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September 3, 1960

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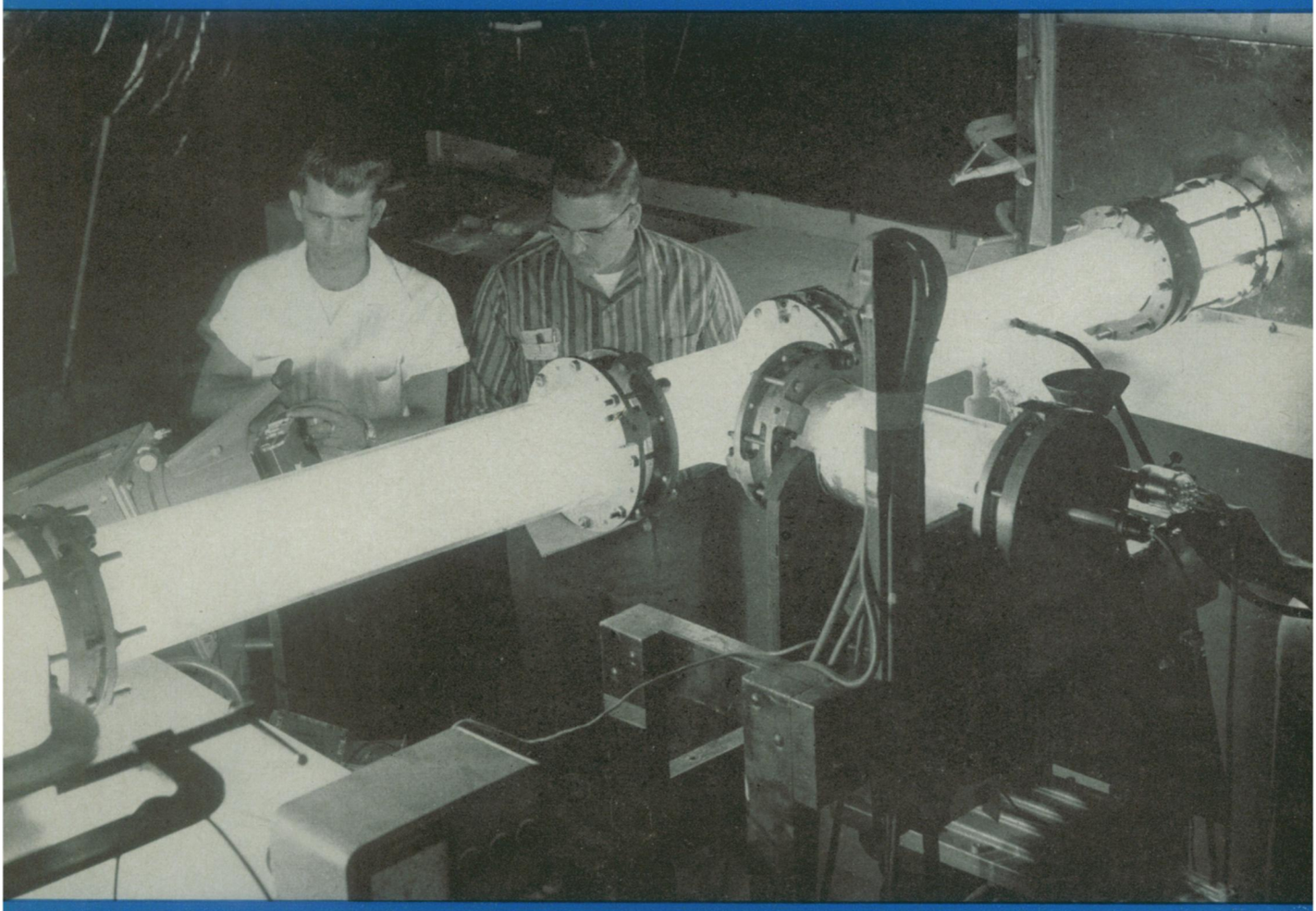
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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Please enter our club for affiliation with Science Clubs of America without charge. Send me as sponsor the free SCA HANDBOOK of educational aids and tested science club techniques. I understand that we shall have the cooperation of the SCA staff in organizing and helping our club conduct interesting and worthwhile activities. Please keep us informed on the National Science Fair-International and the Science Talent Search. (Sponsor must be a science teacher, parent, youth leader or professional scientist.)

