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September 9, 1961

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SCIENCE NEWS LETTER

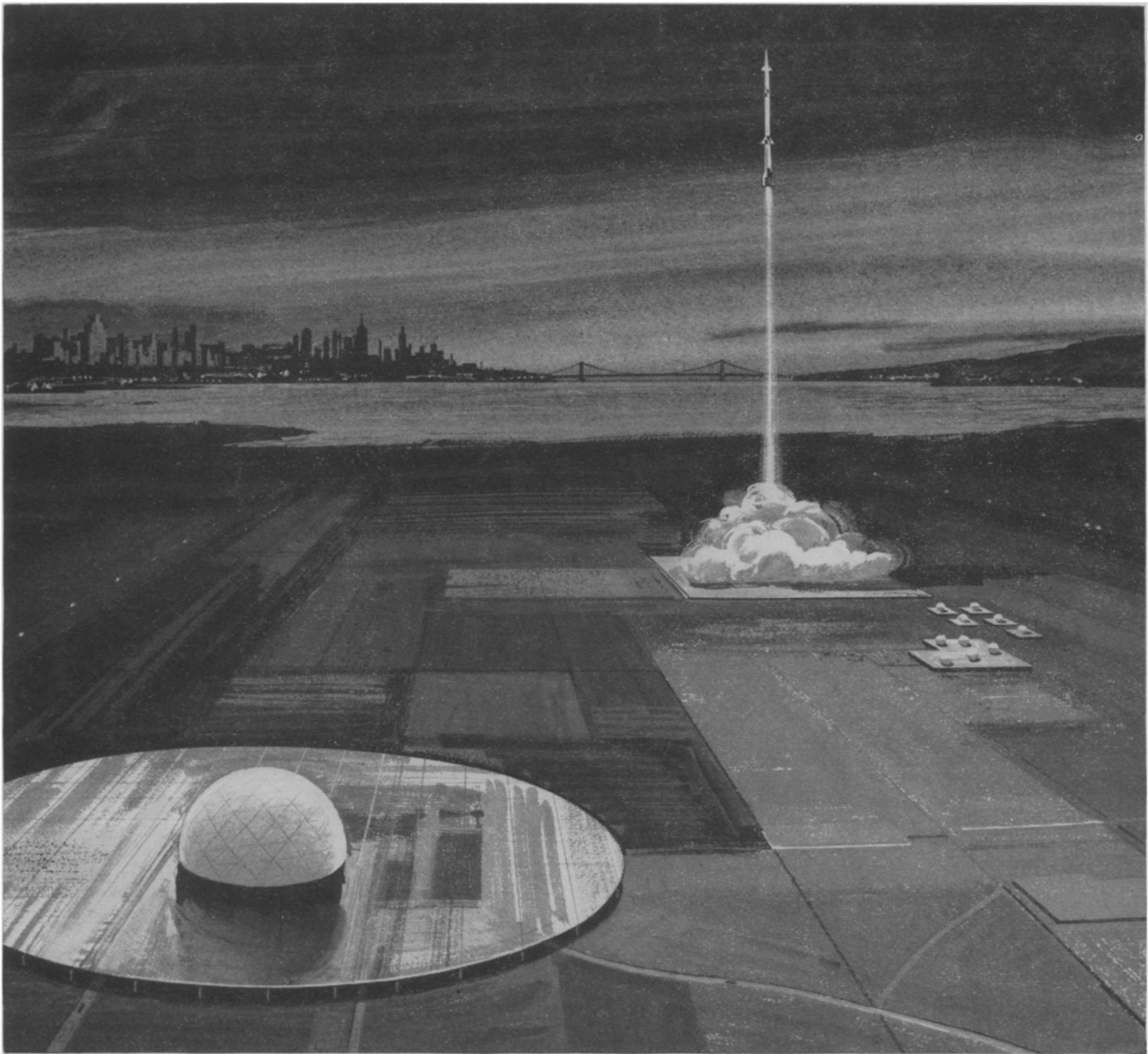
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Spraying by Plane

See Page 178

A SCIENCE SERVICE PUBLICATION



More than 450,000 pounds of thrust lifts the U. S. Army's Nike Zeus missile skyward in a cloud of vapor. The Nike Zeus missile being developed for the project by the Douglas Aircraft Company will be designed to intercept ballistic missiles traveling over 15,000 miles per hour, and destroy them at a safe distance from the defended area.

