

tarded, often autistic; six out of seven are males. Most excel at "right-brained" activities, such as music and art. Other savants are "left-brained" mathematical wizards or "lightning calculators" who can, for example, instantly determine whether Christmas fell on a Sunday in 1654.

Researchers for more than a century have sought the causes of this rare endowment of gift and affliction—without great success. Recently, says Treffert, Harvard neurologists Norman Geschwind and Albert Galaburda have made a number of promising discoveries.

Studying the brain's development in the fetus, they found that the formation of neurons suddenly accelerates during the 10th through 18th weeks of prenatal life. Just before birth, all the neurons that have failed to link up with others die off in a "mass extinction." And, significantly, the right hemisphere of the brain matures before the left hemisphere. So it may be that

an injury to the left side during the formative stage may spark a "migration" of neurons to the more "creative" right side, thus strengthening its functioning.

The Harvard scientists also found that high levels of the male hormone testosterone in the fetus impair the creation of neurons. Thus, an abnormally large dose of testosterone, arriving in the fetal brain after the right hemisphere has completed its development but before the left hemisphere has, may explain why most savants are males and "right-brained."

Even if the Harvard research ultimately solves most of the riddles of savant syndrome—some people have become savants because of brain injuries *after* birth—it will not help the savants themselves. Their treatment is a vexing problem. Often, says Treffert, simple therapy to improve their mental abilities mysteriously diminishes their unique gifts—a curious "cure" indeed.

Fixing Nuclear Power

"Making Nuclear Power Work: Lessons from Around the World" by Kent Hansen, Dietmar Winje, Eric Beckjors, Elias Gyftopoulos, Michael Golay, and Richard Lester, in *Technology Review* (Feb.-March 1989), M.I.T., Cambridge, Mass. 02139.

The ailing U.S. nuclear power industry, which provides 19 percent of the nation's electricity, has one of the poorest records of operating efficiency in the world. Utility executives blame overzealous government regulators and the public's anti-nuclear "hysteria." The authors, a consortium of nuclear engineers, say that utility managers themselves are largely to blame.

Between 1975 and 1984, they found, "the best [managed] U.S. reactors performed as well as any of their counterparts abroad. But the worst did significantly worse." Overall, the nation's 52 pressurized water reactors (the most common type) were "on line" only 60 percent of the time during 1984: The rates were 89 percent in Switzerland; 83 percent in West Germany; 82 percent in France; 73 percent in Japan; and 67 percent in Sweden. Each percentage point of lost capacity can cost \$10 million in replacement power.

Nuclear industries everywhere have

stumbled in the past—Japan's reactors operated at only 35 percent efficiency in 1979—but all, except that of the United States, have improved performance during the 1980s.

Overcautious officials of the U.S. Nuclear Regulatory Commission do deserve part of the blame. U.S. reactors lost an average of 10 percentage points of capacity to "regulatory" shutdowns over the years, far more than those of other nations. But differences in accounting methods exaggerate the burden, the authors argue.

Rate regulation also hurts. Overseas, nuclear power is cheaper than electricity generated from fossil fuels, so utilities are relatively free to set their own prices. In the United States, where cheap coal keeps electricity prices low, state regulators pressure utilities to keep costs down, often to the detriment of long-term efficiency.

Overall, U.S. utility managers and regulators hurt each other in ways unimagin-

able abroad. And nuclear power specialists in other countries are "baffled" by the U.S. utilities' reluctance, until recently, to cooperate among themselves to exchange in-

formation, improve equipment, and assess performance. If the U.S. nuclear industry is to succeed, the authors believe, the worst must learn from the best.

RESOURCES & ENVIRONMENT

The Desert Doesn't Grow

"The Myth of the Marching Desert" by Bill Forse, in *The New Scientist* (Feb. 4, 1989), Oakfield House, 35 Perrymount Rd. Haywards Heath, West Sussex RH 16 3DH, England.

The headlines warn that the world's deserts are growing at an alarming rate, burying farms, forests, and pastureland in drifting sand. A third of the planet's surface is at risk, according to Mostafa Tolba, director of the United Nations Environment Program (UNEP), and 850 million people stand to lose their land. In Africa's Sahel region, the Sahara is said to have pushed 60 miles south during the last 20 years. Needed, says UNEP, is a \$4.5 billion international preventive effort.

Wrong on two counts, contends Forse, a writer for the *New Scientist*. The UNEP estimates of "desertification" are based on a poorly designed questionnaire sent to African governments in 1982, a time of extraordinary drought. "There is extremely little evidence based on field research or remote [satellite] sensing for the many statements about the extent of desertifi-

cation," says Ridley Nelson of the World Bank.

Satellite pictures of the Sahara taken during the 1980s depict a fluctuating desert border that changed in accordance with normal variations in rainfall. From 1982 to 1984, the desert did creep south. But during the next three years it retreated as rainfall returned to normal levels. A Swedish study of the Sudan concluded that "the creation of desert-like conditions seemed to occur mainly in drought periods." When the rains resumed, farm "productivity recovered."

The tragedy, says Forse, is that poor countries such as Mali have wasted precious dollars to create "greenbelts" against an illusory threat. The money would be better spent on temporary food aid during droughts and research to improve farm methods in desert borderlands.

Recycling Plastic

"Solid Waste Concerns Spur Plastic Recycling Efforts" by Ann M. Thayer, in *Chemical & Engineering News* (Jan. 30, 1989), P.O. Box 28597, Central Station, Washington, D.C. 20005.

America's "garbage crisis" is lending new urgency to efforts to recycle newspapers, bottles, aluminum cans, plastic, and other municipal solid wastes.

Today, the United States generates about 320 billion pounds of such wastes annually, reports *Chemical & Engineering News's* Thayer, of which 85 percent is simply dumped into landfills. Because about one third of these landfills are scheduled to shut down during the next five years,

many more localities are going to have trouble getting rid of their trash—at least at a reasonable cost.

Only 10 percent of America's trash is now recycled: 30 percent of all aluminum, 20 percent of all paper. Bottles, wrappers, cups, and other plastic products account for 30 percent of the nation's solid waste, in terms of volume (or seven percent by weight), yet only one percent of plastic is reclaimed.