Name of Sponsor_____

Profession_____

School or Organization_____

Address_____

City_____ Zone____ State_____

If you do not have a club, and do not plan to form one, you may have a copy of the Handbook by sending your check or money order for $1.00.

Y8004

AFFILIATION

Must be answered for club listing.

My school is:
Elementary ☐
Jr. High School ☐
Sr. High School ☐
Other_____

My club is:
From whole school ☐
From one class ☐
In class time ☐
Other_____

How many club members_____

I teach:
Chemistry ☐ Mathematics ☐
Biology ☐ General Science ☐
Physics ☐ Other_____

Club activities:
Chemistry ☐ Mathematics ☐
Biology ☐ Other_____
Physics ☐ _____

Science Fair in my school: Yes ☐ No ☐

I read Science News Letter: Yes ☐ No ☐

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( ) $_____ enclosed. ( ) Please send bill.

Name_____ Title_____

Address_____

City, Zone, State_____

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Science Youth Program

An extensive national and international movement directed by Science Service stimulates and gives scientific experience to the youth of the world.

MORE THAN 600,000 students are members of some 25,000 groups, largely in high schools, affiliated with Science Clubs of America, a Science Service activity. Any adult, whether science teacher or club leader, can affiliate a science club without charge.

Individual projects and experiments by young scientists are shown in exhibits prepared for the thousands of school science fairs held each spring. The best of the exhibits in high school fairs are selected to compete in more than 200 area and regional fairs which are affiliated with the National Science Fair-International. Each of these fairs sends not more than two of its top exhibitors to the National Science Fair-International, the twelfth of which will be held in Kansas City, Mo., May 10 to 13, 1961. Thousands of professional scientists, engineers and educators advise student scientists on their projects, and panels of these experts serve as judges at local, regional and national fairs.

Science Fair Committees are organized to conduct local and regional science fairs in cooperation with public, private and parochial school systems, colleges, research institutions, industries, professional science, engineering and educational societies, newspapers, civic clubs, museums and other agencies.

The Science Talent Search for the Westinghouse Science Scholarships and Awards, conducted by Science Clubs of America, is the pioneer top-level competition to select from the nation's high school seniors those giving promise of being the creative scientists of tomorrow. Conducted during the fall of 1960 for the 20th time, the Science Talent Search uses a science aptitude test on a nation-wide basis to select over 400 boys and girls for honors. Forty members of this Honors Group are designated Winners and are invited to Washington for a five-day Institute at which $34,250 in scholarships and awards are given.

Through special arrangement with Science Clubs of America, State Science Talent Searches are conducted in 36 states, usually by academies of science or universities.

Records of achievement of Science Talent Search winners over the years show that 100% go to college and about half of those now old enough have earned their doctorates or are about to do so.

Both of these activities, the National Science Fair-International and the Science Talent Search, are approved by the Committee on National Contests and Activities of the National Association of Secondary-School Principals.

As part of the National Science Youth Program, Science Service develops and distributes experimental kits at low cost, books and pamphlets promoting scientific experimentation; provides basic and background information in all fields of science; cooperates with many organizations in their science youth programs. Support from the National Science Foundation and other groups is obtained to materialize and implement mutual objectives in science education, particularly in secondary schools.

Other major activities of Science Service contribute to the National Science Youth Program. Science Service's service to newspapers, reaching a total circulation of over 10,000,000, informs teen-age science enthusiasts as well as the general public. SCIENCE NEWS LETTER with a growing circulation of over 70,000 reaches a select audience of non-scientists and scientists alike, including a great many students, science teachers, college professors and research scientists.

THINGS of science, experimental kits containing unusual specimens or explaining experimentally processes through which a familiar product passes, have been issued monthly for 20 years. Now being produced at 30,000 a month, these kits have introduced many young people to the joys and techniques of science experimentation. CHEMISTRY, issued monthly during the school year, brings particularly to high school teachers the latest in its important field.

"October—National Science Youth Month" was inaugurated and sponsored by Science Service as a means of catalyzing the beginning of science youth activities during the school year and enlisting the cooperation of diverse organizations engaged in science youth activities.