How do you stop an ICBM?

How do you detect, track, intercept—and destroy within minutes—an ICBM that is moving through outer space ten times faster than a bullet?

Bell Telephone Laboratories may have designed the answer: Nike Zeus, a fully automated system designed to intercept and destroy all types of ballistic missiles—not only ICBM's but also IRBM's launched from land, sea or air. The system is now under development for the Army Ordnance Missile Command,

Radically new radar techniques are being developed for Nike Zeus. There will be an acquisition radar designed to detect the invading missile at great distances. And a discrimination radar designed to distinguish actual war-

heads from harmless decoys that may be included to confuse our defenses.

The system tracks the ICBM or IRBM, then launches and tracks the Nike Zeus missile and automatically steers it all the way to intercept the target. The entire engagement, from detection to destruction, would take place within minutes and would span hundreds of miles.

Under a prime Army Ordnance contract with the Western Electric Company, Bell Laboratories is charged with the development of the entire Nike Zeus system, with assistance from many subcontractors. It is another example of the cooperation between Bell Laboratories and Western Electric for the defense of America.

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THE **SCIENCE SERVICE**

National Science Youth

PROGRAM



OVER 700,000 BOYS AND GIRLS PARTICIPATE

in this international program for encouraging science talent. The Youth of Today will become our Scientists of Tomorrow through the motivation and stimulation of these SCIENCE SERVICE activities . . .

NATIONAL SCIENCE FAIR - INTERNATIONAL

SCIENCE CLUBS OF AMERICA • SCIENCE TALENT SEARCH



At no cost whatever

you can join the

largest scientific organization in the world

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SCIENCE CLUBS OF AMERICA

1719 N Street, N.W., Washington 6, D. C.

Please enter my class, group or club for 1961-62 affiliation with Science Clubs of America without charge. Send me the free educational aids and tested science techniques. I understand that we shall have the cooperation of the SCA staff in organizing and helping us conduct interesting and worthwhile activities. Please keep us informed on the National Science Fair-International and the Science Talent Search.

Name of Sponsor _____
(Sponsor must be a science teacher, parent, youth leader or professional scientist.)

School or Organization _____

Address _____

City _____ Zone _____ State _____

Y8006

AFFILIATION

Please check for club listing.

My school is: _____ My group is from: _____

Elementary Club

Jr. High School Classes

Sr. High School Other _____

Number of club members _____

Science Fair in my school: Yes No

I read Science News Letter: Yes No

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● **HOW TO FIND OUT THE NEW IDEAS OF SCIENCE!** Now you can get a 16-page illustrated SCIENCE NEWS LETTER each week, tersely and compactly written, filled with news of science, important developments, new inventions, research—new ideas that can be helpful to you, information that you can find in no other single place.

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● **WONDERFUL WORLD OF SCIENCE**—A guide to free and low cost science materials just for the asking or pennies and dimes . . . compiled by Science Service to cover every field of science. Paperbound, 50¢ each plus 5¢ postage. Ten copies in one package—\$5.00 postpaid. \$.....

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Order from: **SCIENCE SERVICE • 1719 N Street, N.W. • Washington 6, D. C.**

Please send Science Service Aids to Youth as checked above.

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

Name _____ Title _____

Address _____

City, Zone, State _____

Y8006

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 700,000 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 class, group or 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 thirteenth of which will be held in Seattle, Wash., May 2 to 5, 1962. 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 1961 for the 21st time, the Science Talent Search uses a science aptitude test on a nation-wide basis to select 10% of the 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 40 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.

