nately fed specially prepared cookies and candy bars that either contained synthetic colors or strictly natural components. "Feingold had said that even a small deviation from his diet would set a child off and the youngster would revert back to hyperactive behavior, Harley says. "So we challenged the youngsters with artificial foods to see if we could indeed turn such behavior on and off."

The follow-up showed no such "on-off" effect, the youngsters remained essentially unchanged by diet, the researchers report. One child did show some signs of reacting to the manipulation, but Harley says even that case was "not entirely consistent with the expectations," Feingold indicated. In any case, Harley adds, "we're talking about 1 child in 46" who showed signs of being altered by diet.

Feingold disputes the Wisconsin group's conclusions more than its findings. "Their study is actually very strongly supportive [of his theory], even though they [the Wisconsin team] tried to discredit it," he told SCIENCE NEWS. The favorable parents rating of the preschoolers indicates that diet *does* influence hyperactivity, he says. "The issue is 'Does it occur ?'" Feingold says. "That's all we want—we're not debating the statistics, because the statistical evaluation has no meaning at all." The final statistics are flawed, Feingold asserts, because the Wisconsin design was faulty and did not control the youngsters' food supply outside the home. "These [hyperactive] children are notorious liars," he says. In all likelihood, many of the test subjects exchanged food with peers at school, he suggests. "With this lack of control of food supply, it's remarkable they got any [indications that diet affects hyperactivity] at all."

Harley replies that the team "did the best job possible of maintaining control of the diet, short of having the youngsters in a locked ward." And he adds that the parents' questionnaires indicated that the children adhered to the diets and, in fact, "got off on" participating in the study.

"We're not saying that no kids respond to the diet—and our results indicate that maybe we should start looking more at preschool youngsters in this regard [of possible dietary effect]," he says. "But it [the effect of additives] is definitely not of the degree and magnitude that Feingold has been talking about." □

New way to detect variant hemoglobins

More than 275 different hemoglobin variants have been identified in humans, most of which are due to the substitution of a single amino acid in one of the two polypeptide chains that constitute the hemoglobin protein. Although most of these hemoglobin mutants are rare and innocuous, a handful are common and pathological. The most infamous is the S hemoglobin variant. Its amino acid replacement at position six in the beta polypeptide chain makes it clump and disrupt blood cells so that they become sickle-shaped. The result is sickle cell anemia.

Although techniques such as chromatography and electrophoresis can separate out hemoglobin variants and purify them to a large degree, positive identification of such variants can come only from detailed structural analyses. Such a three-step pathway toward identification not only is time-consuming but also requires an ample amount of purified hemoglobin. Now an equally specific but easier route to identifying pathological hemoglobins has been devised. It is radioimmunoassay.

Fred A. Garver and his colleagues at the Medical College of Georgia in Augusta first took blood samples from patients whose abnormal hemoglobins had already been identified by chromatography, electrophoresis and ultimately structural analysis. They subjected the blood samples to column chromatography, which separated hemoglobin from other components in the blood, and then to gel electrophoresis, whereby purified hemoglobin migrated in the gel column as single bands.

Extracting the purified hemoglobins, they injected them into rabbits or chickens. The animals made antibodies (antisera) to the hemoglobins. The researchers then evaluated the feasibility of using the antisera from the animals as a radioimmunoassay to identify abnormal hemoglobins in red blood cell hemolyzates (preparations resulting from the destruction of red cells). They found that each antiserum was able to distinguish a particular hemoglobin variant by recognizing its single amino acid substitution and that each ignored normal hemoglobins or hemoglobin variants containing other amino acid exchanges. In other words, the radioimmunoassay they devised is a sensitive and specific test for various hemoglobin variants. Still another bonus is that the assay can measure the amounts of hemoglobin deviants present in blood hemolyzates in quantities as low as one percent of the deviant. Their evidence also suggests that the assay can be used on newborn as well as adult blood. They believe that the test may likewise work on blood drawn from fetuses by amniocentesis.

As the researchers explain in the June 17 SCIENCE, an immunochemical method for identifying and measuring pathological hemoglobins offers certain advantages over current methods. Because three different techniques — chromatography, electrophoresis and structural analysis—must be currently conducted to conclusively identify a hemoglobin variant, radioimmunoassay, being one technique, should be easier and quicker. Still another advantage of radioimmunoassay is that only tiny amounts of red cell hemolyzates are needed for hemoglobin measurement, compared with the large amounts of purified hemoglobin required for hemoglobin structural analyses.

"These features appear to make the radioimmunoassay of considerable importance in the analyses of hemoglobin variants," they conclude. □

Wernher von Braun: 1912-1977


NASA

A dreamer, an engineer and a pioneer have died. Their name was Wernher von Braun. Born in Wirsitz, Germany, on March 23, 1912, the man chiefly responsible for both the V-2 weapon and the rocket that sent men to the moon passed away on June 16 after an extended bout with cancer.

His father, Baron Magnus von Braun, was a Prussian aristocrat who went on to become secretary of agriculture in the Weimar Republic. His mother, however, was an amateur astronomer, avid enough that as a confirmation gift she presented young Wernher with a telescope. His interest in space—perhaps the seeds of his career—were further developed when he read a book by early rocket researcher Hermann Oberth on the subject of rockets as interplanetary propulsion.

Even at the height of the German war effort, for which von Braun's group developed the devastating V-2 ballistic missile, his interest in space showed through. Following a successful test of the V-2 in October of 1942, he is reported to have said, "Today, the spaceship was born."

Von Braun and about 120 of his colleagues surrendered to the Allies in 1945, coming to the United States that September to begin work on a succession of missiles that led to the development of the Jupiter-C. After Sputnik 1 shook the world in 1957, von Braun headed an 84-day crash program in which a Jupiter-C became the first rocket to successfully carry a U.S. satellite—Explorer 1—into orbit, on Jan. 31, 1958. That September, design work began on the Saturn series of rockets that would ultimately blaze the trail to the moon. Von Braun's death came only two days before the successor to the Saturns—the space shuttle—carried human beings for the first time (though the craft was carried by the jet aircraft to which it was attached) in a successful test in California.

July 20, 1969, only minutes after Neil Armstrong had descended from the Apollo 11 lunar module to make the first human impressions on the surface of the moon: "Do you know whose footprints those are?" asked a high-ranking Apollo official. "Wernher von Braun's." □