Science Service, 1719 N Street, N.W., Washington 6, D. C., invites the cooperation of organizations and individuals in extending science youth activities, particularly in regions where science fairs and clubs are not yet developed.

Information and suggestions will be furnished upon inquiry to Science Service.

Science Clubs of America

Active groups of young scientists, guided by sponsors to creative experiment, find that "science is fun." Today's youth are tomorrow's scientists.

APPROXIMATELY 25,000 science clubs are affiliated with Science Clubs of America. A current evaluation shows that there are active science clubs at all grade levels, although the largest number are organized on a school-wide basis in senior high schools.

The school clubs plan their activities mainly around biology, chemistry, physics, astronomy, general science, mathematics or some combination of these.

Science club membership averages 22 members, but it ranges from a somewhat exclusive-sounding roster of three members to one all-out activity involving 750 students.

Clubs are sponsored by teachers of every science subject in the curriculum. Most of the teacher sponsors are drawn from the science faculty, but some teach other subjects. General science teachers lead the list with 45%. More than 36% of the sponsors are chemistry teachers.

Clubs also are sponsored by a great variety of people who are entirely outside of the teaching profession. A random sampling turns up an accountant, a Cub Scout den mother, a dentist, an executive of a scientific supply company, a former National Science Fair finalist and a veterinarian.

About 65% of the clubs report that their members are active in science fairs. Many clubs are chiefly responsible for organizing and conducting their school fairs. Others act as student committees for the large regional science fairs in their areas.

In preparation for annual fairs, science clubs frequently program project workshops and seminars where former science fair winners and professional scientists offer suggestions on project ideas and exhibit techniques. Color slides and movies of the projects at the National Science Fair-International are shown by many clubs as a source of ideas and a dramatic set of competitive standards.

Some of the great assortment of specialized activities reported by science clubs are photography, geology, medicine, conservation, nuclear science, aeronautics, paleontology, rocketry, civil defense, meteorology, junior museum work, soil sampling, science publications, model building, pet care, mechanics and studies of scientific careers.

Most club programs and activities are planned and carried out by club members, with the sponsor acting in an advisory capacity. Such a plan allows ample scope for the development of leadership, responsibility, initiative and creative ideas among the student members. The sponsor often is able to act as liaison between the students and community organizations, school administrators, scholarship foundations, scientific libraries and professional societies. In many cases the sponsor supervises group or individual laboratory experiments.

Affiliating a club with Science Clubs of America is a very simple procedure. All that is required is a note from the sponsor indicating the club's desire to join and to receive materials and information without charge. The Sponsor Handbook, supplied free to sponsors, is revised annually to provide the latest and most complete information on activities for science-minded young people.

Fairs: National—Local

Science Fairs show graphically and effectively the magnitude of creativeness and scientific enterprise of which young scientists are capable.

THE NATIONAL SCIENCE FAIR-INTERNATIONAL has developed to its present size and scope from a beginning of 13 affiliated area fairs in 1950. Even more spectacular is the expansion of the science fair program at local and regional levels. Feeding these, or operating independently, are school fairs which have become so numerous that it is difficult to keep track of them.

A science fair is a collection of exhibits, each of which is designed to show a biological, chemical, physical or technical principle, a laboratory or other procedure, an industrial development, or an orderly collection of anything which can be fitted into the broad concept of any branch of any pure or applied science.

Every year millions of people see science exhibits shown by students at science fairs leading to the national fair.

One reason for this growing student interest in science and technology during the past decade is the exciting advance which science has made and is projecting.

Coupled with this is the awareness of educators, from kindergarten through university, that genuine interest in science is sparked at a very early age, often before the first year of school.

Scientific and technical societies, cognizant of the tremendous shortage of skilled scientists and technicians, are encouraging science fair programs for the purpose of recognizing potentials early and because through them additional motivation becomes more easily possible.

Civic and social groups find that science fairs supply an outlet for constructive creativity of youngsters. The fairs provide a purposeful use for funds accumulated in educational and other accounts.

Newspapers sense the rich educational service which fairs give to the community. They often sponsor the program and take over, or assist, promotion, arrangements and financing.

Industry sees the science fair as an exemplification of the American way of free enterprise. It lends technical experts to the cause, and helps to finance it.