The Science Talent Search is 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; coop-

erates 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. SCIENCE NEWS LETTER regularly carries news

of SCA affiliated science clubs.

THINGS of science, experimental kits containing unusual specimens or explaining experimentally processes through which a familiar product passes, have been issued monthly since 1940. Production of these kits has 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 groups 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, in the 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.

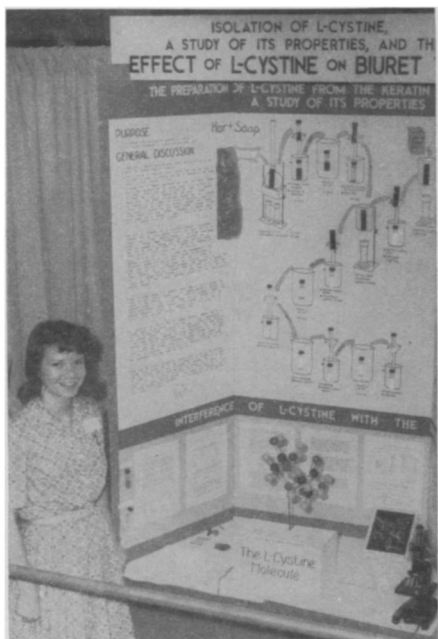
All exhibits must be individual projects and must be limited in size to 48 inches from side to side and 30 inches from front to back. Identical repetition of a project exhibited by the student at a previous year's science fair disqualifies the finalist. However, the project may cover the same field of 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, subdivided respectively into a number of sections. The projects of boy and girl finalists are judged separately. First, second, third and fourth place awards are made in these respective sections. In sections where there are not sufficient entries to sustain judging, sections may be combined.

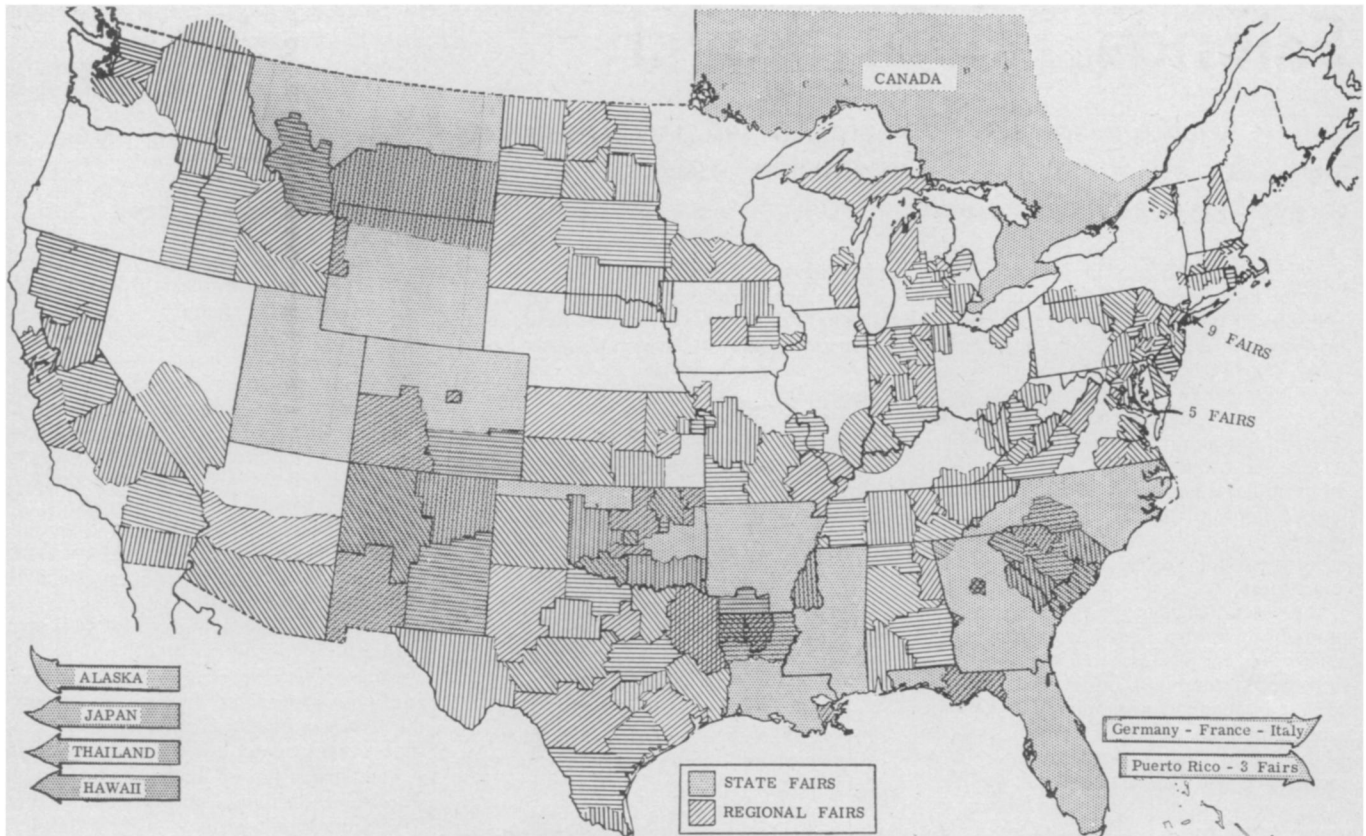
Each finalist receives a rainbow-ribboned gold and silver medal engraved with his or her name and that of the cooperating organization. A replica medal on a certificate is sent to the principal of the school of each finalist to become a trophy in the school.



