

GENERAL SCIENCE

Science Fairs Grow Up

In addition to providing public exhibits of students' scientific work, the science fair has become a good means of finding students who will become scientists and engineers.

By SHIRLEY MOORE

► THE SCIENCE FAIR is growing up and is developing the potentials that were an inspired part of its earliest beginnings.

In this Year of the Satellites, some of its bright realities will be spotlighted as fairs all over this country, its possessions, and even in foreign lands send their best high school exhibitors to the National Science Fair in Flint, Mich., May 7 through 10.

A SCIENCE SERVICE study of the progress of the finalists of the eight previous National Science Fairs, now being completed by Margaret E. Patterson, executive secretary of Science Clubs of America, is revealing dramatic evidence of what the fairs actually do accomplish.

One very heartening "proof of the pudding" is evident in the hundreds of former finalists now in college and graduate school, preparing for careers in scientific specialties. Of the undergraduates who responded to Miss Patterson's detailed inquiry, 91.8% are majoring in science or education.

Of the older ones, most of whom have completed their advanced schooling, 52 men and women report assignments in the armed forces or full-time jobs. Of these, 84.6% are in scientific fields or education.

Early Fair Finalist

Dominic B. Edelen, one of the finalists in the first National Science Fair, held in 1950, is a good example of what becomes of the high school scientists honored at the national event. Mr. Edelen, soon to be "Dr. Edelen" as he completes work for his doctorate in mathematics at Johns Hopkins University, is head of the Dynamics Group on Project Vanguard at The Martin Company in Baltimore, Md.

This 25-year-old research mathematician has been responsible for analyzing control problems arising from the complex movements of the satellite launching rockets before and during flight.

Mr. Edelen is also a visiting lecturer at Drexel Institute, Philadelphia, and has published two papers on mathematics. Other papers he has written on missile system analysis are still "classified."

Four years ago, he and Erica von Eschenburg were married, and their son was born the following year. Mrs. Edelen has a B.A. in history and English and has done graduate work in philosophy.

The winning project that Dominic took to the National Science Fair eight years ago was a Van de Graaff generator using an accelerator tube he had improvised. This

exhibit won a third prize in physical science.

His interest since then has ranged through such problems as the fourier heat conduction equation and the elastic wave equations. His doctoral dissertation is "The Extension of the Theory of Canonical Maps for a System of Tensorial Partial Differential Equations Which Arise From the Calculus of Variations in n Independent Variables."

Similarly, the plans and accomplishments of other finalists prove that the hope invested in the science fairs has been fulfilled beyond the most optimistic expectations.

Millions of visitors go to their local fairs with greater understanding now, and they leave with renewed hope for the future of humankind. For science fairs are no longer static exhibitions of collections, models and cardboard posters, but are like colorful laboratories filled with work-in-progress and the cheerful evidence of young minds energetically in motion.

The community science fair is a lively spring tonic to science-mindedness that has become an annual event prepared for and looked forward to by both students and adults. Even the smallest fry are eager fair visitors who stand on tiptoe to look at protozoa through a microscope or listen de-

lightedly to the roar of a tornado vortex model, sensing a little of the fine elation of tracking down truth for oneself.

The great interest in the fairs is reflected in the way they have grown in sheer size. For example, in 1947 seven schools exhibited 14 projects at the Lehigh Valley Science Fair in Allentown, Pa. This fair was visited by 100 students. In April, 1958, 822 top level projects were exhibited to 30,000 visitors. The 822 represented the best of 8,087 projects seen by 40,000 people in 28 preliminary school fairs!

If science fairs accomplished nothing more, observers are convinced that they would be extremely valuable just as a hometown way of keeping everybody in touch with the current work of their schools and educators. There is probably no easier way to catch the contagious excitement of "just being around to watch in 1958," as someone put it, than to listen to neighborhood Bobs and Mary Annes as they demonstrate their science projects on a solar power plant, an experimental rocket design or their first try at research in new plastics. After an evening at a science fair many adults make comments like:

"I've never learned so much so fast . . . this has been a stimulating and humbling experience!"

