

GENERAL SCIENCE

Winning Science Projects

Studies on the applications of iron magnetism, psychological problems, cellular behavior and mathematical theories are among projects of Science Talent Search winners.

► **IRON MAGNETISM** was studied by Henry Lester, 17, a Teaneck (N. J.) High School senior, and Joseph Goodbread, 16, a senior at Jamaica (N. Y.) High School. Their research has gained for these young scientists berths in the winners group of the Science Talent Search. Henry and Joe will join 38 other boys and girls at the Science Talent Institute in Washington from Feb. 27 through March 4.

Henry, a former first award winner in the National Science Fair-International, presents a new system of information transfer by impressing this information on some characteristic of a high-frequency carrier signal. He utilized the magnetic and electrical properties of recently developed iron compounds called ferrites. His completed system has several advantages over amplitude and frequency modulation for microwave transmission.

Works With Iron "Whiskers"

Joe reports that when long, thin, perfect crystals of iron, called whiskers, are subjected to a magnetic field, they reverse their magnetization by nucleating a domain wall, or boundary separating two regions of opposite magnetization that sweeps down the length of the whisker. Joe observed this phenomenon with apparatus of his own design and discovered several new effects that could be used in the building of a computing system.

Henry, the son of German immigrants, plans to study physics at Harvard while Joe will study either biophysics or biochemistry at Princeton. Both boys anticipate many happy years in scientific research.

A California girl who plans to become an experimental psychologist and a Florida boy planning a life of pure research have turned their scientific hobbies into tickets to the nation's capital by placing among the 40 winners.

Anita Ware, Eisenhower High School senior from Rialto, Calif., and Mark Weiss, a senior at Coral Gables Senior High School in Florida, will join 38 other outstanding young scientists at the Science Talent Institute in Washington where they will tour scientific facilities, meet top scientists and compete for \$34,250 in Westinghouse Science Scholarships and Awards.

Formation of a social bond in the very early life of an individual which determines future social responses has been considered by most experimenters to be a visual imprint, with sound as a contributing factor not in itself capable of imprinting response. Anita attempted to show that it is possible to effect an auditory imprint in chicks with no visual experience. She used a tape

recorder with a "gock, gock, gock" sound on two groups of chicks. The control group had the usual visual experiences, while the test group had been hatched in the dark and had no visual experience. She found that none of the control group followed the imprint sound, while 75% of the test group showed that they definitely had been imprinted—enough to prove Anita's point that sound is capable of imprinting a response.

Studies Cell Respiration

Meanwhile, Mark had heard that red light has been found to slow down the rate of respiration in certain animal cells, while white light speeds up the process. Not content to settle for a bit of information, Mark took it as a signal to further experimentation. Mark does not report definite results, but he does believe lower respiration rate could prevent split chromosomes from rejoining, and could be the way in which seed germination and plant flowering are controlled.

Anita and Mark are 17. Anita hopes to attend Pomona College while Mark's plans call for entering Princeton next fall.

Prime numbers, logic systems and geometric topics have helped three boys achieve status as winners in the Science Talent Search.

Norman Friedman, 16, is a senior at Bronx High School of Science in New York City, and has developed a general theory to determine by simple analysis the inherent possibilities of a mathematical sys-

tem (a set of postulates plus theorems that can be proved if the postulates are accepted). The theory is developed as a series of transformations of the postulates.

Joseph Neisendorfer, 17, a senior in Chicago's Tilden Technical High School, has studied minimal points (lattice points with integral coordinates) that have a special relationship to convex bodies. His final theorem establishes a definite relationship between the eccentricity of convex bodies and minimal points.

David Zalkind, 17, a Wakefield High School senior in Arlington, Va., developed a method of mathematical sieving with application to prime numbers. The sieving method yields sets of numbers with similar properties. His purpose, David said, was to find which of these sets contain an infinite number of elements, and which only a finite number of elements.

The three boys plan to major in mathematics in college next year, Norman at Harvard, Joe at Notre Dame, and David at either Harvard or Princeton.

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BOTANY

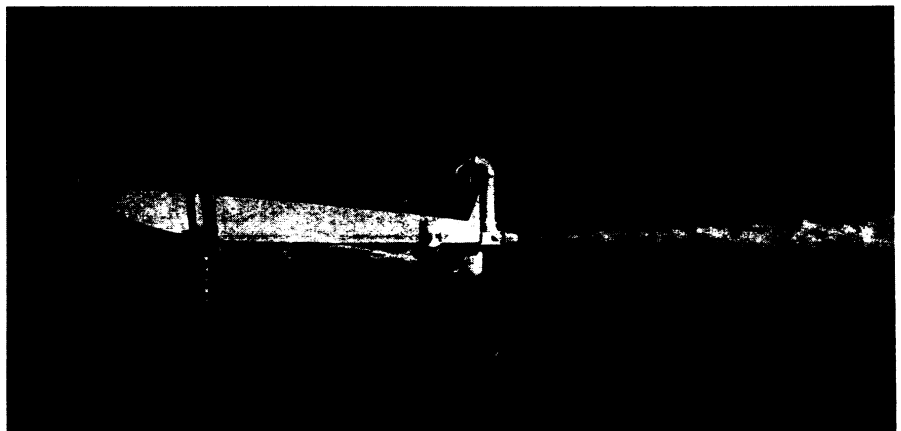
Cut Flowers Sprayed With Gas Last Longer

► **CUT FLOWERS** may last longer by treating them with ethylene oxide gas.

Cut roses delayed opening their buds as long as 70 hours after this treatment, the U. S. Department of Agriculture has found. Normally, untreated rosebuds are completely open within 40 hours.

Beneficial side effects included better color and a longer period of open petals for the treated flowers.

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Boeing Company

"LITTLE SQUIRT"—A two-and-one-half-ton experimental hydrofoil boat, known as the "Little Squirt," made by the Boeing Company, Seattle, is shown here being pushed by a 30-ft. stream of water on Seattle's Lake Washington. The water jet is pumped up through the foil system and exhausted over the stern, propelling the craft above the surface.