Joyce Lea Yucker, 17, NSF-I Finalist from Northwestern New Mexico Regional Science Fair. Project: L-Cystine Preparation and Properties.



Christopher George Cherniak, 16, NSF-I Finalist from the Florida State Science Fair. Project: Development and Use of Tissue Culture of Functioning Single Neurons.



Fairs affiliated with the National Science Fair-International in 1961.

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 Institute of Biological Sciences, American Medical Association, American Pharmaceutical Association, American Society for Microbiology, American Veterinary Medical Association, National Aeronautics and Space Administration, National Pest Control Association, Optical Society of America, Pathology-Medical Technology, U.S. Air Force and Space Education Foundation, U. S. Army, and the 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 stimula-

tion 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.

Additional information on conducting and organizing a science fair will be sent without charge or obligation to anyone requesting it. Write to Science Service.

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.

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 verify the personal data form submitted by the student 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.



The 40 Science Talent Search winners visited President John F. Kennedy during the 20th Science Talent Institute in Washington, D. C.

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.



Joshua Wallman, 17, top STS scholarship winners from New York City, conducted experiments in animal behavior for his Talent Search project.



Mary Sue Wilson, 17, STS winner from Cedar Falls, Iowa, chose the field of biochemistry for her project.

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.


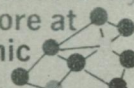



Don't tackle such a large project that you have time only to build the instrument you plan to use. If you must build an instrument that you have not tried to build before, better limit your project to that, and present a completed job.

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

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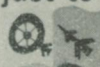


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WONDERFUL WORLD OF SCIENCE MOORE AND VIORST



Kodak reports on:

when to remember our name and when to forget it... high cards for the polypropylene game...
the pallid virtue in a certain niggardliness

A little x-ray news

More precious than rubies is confidence in the importance of what one does for a living. One thing we do for a living is to manufacture x-ray film. Unkind words are rarely spoken about society's need for x-ray film. Now we have news about x-ray film and need to make it seem important. Easy.