School Fairs

The simplest fair is an exhibition of science projects held in the school itself. There are shown all the experiments, collections and displays that have been worked out by students either in class or as extra-curricular science club activities. These fairs often are a feature of a meeting or a showing to which the public is invited.

City-wide, Area or Regional Fairs

These large science fairs may have several hundred exhibits, viewed by thousands of people who visit an exhibition hall which may be a school or college gymnasium, an armory, a museum or other such area. Some science fairs, even in large cities, accept the maximum number of exhibits the hall will allow. In other cases, the city or area fair receives only an allotted number of exhibits from each school, which holds its own eliminations first.

Exhibitors in such fairs are rewarded by the stimulation of having their work shown and by receiving certificates of merit. Other awards, ranging from emblems to cash prizes and scholarships, may be given.

National Science Fair-International

From regional or state fairs the best exhibits made by individual students (not groups) are selected for entry into the annual National Science Fair-International.

The rules of the national fair specify that to be eligible boys and girls must be students in the last three years of public, private, parochial or other secondary schools, and must have been selected for highest honors in a regional fair affiliated with the national organization.

Each affiliated fair is entitled to send two finalists and their exhibits to the national fair, paying their expenses and undertaking responsibility for them.

All exhibits must be individual projects and must be limited in size to 48 inches from side to side and 30 inches from front to back. Identical repetition of a project exhibited by the student at a previous year's science fair disqualifies the finalist. However, the project may cover the same field of investigation when a substantial amount of continued and expanded work has been done.

Exhibits must be durable and safely designed and constructed, using approved switches and cords for 110-volt operation. No dangerous chemicals, open flames, explosives or live poisonous reptiles may be exhibited. Live animals must be properly and humanely cared for, and any experimental work that has been done with them must conform with National Science Fair-International regulations for such experiments. Plants must pass federal and state quarantine regulations.

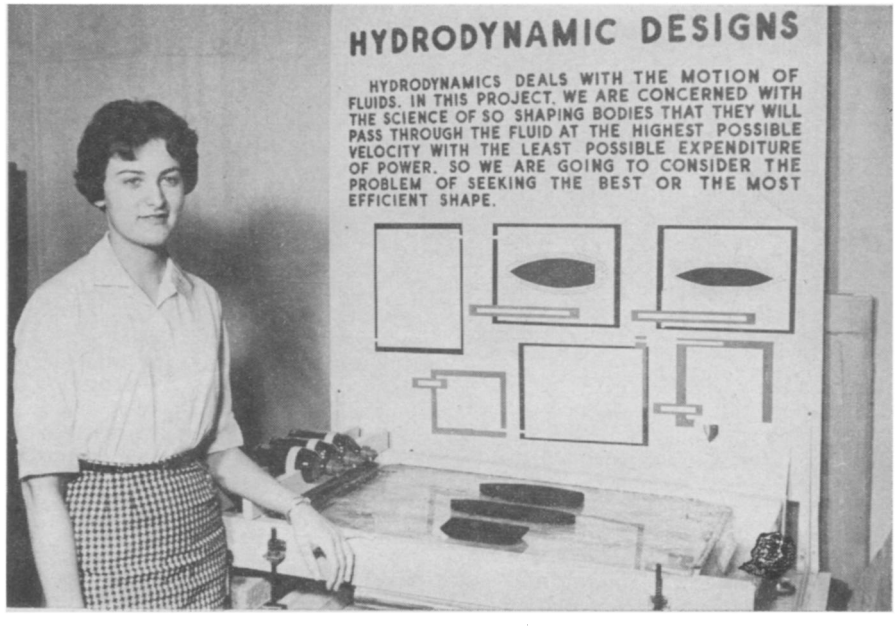
Honors and Awards

For National Science Fair-International Awards, exhibits are judged in the two general categories of biological and physical sciences, and the exhibits of girl and boy finalists are judged separately. First place awards are made to the top boy's and girl's projects in each of the two categories. Other awards are prorated according to the number of girls and boys among the finalists, regardless of the category of their exhibits.

Each finalist receives a rainbow-ribboned gold and silver medal engraved with his or her name and that of the cooperating organization. A facsimile medal on a certificate is sent to the principal of the school of each finalist to become a trophy in the school.

