

GENERAL SCIENCE

# Pick Top STS Winners

Frederick Greenleaf of Allentown, Pa., received \$2,800 grand award of the Science Talent Search. Kathleen Hable of Loyal, Wis., won the \$2,000 scholarship.

## See Front Cover

➤ A 17-YEAR-OLD Pennsylvania high school senior, who is solving an old chemical problem brought up to date by the atomic age, was named grand winner of the Fourteenth Annual Science Talent Search in Washington.

Frederick Paul Greenleaf of Allentown High School, Allentown, Pa., received the \$2,800 Westinghouse Grand Scholarship. Runner-up for the top award and recipient of a \$2,000 scholarship was Kathleen Anne Hable, 18, of Loyal, Wis., attending Columbus High School, Marshfield, Wis., who conducted studies in heredity. Both are pictured on the front cover this week's SCIENCE NEWS LETTER.

The winners of the Science Talent Search, which is administered by SCIENCE SERVICE through Science Clubs of America, were announced at an awards banquet, following an address by Donald A. Quarles, assistant secretary of defense. The banquet culminated a five-day competition among 40 young high school seniors from 17 states.

The 40 teen-agers, picked from 2,575 entries of other students throughout the nation, were brought to Washington to take part in the Science Talent Institute and to compete for the scholarships, provided by the Westinghouse Educational Foundation.

The young Pennsylvania scientist took first place with a project in which he is developing a method to isolate rare earth metals more cheaply and more efficiently than is now practiced. He has developed a method of distillation separation that may lead to new horizons for industry.

Rare earth metals, such as samarium and europium, have long remained a mystery, simply because there was not enough of them available to find out what they could be used for. The coming of atomic reactors has meant that more and more rare earth metals are now being produced as fission by-products.

Frederick discovered that present methods of separating the rare earths, which occur together in ore form, are inefficient, expensive and laborious. After much experimentation, he found that an old chemical method of separation, that of distillation, could be effectively and cheaply used to boil off the rare earths one at a time.

He accomplishes this feat by adding an organic compound to the solution of the mixed metals. By slowly heating his "still," the metal with the lowest temperature fractions out of the mixture first, then another rare earth metal, and so on.

The young researcher, who sees the use of his development in other ore refining processes and possibly for atomic energy production, plans to attend Lehigh University and combine studies of electrical engineering with physics. Eventually, he hopes to operate a business of his own doing basic research in chemistry and physics.

Kathleen Hable, who took second honors, made a three-part study of heredity for her scientific project. She bred mice and studied their color inheritance. She followed mutations and Mendel's theories of inheritance in *Drosophila* fruit flies. In the third phase of her study, she charted the family trees of some of her neighbors for specific physical characteristics.

In one family, she traced the eye coloring through three generations. In another, she found 65 persons of both sexes in four generations had inherited the hair-line pattern known as a "widow's peak."

Kathleen's family studies also revealed that while color blindness was handed down from father to son through three generations, harelip occurred in 24 individuals of four generations and was inherited by both males and females.

The daughter of a doctor and registered nurse, the high school scientist hopes to become a doctor of medicine too. She plans to attend Marquette University in the fall.

Eight other finalists received \$400 scholarships and the other 30 received scholarships of \$100 each.

Science News Letter, March 12, 1955

A majority of persons can use alcohol in moderation, but it is believed that the majority of people cannot do the same for opiates.

**PROJECTS EXHIBITED**—Some of the projects of the 40 top competitors for Science Talent Scholarships are demonstrated by these high school scientists.

*Left column, beginning at the top are: Carol Myers, showing her tests with vaccinated mice; Charles Eichman and his paleontological collection; David Fleishbacker, with his project on evolution, and John Stone, showing a low Reynolds number wind tunnel he built.*

*Center column are: Patricia Tate, testing for cholesterol and blood pressure; John MacDonald, delving into fourth-dimensional geometry;*

*Vaughan Aandabl, who placed third in the competition, showing his collection of insects, and Daniel Wilson, with his experiment on the Liedenfrost Effect.*

*Right hand column are: Alice Hartley, testing for acidity; Agris Kalnajs, with his "nim" machine that stumped visitors to the exhibition in a game of numbers; James Havey, Jr., explaining spectral lines, and Stephen Webb, proving a geometrical theorem for curved space.*



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