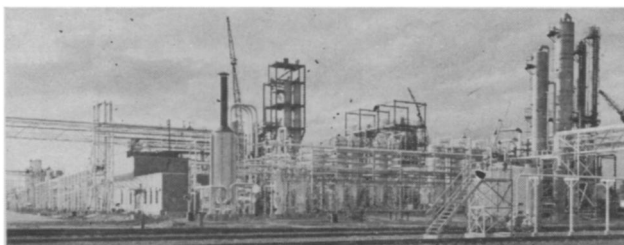
The first piece of news has it that *Kodak Industrial X-ray Film, Type M* is now obtainable with emulsion on one side only instead of both sides, the way x-ray film usually comes in order to double the strength of the image. Simple, yes; trivial, no. Ties in to the very large subject of mankind's current push for great structural strength in small mass. Load-bearing members are now getting so thin that putative flaws on their radiographs have to be checked out with a microscope. Since a microscope can focus on only one side of the film at a time, it's better to have the other side blank. Enough of this is being done now so that x-ray dealers are stocking the single-coated film of high contrast and fine grain.

Eastman Kodak Company, X-ray Division, Rochester 4, N. Y., will be glad to guide you to such a dealer.

The second piece of news much exceeds the first in importance. The nuclear testing debate has gone on for years. As an intelligent citizen, you have been given estimates by various authorities of how much radiation you and your children can expect to soak up, barring disaster. You have been told how much to figure for medical and dental radiological examination over a lifetime. Meanwhile we have been quietly goofing up the statistics! We have been upping the response of the films. With the latest step, the same amount of examination requires half or a third as much radiation as had been estimated.

No action is required on your part. Just privately rejoice a little at how the deal has been sweetened a bit for you, statistically.

To John!



$[-\text{CH}(\text{CH}_3)\text{CH}_2-]_n$

This tidy little plant cost us a tidy little sum. It stands in Longview, Texas, receives propane by pipeline, and is now ready to turn it into 20 million pounds of polypropylene per annum.

We are not alone. Seven other large and reputable companies are known to be playing in the game against each other and us. If none of the players' announced plans go awry, 460 million pounds of polypropylene capacity will exist in the United States *next year*. Sober estimates of demand range from a pessimistic 300 million pounds to an optimistic 450 million pounds by 1965. All we players must

therefore be very brave, hide our nervousness, and raise our glasses high in a toast to the memory of Senator John Sherman, who believed in the great public good that comes of free and untrammelled competition.

As the game gets under way, we hold certain strong cards. Perhaps the other players will show you theirs, too. *Tenite Polypropylene*

- Can be polymerized from propylene by two completely different processes of our own devising, both free and clear of the U. S. patents of others.
- Comes in the widest range of flow rates.
- Comes in a wide variety of impact-resistant formulas.
- Comes in the widest variety of reproducible colors.
- Is exceedingly well fortified by our own antioxidants against oxidative deterioration.
- Has "built-in hinge," i.e. tremendous fatigue resistance under flexure.
- Weathers very well when extruded in monofilament for webbing and cordage, because of our own ultraviolet inhibitors.
- Has high enough softening temperature so that when it is extruded as sheet you can cook in it and yet on a yield basis it costs less than cellophane.
- Has the lowest ash of all current polypropylenes and therefore the lowest dissipation factor for high-frequency insulation.

Has been under intensive sales service scrutiny for better than four livelong years so that we can tell you a great deal about it when you write to Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company).

Sound tape, very sound

Eastman Sound Recording Tape has just started to enter the professional sound-recording market. The future will speak for itself, but for the present not a single reel of it is offered blank for home recording. (Digital recording tape is a different article.)

Eastman Tape differs from the best professional sound tape hitherto available only in uniformity, a pallid virtue but one not to be sneezed at because it made us what we are today in the motion-picture business, where a man who has to throw work away for technical inadequacy winds up slinking through back alleys.