But the fairs accomplish very much more than this. One of the most important factors mentioned by students and educators is the opportunity for a young person to discover that he can explore and understand



SCIENCE FAIR FINALIST GROWS UP—This is Dominic B. Edelen, finalist in the first National Science Fair in 1950. Now, at 25, he is head of the Dynamics Group on Project Vanguard at The Martin Company in Baltimore, Md., responsible for the complex mathematics of the satellite launching rockets. The model in his hand is the Navy-Martin satellite launching rocket. The tapes are telemetry reports from a recent flight.

for himself, not only what other people have discovered, but also whatever is still hidden in the limitless reaches of what nobody knows.

Benefits of Participation

As a New Jersey science fair administrator put it, "Science fairs encourage an inquiring mind, ingenuity, resourcefulness; provide an outlet for enthusiasm and the craving for activity that yields results; and bring to light qualities and abilities that otherwise might not be discovered."

The science fair gives a young person, his parents, his teacher and all the other people who have advised and encouraged him, the pleasant and stimulating reward of public recognition. A special side of this is described by Mary Ploog Dankleff, who represented the Northeast Iowa Science Fair at the National Science Fair in 1954, now a senior in college and married to an English instructor.

"Science fair recognition on the high school level is one of the few ways by which a girl has an equal opportunity to prove her worth," Mrs. Dankleff said in an interview for an article in the Waterloo Daily Courier on the influence of the science fairs upon the careers of Iowa's winners. "Each time a girl does receive such recognition," she commented, "she widens a bit the opportunities for herself and other women, and she persuades teachers and employers to give her the opportunity to train professionally in the area of science."

Mrs. Dankleff won a four-year scholarship to Iowa State Teachers College, an award from the Iowa State Science Talent Search, and a place on the honor roll at the Iowa Junior Academy of Science science fair. In college she has won membership in national honor societies in mathematics, biological sciences and physical sciences. She will enter graduate school next fall to work toward a Ph.D. in chemistry.

Good Winners and Losers

Participating in science fairs also can teach a young person the somewhat elusive technique of winning and losing well; that is, without undue puffing up or collapse of self-esteem. Teachers and students report that winning has a way of inspiring further trying, often followed by more succeeding. In fact, some students admit frankly that their interest in training for a career in science or technology began when they won a science fair award for a project started "under duress" because it was required by a chemistry, physics or biology teacher. Science fair directors and judges also reminisce about instances when losing showed that a youngster had "what it took," and stimulated him into developing really excellent work habits and attitudes.

Suzan Lynn Hopkins, another Iowa winner and a 1956 National Science Fair finalist, said that although she discovered science and her desire for a career in research through her first science fair project, her decision to go into medical research was not "simply because I happened to be fortunate enough to win first place in the science fair. I would have done so had I received no recognition at all.

"Anyone who enters a science fair hoping to win a prize," said Suzan, "really has a distorted sense of values. The experience and knowledge one gains from working on a project outweighs by far any material awards or recognition he might receive."

Now completing her first year as a pre-medical student at the University of Iowa, Suzan looks forward to a degree in medicine and further graduate work in chemistry.

Teachers and parents say that in planning and putting together a project a student discovers ways of finding answers, through books, magazines, scientific papers and his own experiments, that can enrich all the rest of his life, whatever his eventual career.

Boys and girls also discover that being part of a science fair brings them into contact with other searching minds, both in their own generation and among educators and working scientists. Many a teen-ager, who had felt "different" and lonely in his questioning, has confessed that this is an unexpected and immensely gratifying experience.

Fairs: A Communication Aid

Many students say that continued science fair activity has helped them to find ways of communicating facts, "hunches," and the way they feel about both, to other people. Educators agree that such ability is rather sadly rare among scientists, thinkers of all kinds and even among teachers.

The science fair is one of the best ways anyone has discovered to give students an incentive to work independently on projects they have chosen for themselves, an experience educators feel is really important in the development of a young scientist.

It is pretty obvious that not all, or maybe even many, of the students who go into local science fairs are going to become tomorrow's top level research scientists. An unknown number of them will never be any kind of a scientist, engineer or technologist. But many fair administrators have declared that if even a small percentage of the young exhibitors discover that they want to be scientists, the planning and work that go into the fairs will be richly repaid. Those whose lives travel along other paths will have gained, at the very least, some background for intelligent understanding and choice in a science-based civilization.

Science News Letter, May 3, 1958

ENGINEERING

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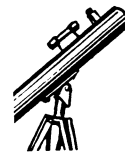
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