

GENERAL SCIENCE

# Science Youths Start Younger

Potential scientists now are developing their original interest in science as early as eight or ten years of age, inspired by parents, books, magazines and the urge to explore.

By SHIRLEY MOORE

► THE COMING generations of American scientists are discovering their interest in their future careers at younger and younger ages.

Although 12 continues to be the Golden Age for realizing the potentials to be discovered in the world of science, the most recent statistics based on 219 science fairs show the age of 10 becoming nearly as productive of possible scientists. This year's analysis of when 410 students had their science interest kindled shows the number of 8-year-old starters is not far behind and is overshadowing age 13, which used to be one of the peak years. The diagram gives data accumulated for 2,433 national fair finalists, not just the 410 on which the following information is established.

The shift to increasingly youthful origins of scientific drive has become evident year by year as the annual statistics are compiled by SCIENCE SERVICE for each succeeding National Science Fair-International. The statistical profile of the 410 finalists who exhibited their top level science projects at the 14th National Science Fair-International, conducted by SCIENCE SERVICE in May 1963 in Albuquerque, N. Mex., suggests some interesting trends.

## Parents Are Influential

Parents are more aware of the value of making science a natural part of small children's lives. More than ten percent of the finalists dated their original focusing of interest in science during the year when they were eight years old, giving an overwhelming number of credit lines to their parents and the opportunities provided by them.

Tabulating the number of times each influence was listed, either alone or in combination with other factors, only half as many such credits went to their own curiosity and independent observation. Inspiration generated through books and magazines was rated somewhat more effective than their own inborn drive.

Considerably less influence was exerted on this eight-year-old group by schools and teachers. Other factors commonly mentioned by finalists whose interest began at other ages also received negligible credit. Four students were unable to say what magnetism drew them into science at eight.

On the other hand, those whose interest was sparked at 10 years of age were rather predominantly self-starters. Home and school were rated as less stimulating, and about equal in their influence. Reading helped to inspire about a fifth of the ten-year-olds, and science fairs and clubs as

sumed some importance for the first time at this age.

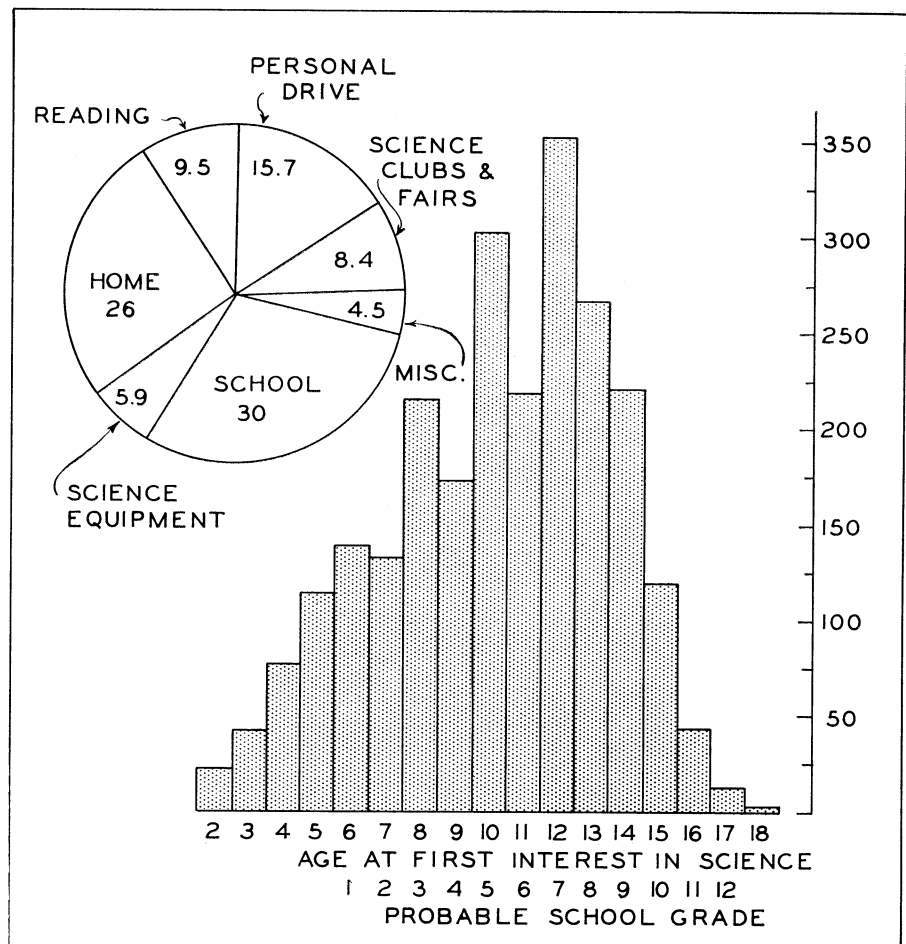
Almost 15% of the finalists were 10-year-old starters. The attention of about 9% was captured at 13, and of not quite 10% at 11 years of age. Since 11 has been a consistent low spot on the cumulative graph, this may indicate the beginning of a change in the responsiveness of 11-year-olds to some unidentified kindling agent.