Magnetic tape needs about the same thickness of coating as do the emulsions of a complicated color film, where much of the secret of success lies in niggardliness with thickness tolerance. Thickness variation of magnetic oxide coating shows up as spurious amplitude modulation. The oxide particles themselves closely match in size the silver halide crystals of a medium fine-grain photographic emulsion. The problems of preparing their surfaces for uniform distribution through a matrix are familiar to us. The answers turn out a little different from those first thought out, but satisfactory. Eastman Tape is no better than the best rolls of the best-regarded grade of the best-regarded other brand. Our methods, however, make *all* our rolls that good.

Eastman Sound Recording Tape is currently sold only by Eastman Kodak Company, Motion Picture Film Department, 342 Madison Avenue, New York 17, N. Y.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

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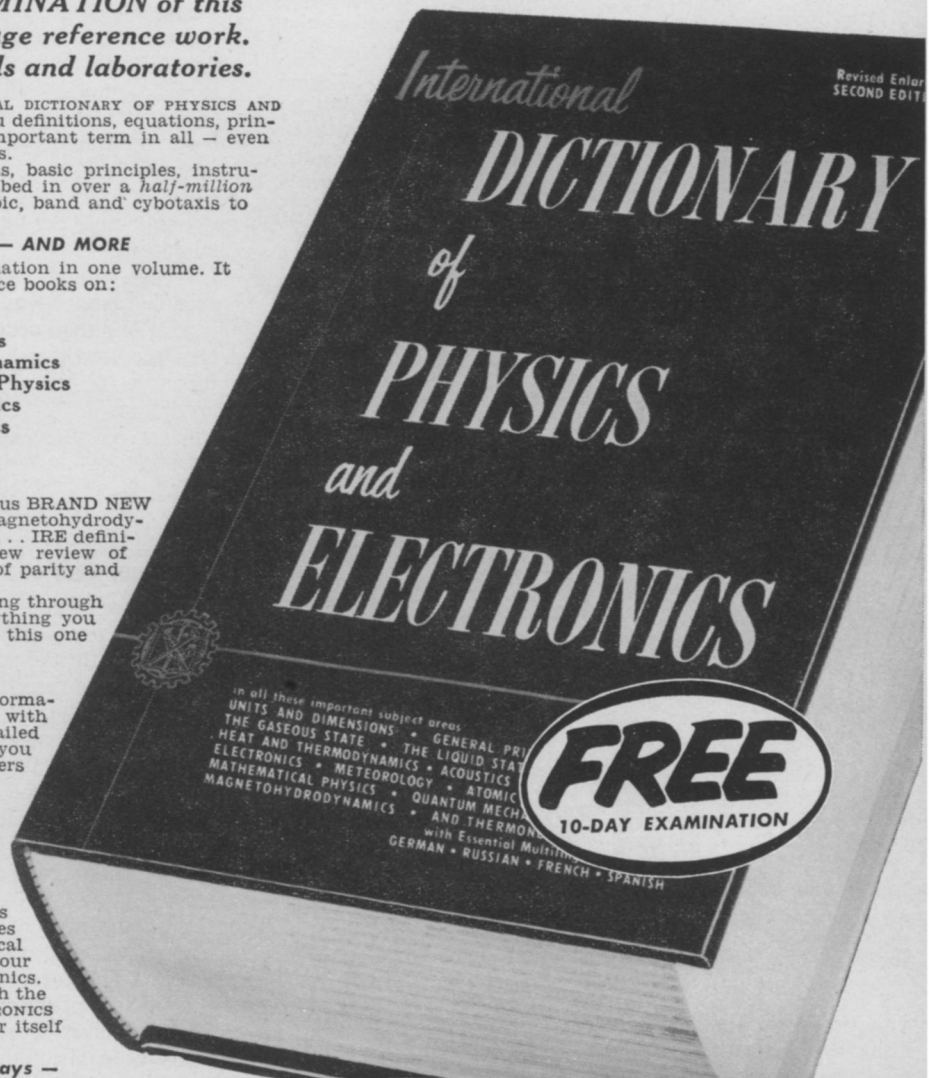
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