

## A Reservoir of High School Science Teachers

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Many high school girls have aptitude for scientific work. Although the shortage in these fields is acute, few of them train for scientific occupations. Of all the scientific occupations, teaching in high school seems best fitted to absorb a large number of girls with scientific talents. Science teaching is a good field for a girl with interests in science because the supply is small and the demand great and widespread, geographically, so that nearly anywhere in the United States she could find a need for her services. The period of training for science teaching, which faces the high school girl, is not in excess of that required for other professions open to women.

Since, then, this vocational vacuum seems to exist, why do not high school girls with scientific aptitudes plan to fill it? What becomes of girls with scientific interests? Why do they not enter the profession of high school science teacher in greater numbers? Into what lines of work do they go upon graduation from high school?

An opportunity for a small-scale investigation of these questions has developed in central Oklahoma in that area within a twenty-mile radius of the Oklahoma College for Women. Last year, Oklahoma took an inventory of its high schools, an appraisal unique in the annals of state-wide education. A battery of tests was given to 60,000 Oklahoma high school students by Science Research Associates, working under the auspices of a public service organization called the "Frontiers of Science." The "Iowa Test of Educational Development" was used. Results were returned to each high school where the tests were given. By visiting the high schools, the names and scores of individual students could be obtained. In the present instance, high schools within 20-miles of the Oklahoma College for Women were visited and a list was drawn up of women in the graduating classes whose scores in science subjects and whose composite scores were on or above the fifty percentile grade as determined for the whole nation.

The opportunity was unique in that girls in small schools were tested in the same way as those in the bigger schools. Also, here was an objective standard to judge scientific aptitude, quite apart from the teachers' or the girl's own estimate. In two schools, the Iowa test was not given, but in its place, were available scores from the Occupational Aptitude test, given by the Employment Service. From these tests, a list of senior girls with above average scientific aptitude, was compiled.

Nineteen high schools were visited, from which had been graduated a total of 252 girls. The average number of girls in the graduating classes was thirteen. In other words, the high schools were small; only one school graduated more than thirty girls in the spring of 1956.

The area is primarily agricultural, which means that in this particular year economic conditions were had due to a prolonged drought. The largest city is Chickasha, with a population of 20,000, where the Oklahoma College for Women is located. The college is a small, liberal arts, state-supported institution. Fees are so low—\$59 per semester—that it is difficult to believe that they could not be met by any girl with a desire to attend. To summarize, the area studied is made up predominantly of rural or small town communities and, at its center, is a readily-accessible, state-supported college. Girls from this area should find economic reasons for not going to college reduced to a minimum. However, poor roads and poor harvests are real obstacles, while all-time high employment opportunities are cogent arguments for going to work.

Of the 253 girls graduated in this area, 40% or 100 individuals were above the 50 percentile of the national norms in science subjects. The 50th percentile normally would have included nearer 50% of the graduates. In

many of the schools in this study, however, science has been neglected in the curriculum because of a lack of science teachers. Many small schools in Oklahoma have dropped science because of an inability to get qualified teachers.

To each of these 100 girls, a letter was written explaining how their names had been selected. A postal card was inclosed with the letter asking four questions: (1) Are you going to college? (2) If so, where? (3) In what do you plan to specialize in college? (4) If you are not going to college, what will you be doing this winter?

About one-fourth of the girls filled in the postal cards and returned them. The others on the list were contacted by telephone or personally. In some cases, a parent furnished the information. Seven girls had "disappeared"—no data were obtained for them.

In answer to the first question—"Are you going to college?" the following results were obtained:

- 52% not going to college
- 48% going to college

Of those not going to college, the following answers were received to the question, "What will you be doing this winter?":

1. Housewife 28%
2. Stenographer 16%
3. Business College 12%
4. Helping at home 10%
5. Clerking 10%
6. Telephone office 10%
7. Nurse's training 6%
8. Other gainful occupations 10%

If we consider high school girls with scientific ability as making up a "reservoir of science teachers," as the title of this article suggests, how can the non-college 52% be utilized eventually to increase the number of women teachers of science? Nearly half the non-college girls apparently moved directly from high school into jobs in which they earn their living. How can the number going directly to work be decreased and the number going to college be increased? How many of the girls prefer their present occupations to college? If other sources of supply fail to materialize, and if the need for science teachers becomes sufficiently acute, a way will be found to subsidize the education of girls of high scientific aptitude.