The highest percent of finalists reported that their original interest was stimulated at 12 years of age, with 15% joining finalists of past fairs to maintain 12 as the peak year of origin. However, a shift of influence is evident among the 12-year-olds. School courses, experiences and opportunities, plus the stimulus and example offered by individual teachers, received some or all of the

credit from 45% of this age group. Next in importance were home influences, independent curiosity, and science fairs and clubs, each of which was mentioned with about the same frequency.

The peculiar crevasse on the cumulative graph, formed by relatively disinterested nine-year-olds, is especially pronounced when this year's science fair finalists are graphed separately. Looking into the specific factors that caused the interest of the few who did start off at nine, we find that home influences and the personal inner urge to know share the top of the list. Other influences were school experiences, books and other reading material, and gifts of science equipment and kits.

So the question of why science seems to have so little attraction for the nine-year-old remains unanswered. Could science be presented to him at school and at home from some particular angle that he would find more appealing? Or is nine simply an age when the average fourth grade student couldn't care less, no matter what the angle?



Science Service

**SCIENCE INTEREST IN YOUTH**—These graphs compiled from a SCIENCE SERVICE study depict the complete range of age and source of first science interest in 2,433 finalists at National Science Fairs.

Graphing the relative weights of influences listed as important by the entire group, another trend appears to be in the making. A great many more young people are reporting that they began scientific pursuits on their own impetus, usually driven by their consuming desire to explore the known and unknown. Family and home have risen slightly in importance.

But the impact of the school has dropped from 35.1% in 1962 to 23.5% this year; and the availability of science equipment was less significant in developing the early interest of this year's top high school scientists, declining from 8% last year to 3.6% in this year's evaluations. Both reading and science fair and club activities are rising somewhat in persuasiveness.

It is interesting to note that 61% of this year's finalists are members of science clubs and 81% have been active participants in science fairs for one to several years. Science fairs and science clubs, and at least some of the motivation supplied by reading materials, actually are part of the total influence of school opportunities. It may be that some areas of the curriculum have become less provocative in the opinion of the students.

An innovation at this year's National Science Fair-International was the installation in the exhibit area at Albuquerque of an International Business Machines computer. Expertly programmed, the computer tracked the whereabouts of members of the official party, arranged tours of scientific installations for specific numbers of finalists, educators and newsmen, and compiled a great deal of information about the finalists.

### Tabulations by Computer

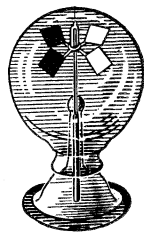
The computer counted, for example, the number of times various sources were mentioned by the finalists as having been wholly or partially responsible for the ideas behind their outstanding projects. Books, magazines, journals and scientific papers received 254 credits. Individual curiosity and observation of phenomena were partly or entirely responsible for 250 ideas. School courses, laboratories or activities received 81 mentions. Personal hobbies were at least partially the basis of 61 projects, scientists helped to spark 48 ideas and new current interests of finalists inspired 32.

Other idea sources cited included discussions at home, science institutes, visits to professional laboratories and science fairs, summer and part-time jobs, professional meetings, accidental developments, special programs and many others.

When the IBM specialists programmed the computer to survey the educational backgrounds of the parents of the finalists, the totals showed 136 fathers who did not continue their education beyond high school and 160 mothers. Bachelor's degrees were earned by 110 fathers and 90 mothers; master's degrees by 23 fathers and 24 mothers. Seventeen fathers and two mothers hold the Ph.D., and a variety of M.D.'s, L.L.B.'s, D.D.S.'s, etc., are spread through another 42 degrees held by parents.

Almost exactly one-third of the mothers are employed, and of these one-third are

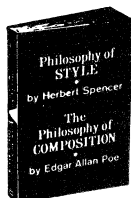
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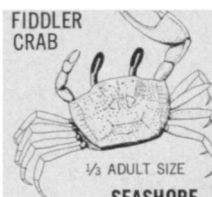
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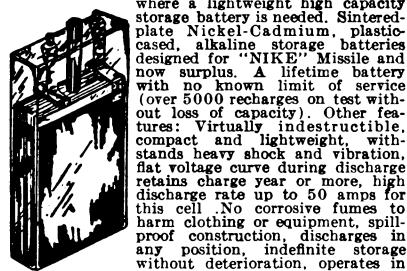
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