On the basis of critical judging outstanding finalists are given "Wish Awards"—selected scientific equipment and materials which winners have "wished for" to help them in the furtherance of their study and experimentation.

Special awards are made at the National Science Fair-International by the American Chemical Society, American Dental Association, American Heart Association, American Institute of Biological Sciences, American Medical Association, American Pharmaceutical Association, American Veterinary Medical Association, National Committee for Careers in Medical Technology, Optical Society of America, Society of American



Bacteriologists, U. S. Air Force, U. S. Army and the Association of the U. S. Army, U. S. Navy.

Judging is based on creative ability, scientific thought, thoroughness, skill, clarity and dramatic value of each exhibit. Scientists designated by Science Service judge the contest and the decision of these judges is final in all cases.

While every effort is made to prevent damage to exhibits, neither the National Science Fair-International, Science Service, the Committee of the host city nor any other sponsoring organization can assume responsibility for loss or damage.

All finalists participate in a four-day program of scientific sightseeing and meetings with leading scientists as well as the public. At the same time they become acquainted with other finalists having similar interests, compare their work and carry back to their local situations an enthusiasm and stimulation that will be reflected by others in future years.

Educationally Valuable

The whole science program is educationally sound. It allows the student to select freely the project upon which he plans to work. Automatically he leads himself through a study of the bedrock principles of his chosen topic, thus acquiring a basic, fundamental understanding of the facts and techniques involved. All elements of a stiff competition are present to urge the student to do his best, thus reflecting honors on himself, sponsors, school, city and state.

Educators and newsmen cooperating in the program of the National Science Fair-International plan the fair in a different city each year. This makes it possible for a finalist, who returns to the fair each year he is eligible, to visit three different cities, meet the outstanding scientists in each and visit them in their laboratories. Similar cultural values automatically extend to the accompanying educators and press representatives.

Regional or School Fair Rules

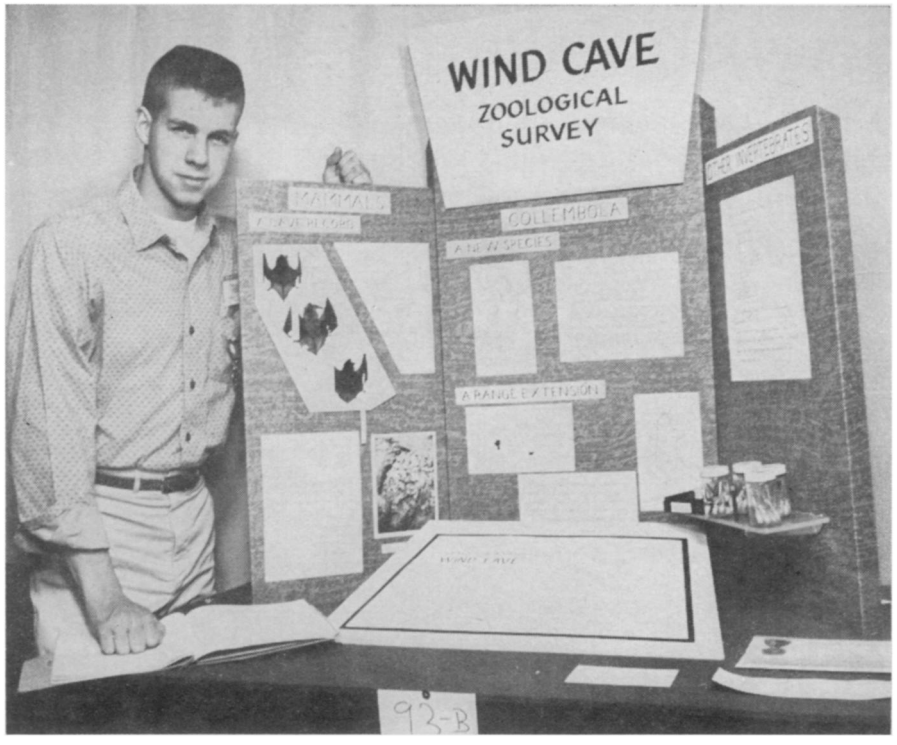
Regional and school science fairs generally use the rules of the national fair or adapt them to fit various local situations.