These girls want to be independent and in many cases they need to be self-supporting. Their economic independence is a mark of maturity. All but 10% of them are on their own.

The preferred gainful occupation is a secretarial job. Twenty-eight per cent are or soon will be stenographers. This preference will be evident again among those entering college. The "good job" is being a stenographer.

The non-college girl wants to feel that she can take care of herself. This seems to be her number one motive. Only a college that could reassure her would be able to interest her. The college must convince her that at any time she could withdraw and would find herself capable of supporting herself. If such a condition is met, she would feel free to continue her education.

A combined commerce and basic science course would probably attract girls of high general aptitude to college. As it is now, her investment in studying to be a science teacher will not pay off unless she can stay in school for four years. She feels that she cannot count on four years. So let us help her to get a combined training, some of which has a value at the end of one year.

If scholarships by federal enactment become available to high school graduates of high scientific aptitude, a fair share should go to girls who will plan to become science teachers. The science teaching field should be given as high a priority as any other type of science training.

The following majors were selected by the 48% planning to attend college.

Business and Secretarial Training	22%
Various science fields such as medical technology, pre-medic, B.S. in nursing, physical therapy, science teaching	18%
Music	14%
Speech and speech therapy	5%
Foreign languages	5%
Home Economics	5%
Religious Education	5%
Elementary Education	2%
Art Education	2%
English	2%
Sociology	2%
Undecided	18%

Here again, as with the girls not going to college, the preferred occupation was secretarial training. Twenty-two percent of the scientifically gifted girls attending college enrolled in business courses. Twenty-eight percent of the group, who did not enter college, were employed as stenographers or had entered business college. Apparently, a young girl in central Oklahoma wants to know she can make her own living beyond high school. She feels the training in commerce courses gives her this assurance.

In the present phase of prosperity, many families can meet expenses only if both parents work and if all young people above high school age are employed. By full employment is meant employment by all employable persons, not employment of the father alone. In the past, prosperity meant that enough money was coming in from the adult males of the family to provide comforts and leisure to all the family, especially allowing for the education of the family members. At present, prosperity means that by all members working, the bills are met. The present high employment rate means that young women in central Oklahoma when they graduate from high school must be or must very shortly plan to become wage-earners. If they go on to take a college training, they want to feel prepared to stop at any moment and go to work.

If this really is the case, then a course in secretarial training must be available without its crowding out everything else in the freshman girl's horizon. Instead of competing with the commerce department or the business college, the girl's wishes should be met. But, in the case of these girls with scientific talent, there should be a basic science requirement in the freshman year. Each girl, who has a good science aptitude score, should take a science course as part of her general education requirements along with the secretarial training she feels impelled to undertake. If the science instructors can get these girls, as freshmen, it then becomes their responsibility to interest them in science teaching as a profession. For this selected group of freshmen women, no other part of the freshman course would be as important from many angles. How the science instructor is to interest these girls in the science teaching field, is a subject in itself and beyond the scope of this paper.

The case in point is this: At Oklahoma College for Women, twenty girls with scientific aptitude above the average registered as freshmen. Only three of them found their way into basic science courses. Eventually, if they stay in college and major in subjects other than music, they will

have to take a laboratory science. All twenty of them should have taken science as freshmen. Then, at least, those of the faculty interested in recruiting science teachers would have had the maximum opportunity to contact the group of scientifically gifted freshmen.

In summary, if high school girls with above average scientific ability are to become a reservoir of science teachers, the first step is to get these girls into college. We now know who they are, thanks to the aptitude tests encouraged by the Frontiers of Science, and we shall know for another three years.

In the case of the 50% who do not now enter college, two suggestions arise: (1) More financial assistance and (2) a combined commerce and basic science course. The commerce course is for the purpose of reassuring them economically. The basic science course is for the purpose of interesting them in science teaching.

In the case of the 50% of the scientifically superior girls who enter college, they should be enrolled in science courses as freshmen. Only a very small percent at the present time take a laboratory science. Sometimes they have other interests in mind and seem to feel that the science requirement is to be put off as long as possible. Since they are scientifically gifted, they should get into science classes as freshmen.

This study has asked the question "What becomes of the scientifically gifted girl when she leaves high school?" The answer for nearly 25% of them, college and non-college taken together is, "they become stenographers;" 15% marry and have a family at once; nine percent enter college with science majors; only two percent plan to become science teachers.