Fiftieth search honors student scientists

One young researcher cultivated metal-enriched seaweed in his garage to make methane; another found a correlation between the number of calories her classmates consumed and their stress levels before taking school tests. A fledgling computer scientist who loves baseball modeled the effects of spin and air drag on the ball's trajectory. These student scientists are among the 40 finalists in the 50th annual Science Talent Search, a nationwide competition designed to identify, encourage and honor budding talent in science, mathematics and engineering.

Selected from among 1,573 high school seniors who entered the competition, the finalists completed projects in a diverse range of fields, including mathematics, behavioral science, chemistry, nutrition and physics. Some went to research laboratories, stayed by their computers, visited children's play groups or ventured to the seashore to conduct their scientific inquiries. One finalist studied the importance of friendships in the well-being of nursing-home patients, another examined number theory, and a third used sun-blocking agents to help develop a tough, weatherproof varnish.

The students, 17 females and 23 males, will gather in Washington, D.C., on Feb. 28 for a five-day, all-expenses-paid visit, where they will compete for a total of $205,000 in science scholarships. Through a series of interviews, a board of judges will select 10 top winners to receive four-year scholarships, which range from $10,000 to $40,000. Each of the remaining 30 will receive a $1,000 scholarship. All finalists will have the opportunity to talk with scientists in the area.

The talent search is sponsored by Westinghouse Electric Corp. and administered by Science Service, Inc.

This year's finalists, aged 15 to 18, will display their research projects to the public on March 2 and 3 at the Washington Hilton Hotel in Washington, D.C.

The 40 winners are:

ALABAMA: Mehul Vipul Mankad, St. Paul's Episcopal School, Mobile; Weily Soong, Vestavia Hills H.S., Vestavia Hills.

CALIFORNIA: Wei-Jen Jerry Shan, John W. North H.S., Riverside; Rageshree Ramachandran, Rio Americano H.S., Sacramento; Tessa Lorrell Walters, San Gabriel H.S., San Gabriel.

COLORADO: Mark Allen Larson, Horizon Sr. H.S., Brighton.

CONNECTICUT: Don H. Kim, Greenwich H.S., Greenwich.

DISTRICT OF COLUMBIA: Joel Ellis Moore, St. Albans School.

FLORIDA: Clifford Lee Wang, Vero Beach H.S., Vero Beach.

ILLINOIS: Joseph Izak Seeger, Evanston Township H.S., Evanston; Irwin Lee, Naperville North H.S., Naperville.

IOWA: Nupur Ghoshal, Ames H.S., Ames.

MICHIGAN: Lori Ann Stec, Detroit Country Day School, Birmingham.

NEBRASKA: Kimberly Ann Chapman, Marian H.S., Omaha.

NEW JERSEY: Denis Alexandrovich Lazarev, Elmwood Park Memorial Jr.-Sr. H.S., Elmwood Park; Dean Ramsey Chung, Mountain Lakes H.S., Mountain Lakes; Stanley Lu, Bridgewater-Raritan H.S. West, Raritan.

NEW MEXICO: Cameron Rea Haight, Santa Fe H.S., Santa Fe.

NEW YORK: Cheryl Lynn Pederson, Byram Hills H.S., Armonk; Jim Way Cheung, Bronx H.S. of Science, New York City; Ciamac Moallemi, Benjamin N. Cardozo H.S., New York City; Ani Jean-Mee Fleisig, Nuri Mehmet Kodaman, Townsend Harris H.S., New York City; William Ching, Riverdale Country School, New York City; Tara Sophia Bahna-James, La Guardia H.S. of Music and the Arts, New York City; Petal Pearl Haynes, Yves Jude Jeanty, Linda Tae-Ryung Kang, Sunmee Louise Kim, Debby Ann Lin, Tien-An Yang, Stuyvesant H.S., New York City; Michael John Lopez, Ward Melville H.S., Setauket.

NORTH CAROLINA: Ashley Melia Reiter, North Carolina School of Science and Mathematics, Durham.

OHIO: Jeremy Randall Riddell, The Miami Valley School, Dayton.

PENNSYLVANIA: Susan Elaine Criss, Fox Chapel Area H.S., Pittsburgh.

TEXAS: Wade William Butin, Klein H.S., Spring.

VIRGINIA: Judson Lawrence Berkey, Venkataramana Kuntimaddi Sadananda, Daniel Moshe Skovronsky, Thomas Jefferson H.S. for Science and Technology, Alexandria; Tatiana Tamara Schnur, Robinson Secondary School, Fairfax.

Antibody treatment joins AIDS battle

Antibody injections can help stave off severe bacterial diseases in some children infected with the AIDS virus (HIV), a new study shows.

Because children's immune systems have yet to reach full potency, HIV — which weakens immunity — leaves them especially vulnerable to bacterial infections such as pneumonia and meningitis. Noting that physicians already prescribe classes of antibodies known as immunoglobulins for other immune deficiencies, researchers reasoned that the same treatment might help HIV-infected children fight these life-threatening secondary infections.

Although the immunoglobulin injections did not improve children's chances of surviving through the entire 2½-year study, they did reduce the number of hospital stays among the children with less severe HIV infections, reports study director Anne D. Willoughby of the National Institute of Child Health and Human Development. She and her colleagues announced the results at a press conference last week.

The study involved 372 children, 2 months to 12 years of age, at 28 medical centers across the United States. All showed immunologic or clinical symptoms of HIV infection when the study began, and some met diagnostic criteria for AIDS. About half received monthly intravenous injections of purified immunoglobulins (400 milligrams per kilogram of body weight) obtained from healthy adult donors.

To gauge the severity of HIV infection, investigators measured blood levels of white cells called CD4 lymphocytes, which decline as the infection progresses. Among children whose CD4 counts exceeded 200 at the study's beginning, 68 percent of the immunoglobulin-treated group escaped serious bacterial infections for two straight years, compared with 48 percent of the placebo group, Willoughby says. The injections did not appear to help children with CD4 counts below 200.

During the study, many children began taking the antiviral drug AZT to combat HIV or antibiotics to treat bacterial infections, but Willoughby says this did not interfere with the interpretation of the results.

Scientists have no indication that the treatment can boost immunity in HIV-infected adults. Children may benefit from the injections because their immune systems lack reserves of antibody-producing cells. A child's immune system "needs to go to school in a sense," explains William T. Shearer, a pediatric immunologist at the Texas Children's Hospital in Houston.

In a separate study of children with symptomatic HIV infection, researchers led by Philip A. Pizzo of the National Cancer Institute focused on ddI, an experimental drug that targets the virus. They report in the Jan. 17 NEW ENGLAND JOURNAL OF MEDICINE that ddI appears safe and shows "promising" anti-HIV activity in children. They note, however, that its stability in the stomach varied greatly from one child to the next, making dosage requirements tricky to determine. Physicians will need to monitor patients' blood levels of ddI and adjust dosage accordingly, the researchers conclude. — *W. Gibbons*