Depending on local rules, students may work individually or in groups. Exhibits must be designed and made by students. They may seek help from educators and others. Each exhibit should be so arranged that it can be understood by the layman without requiring an accompanying demonstration or lecture. Judgment of exhibits is based on work done by students, not on cost of accessory or incidental equipment.

How to Conduct a Science Fair

The science club sponsor or teacher, or group of sponsors or teachers, first should get permission from the principal or board of education for holding a science fair to which parents and the public will be invited.

The fair may be designed for operation in one school, or each school of a group of schools can schedule the event to occur substantially at the same time. The best exhibits may then be presented at a final centralized place.



Fairs should be held early in the spring. If entry is arranged for finalists to participate in the National Science Fair-International, the regional fair must close early in April. Names of finalists must be reported immediately to the National Science Fair-International headquarters, at the close of the regional fair.

Regional fairs may be held in classrooms in school, in the chemistry or physics laboratories, in the school gymnasium or cafeteria, in a community building, college building, museum or armory. In fact, any place where adequate electric current facilities are available and which will accommodate crowds will prove satisfactory. If held in a hall, local police and fire departments should be advised of the event so that guards can be posted to protect the properties adequately. School events should be monitored for protection and to guide people to and from the exhibit areas.

One of the goals of the National Science Fair-International is to permit access to the national event by every student through a cooperating fair within convenient access to his or her school. Long hours of travel are a hardship for young students, and are objected to by parents.

A broad perspective should be taken in the matter of geographical or other boundaries for the fairs. If a newspaper, radio or TV station, college or university, industry or other group assists toward the financial support of any regional fair, and if any one or all of these are so situated that they normally enjoy the friendship and good will from across state boundary lines, the entire area should be considered in the plans for a regional fair.

How to Enter the National Science Fair-International

Entry to the National Science Fair-International of exhibits and the students who made them is possible only through a regional, district or state fair which is affiliated in the national fair program. Affiliation requires signing a contract with the national organization, the payment of an entry fee, and assurance that the finalists will be properly selected and sent, all expenses paid, to the National Science Fair-International, together with their exhibits. No more than two finalists may be chosen for any one cooperating fair. Exhibits must be made by individual students attending school, and must be declared best in local competition. They must be students in the last three years of secondary school.

Experiments With Animals

The basic aim of scientific studies that involve animals is to achieve an understanding of, and a deep respect for, life itself and for all that is living.

A qualified adult supervisor must assume primary responsibility for the purposes and conditions of any experiment that involves living animals.

A trained biological scientist, physician, dentist or veterinarian must directly supervise any experiment that involves anesthetic drugs or surgical procedure.

Students shall not be permitted to participate in science fairs held under the auspices of Science Clubs of America until their adult sponsors have submitted assurance in writing that the rules drawn up in consultation with biological and medical research organizations have been observed. Request complete rules from Science Service.

Science Talent Search

Science-minded seniors are offered unusual opportunity for recognition and scholarship assistance toward careers in scientific research.

MANY STUDENTS in junior high school and the early years of senior high school look forward to and prepare for entering the Science Talent Search for the Westinghouse Science Scholarships and Awards when they reach their senior year of high school. This competition discovers, with essential educational cooperation, the youth of America whose scientific skill, talent and ability indicate potential creative originality. Science club and science fair activities have proved to be excellent preparation and background for success in this scholarship competition.

The Science Talent Search is conducted annually by Science Clubs of America as an activity of Science Service in cooperation with the Westinghouse Educational Foundation. It is open to boys and girls who are seniors in public, private or parochial schools in the United States, but excluding U. S. possessions, who are expected by the certifying school officials to complete college entrance qualifications before the following October. Students must not have competed in any previous Science Talent Search.

Each year an Honors Group of approximately ten percent of the fully qualified entrants is chosen for special recognition. Members of the Honors Group receive certificates and recommendations to the colleges and universities of their choice. These recommendations usually result in acceptance of the students for admission as well as scholarships and other financial assistance offered by colleges and universities seeking students of unusual promise in science.

From the Honors Group, the top 40 winners of the Science Talent Search are chosen. These winners are invited to attend the Science Talent Institute held for five days each spring in Washington, D. C., with all arranged expenses paid. During the Institute they are judged for five scholarships of $7,500, $6,000, $5,000, $4,000 and $3,000, and 35 Awards of $250 each.

