

THE JUNK-FOOD SYNDROME

BY JEFFREY BLAND

His parents and teachers described 12-year-old Tracy as a highly excitable boy whose schoolwork was failing. Tracy displayed little self-control, had recurring bad dreams, and complained of constant stomach pains and fatigue. Since age 10, Tracy had become increasingly combative; he constantly started arguments at home and at school.

After giving Tracy a comprehensive physical, a pediatrician found nothing medically wrong with him. Although the boy displayed some symptoms of hyperactivity, the doctor doubted that was the problem. Constipation, muscle pain, and lethargy, for example, are not typical of hyperactivity. Most important, aggressive behavior is also atypical; hyperactivity is marked mostly by an inability to concentrate. The pediatrician finally suggested that the boy might be suffering from a recently discovered "overconsumption-undernutrition" syndrome.

The disorder has been traced to a diet of empty-calorie foods. Children who are abnormally aggressive frequently eat too many calories in relation to the micronutrients—mainly vitamins and minerals—they consume. These micronutrients are essential for the proper metabolism of calories in the body and brain.

Junk food has, of course, been blamed for all manner of ills. The new evidence does show that without a proper ratio between key vitamins and minerals on the one hand and calories on the other, brain function and behavior may be disturbed. The basic chemical reactions on which the brain depends, such as the synthesis of neurotransmitters that carry messages between brain cells, require energy. To convert the glucose it receives from the blood into energy, the brain needs the right proportion of other nutrients, such as vitamins and minerals. We can observe the deficit by analyzing the "meta-

bolic debris" in blood and urine samples, chemical by-products that have not gone through the alterations to produce energy. Many by-products, such as lactic acid and pyruvic acid, seem to have direct, adverse effects on the brain. In addition, since the biochemical chain has been broken, the brain receives too little energy to operate normally, resulting in aggression and other symptoms.

When Tracy's pediatrician referred him to our laboratory for a nu-



tritional evaluation, we found that his diet was full of empty calories: sugared cereal, chocolate milk, pie, soft drinks, cookies. Urine and blood tests pinpointed several areas of nutritional deficiency, particularly in B vitamins. We advised Tracy's parents to eliminate candy, doughnuts, and ice cream from his diet, and to add more vitamin- and mineral-rich foods such as fruit, hard-boiled eggs, and whole-grain products. They also gave him B-vitamin supplement pills daily.

Within three weeks, Tracy had improved markedly in several ways. New tests showed he no longer suffered from the chronic nutritional inadequacies we had found earlier. His schoolwork improved and his

random aggressiveness virtually disappeared.

The screening and diet program we used with Tracy is based on recent findings by clinical biochemist Raymond Shamberger and pediatrician Derrick Lonsdale of the Cleveland Clinic. They studied 20 patients with symptoms such as chronic fatigue, sleeplessness, and aggression, who had not responded to conventional medical treatments. Most had eating habits that included large amounts of sweets; all were found to suffer from a chronic B₁ (thiamine) deficiency too small to show up on standard medical evaluations. When they went on diets rich in B₁, their symptoms cleared up.

Another bit of direct evidence for a link between aggression and undernutrition comes from the work of psychiatrist José Yaryura-Tobias, research director at the North Nassau Mental Health Center in Manhasset, New York. Yaryura-Tobias found that many patients who had a record of inexplicable episodes of unprovoked violence needed more than the normal levels of B₃ and B₆ to metabolize tryptophan, an amino acid the brain uses to synthesize serotonin, an important neurotransmitter. When they took extra B₃ and B₆, their violent episodes virtually disappeared.

Obviously not all human aggression is explained by diet. It does appear, however, that some abnormal behavior may depend on eating habits that upset delicate biochemical balances in the brain. As methods of detecting essential nutrients in the body become more routine, we should be able to identify people with chronic deficiencies and help them change their diet—thus ameliorating problems that could not be cured by other therapies. □

Jeffrey Bland is professor of nutritional biochemistry at the University of Puget Sound and director of the Bellevue-Redmond Medical Laboratory in Bellevue, Washington.