

University and a leading force behind DSM's symptom-oriented approach, sees Wakefield's idea as a "major advance in thinking about psychiatric disorders." Spitzer agrees with the Rutgers psychologist that it's often difficult to tell whether a child diagnosed with conduct disorder misbehaves as a result of disturbed brain function.

**D**evelopmental psychologist John E. Richters of NIMH criticizes the assumption that genuine psychiatric conditions reflect disturbances in brain mechanisms that were determined by Stone Age natural selection. Neuroscience research continues to uncover great plasticity in human brain development, a sign of individual flexibility in responding to one's social and physical surroundings, Richters says. In his view, the "openness" of brain design raises doubts about scientists' ability to label with confidence certain mental functions as either natural or dysfunctional.

Children with healthy brains may reasonably adapt to features of their lives by behavior patterns that nonetheless satisfy criteria for psychiatric disorders, Richters proposes. For example, constant exposure to such evolutionarily novel stimuli as rapid-fire images on television shows and in computer games, as well as demands from

toddlerhood on that a child sit patiently for hours at a time and learn abstract information in classrooms, may influence brain development in ways that render some children highly impulsive and distractible.

Researchers need to refocus their energy on identifying what may turn out to be diverse clusters of biological influences and social experiences that push kids toward a common diagnosis such as conduct disorder, Richters contends (SN: 6/7/97, p. 356). There's currently no way to tell whether the proverbial "at-risk" child who skips school, steals, and hangs out with a gang really suffers from an enduring psychiatric condition that will haunt him or her throughout adulthood, the NIMH researcher says.

In fact, the vast majority of teenagers in industrialized societies engage in at least a few delinquent acts without going on to a life of crime (SN: 4/15/95, p. 232).

The unpredictability of development for even the most aggressive youngsters has particular poignancy for Richters. As he puts it, "I now make my living studying what I once was."

Richters grew up thumbing his nose at authority and learning the ropes of street crime. His misbehavior caused him to be thrown out of ninth grade at three different public schools. Dropping out of school left him with more time for burglaries, car

thefts, muggings, and drug dealing. As a teenager, he was forcibly committed to a state psychiatric hospital for a month and repeatedly ended up in jail for short stays. Richters' criminal activities eventually earned him an adult felony record.

"I met reasonable criteria for psychopathology at that time," he says.

He later earned a high school equivalency degree and entered the University of Hartford at age 29. With the help of the university's president, who became his mentor, Richters flourished in academia. His felony record was officially taken off the books in 1987.

Richters now coordinates federally funded investigations of childhood antisocial behavior and conducts his own research in this area.

Perhaps investigators of childhood psychiatric disorders will, in a collective emulation of Richters' inspiring turnaround, transform their field. Psychologist Richard M. Lerner of Boston College, a member of the NIMH-sponsored editors' group, hopes so.

"We need to promote the legitimacy of supplementary research methods that look at how behavior develops in real-world settings," Lerner says. "Quantitative analyses by themselves distort the complexity of life and can't be readily used by policy makers." □

## Earth Science

### Great earthquake shakes off theories

On March 25, the world's largest earthquake in 4 years rattled the ocean bottom between Antarctica and Australia, a region so remote that the tremor went unfelt except by nearby penguins and other wildlife. The great quake, which measured magnitude 8.2, has stymied seismologists who are trying to understand why a normally stable patch of the seafloor turned so trembly.

"It's really kind of a befuddling earthquake because it seems to violate a lot of the usual rules," says Douglas A. Wiens, a seismologist at Washington University in St. Louis.

Most giant earthquakes occur in distinct seismic zones, where two of Earth's surface plates scrape against each other. The March quake, however, struck within the Antarctic plate nearly 350 kilometers from the nearest border with another plate, says Wiens. Seismologists call these sorts of events intraplate earthquakes. The recent tremor was the largest intraplate quake ever recorded in the oceans, Wiens and colleagues report in the July 28 *Eos*, a publication of the American Geophysical Union.

The researchers raise a number of possible theories to explain the quake, but "none of the ideas are really that attractive," says Wiens. Some intraplate earthquakes occur because the ocean crust cools as it ages, but this process hadn't produced such a large tremor in the past. Researchers have identified other intraplate quakes as delayed after-effects of the last ice age; when the glaciers melted, the formerly weighed-down crust rebounded upward and put stress on the ocean floor. Wiens, however, rejects this idea because the March quake hit some 400 km north of Antarctica, a long way from the area that was depressed during the last ice age.

Compounding the mystery, seismic records show no evidence of any other earthquakes in the region going back to the 1960s.

Answers could come from more detailed studies of the seis-

mic waves that crisscrossed the globe after the March quake, says Wiens. Researchers would like to send a ship to the region to probe the seafloor and set down temporary seismometers to record aftershocks, but the chances of getting to such a remote location are slim.

—R.M.

### Cars crossing the Pacific

Thousands of toy cars and party balloons are currently floating across the Pacific Ocean and should wash up on North American shores just in time to celebrate the turn of the millennium, according to an oceanographer who tracks the path of flotsam around the world.

In his newsletter, *BEACHCOMBERS' ALERT*, Curtis C. Ebbesmeyer reports that a hundred thousand miniature cars and a million balloons fell off a cargo ship south of Japan last January. Ebbesmeyer, an oceanographic consultant with Evans-Hamilton of Seattle, teamed up with W. James Ingraham Jr. of the National Oceanic and Atmospheric Administration in Seattle to investigate the fate of these objects. Ingraham used a computer model of winds and ocean currents to forecast where these pieces will head if they remain afloat. According to the simulation, the objects should drift almost due east across the ocean, reaching Oregon, Washington, and British Columbia by January of the year 2000.

Ebbesmeyer and Ingraham have previously had success predicting the movements of sneakers, plastic bathtub toys, and hockey gloves that floated across parts of the Pacific. They've also had failures, notes Ebbesmeyer. In 1996, the University of Washington in Seattle lost an unmanned research submersible at sea and turned to Ebbesmeyer and Ingraham for help. The oceanographers modeled where the sub might go, but it was never found, he says.

—R.M.