Each winner receives a bronze Science Talent Search Plaque to be presented to the permanent honors and trophy collection of the winner's school.

Each member of the Honors Group receives a Science Talent Search Certificate signifying the honor. The Certificate, suitable for framing, is sent to the school for presentation to the student. It becomes his or her property.

Committees of judges designated by Science Service judge the contest, and the decision of these judges is final in all cases.

A scholarship may be applied toward a course in science or engineering at a college or university chosen by the winner and approved by a scholarship committee named by Science Service. Science and engineering courses must be within the fields of activity of the National Academy of Sciences and the National Research Council. If a scholarship winner withdraws from college, or if the Scholarship Committee disapproves further use of the scholarship because of reports from the college of unsatisfactory progress, any further benefits from the scholarship are forfeited.

Entering the Science Talent Search

To enter the Science Talent Search the senior takes the science aptitude examination in his own school under the supervision of his sponsor, teacher or other authorized school official. Such persons also prepare recommendations and see that the scholastic record is transmitted. The student writes a report of about 1,000 words on "My Scientific Project." This should involve original work. Entrants should develop a project that is planned for the Search or adapt to the Search something they already are doing.

Science teachers and school officials qualified to administer the examination may request entry materials for any number of eligible students. Entry blanks are mailed from Washington about Nov. 15. The examinations must be administered early in December.

All entries in the Annual Science Talent Search must reach headquarters of Science Clubs of America in Washington, D. C., by midnight, Dec. 27.

Girls as well as boys are encouraged to enter the Science Talent Search. The number of girls chosen for honors is determined by the proportion of girls who complete entries.

Search Winners Succeed

One of the most frequent questions asked is, "Do Science Talent Search winners really become successful scientists?"

The winners all have attended or are attending college. With rare exceptions they proceed to bachelors' and about 50% of those who have had time have doctors' degrees. The education of these winners has been supported liberally by scholarships and fellowships. Advanced study on fellowships takes many of them abroad.

Membership in such honorary fraternities as Tau Beta Pi, Phi Beta Kappa and Sigma Xi is so frequent as to be almost standard.

Publication of their work in various scientific journals increases as they proceed with education and research.

Almost every known science has at least one winner specialist. Physics has attracted the largest number. A very small minority choose non-science fields for their careers.

The largest group prefers academic research and teaching. As professors they often have more recent winners in their classes or working as their research assistants.

The second largest number now working full time is in industry. Research is the most frequent assignment but a few are in sales, production or administration.

Offers of summer employment in research laboratories come to all 40 as soon as they are named winners.

Almost all earlier winners have served in the armed forces but later ones, in general, have been deferred until their education is completed.

Most of the older winners are married and many have four or five children. Science Talent Search women tend to marry scientists and engineers of comparable training or more. The men do not so frequently choose mates in those fields but all have college-trained wives, frequently with degrees to match their own.

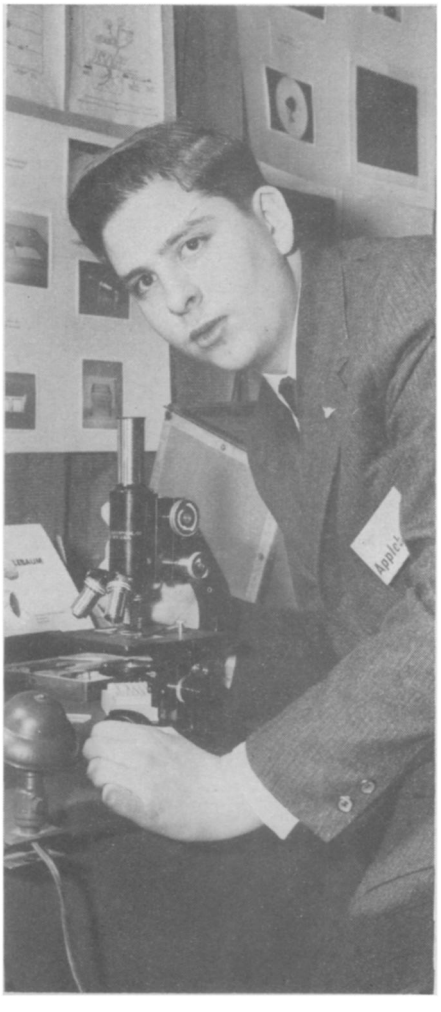
All women have worked before marriage; many afterward. Those retired to care for their children express the desire to resume their careers later. Meanwhile they keep up their science themselves and through their husbands' work.

By entering the national Science Talent Search, students automatically enter a state search, if one is held in their state, at the close of the national competition.

Science Talent Search Aids

Back issues of Science Talent Search science aptitude examinations and answers are available as long as the supply lasts. Specify the year desired. The price is 15c per copy, answers and passing scores included.

Send 50c to cover postage and packing of a bundle of four different past Science Talent Search booklets containing abstracts of winners' papers and other information.



How to Do a Science Project

Read widely—Your success with science projects depends largely on how much you know about your subject. Wide reading broadens your understanding of the possibilities and limitations of your project. Search your school, public, and nearby university, college and specialized libraries for publications in your project field. Librarians are most willing to help you.

Question others—Scientists draw heavily upon the knowledge of others in their own and related fields. Acquire the habit of consulting with others about your plans. Often a classmate or an adult can point out an error in your thinking or suggest a method which might take you many hours to detect otherwise.

Professional scientists and technicians are always glad to help answer your questions if you follow simple rules of courtesy such as querying them when they have time to answer and questioning them only when you have done enough reading and thinking to be able to ask intelligent questions. If you do not abuse their kindness you may, like other young scientists, find adults eager to lend you not only suggestions, but also equipment, books, publications, etc., that you might not otherwise be able to secure.

It even helps to talk over your project with an intelligent person who knows nothing about your work. In attempting to explain it to him you will be forced to clear your own thinking and his questions may point out areas that need more attention for the sake of clarity.

Plan carefully—Scientists save much time and money by planning so thoroughly that the actual experimenting goes through with a minimum of failure. Try to anticipate the difficulties you will encounter and forestall as many as possible by deliberate planning.

Set up effective controls and keep complete records of all your work, both successful and apparently unsuccessful.

And some don'ts—

Don't write some organization to send you everything it has on the subject, or expect the staff to do your project for you.

Don't tackle such a large project that you have time only to build the instrument you plan to use. If you must build an instrument that you have not tried to build before, better limit your project to that, and present a completed job.

Don't become discouraged. See your project through to a logical stopping point.

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Static Electricity—Sparks from your fingertips when you walk across a carpet and touch metal? On a cold, dry day you can experiment with the phenomena of static using the materials in this unit. Gives understanding of some of the fundamental facts of physics. 17 experiments.

Straight Line—Can you draw it freehand? Did you know that it is a curve? James Watt not only invented a steam engine but also the first linkage, used in guiding a piston in a straight line, which you can assemble out of this unit. A fascinating assemblage of 30 pieces of material with which you can draw your own original straight line and other curves.

Make Your Own Electric Motor—No better way to understand how electricity does work and the role played by magnetism. Full assembly directions of all parts—20 of them.

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It's much faster than you can wink an eye, yet time enough for Bell Laboratories' new high-speed switching terminal to transfer your voice to another channel while you are talking by telephone.

The new terminal—recently introduced on the transatlantic cable—uses the idle time in the conversations of talkers on a group of channels to provide paths for other talkers. This time-sharing technique, called Time Assignment Speech Interpolation, permits the sending of 72 simultaneous phone conversations over this deep-sea system where only 36 could be sent before.

TASI takes advantage of the fact that in a normal telephone conversation you actually talk less than half the time. You do not talk when you are listening, and even when you do talk there are pauses between sentences, words, and syllables. When there are more talkers than channels, TASI puts this idle time to use.

Scanning each circuit thousands of times a second, TASI instantly notices when you aren't talking, then quickly switches in someone who *is*. TASI also notices when you resume talking, immediately finds a channel not in use that moment and switches you to it. Your voice may be switched many times during a single conversation in a time too fast—about 15 milliseconds—for your ear to perceive.

The TASI switching terminal was rendered feasible by the transistor—an invention of Bell Telephone Laboratories. More than 16,000 transistors are employed to achieve the compact, dependable, high-speed circuitry required. TASI is another example of how Bell Laboratories works to keep your telephone service the world's finest.

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