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Developing Scientific Womanpower: Gender and the Cold War-Era Science Fair

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When the newest issue of *Life* magazine appeared on newsstands on October 21, 1957, probably few people were surprised that the cover image depicted three (male) scientists tracking the orbit of Sputnik. A little more than two weeks earlier, the Soviet Union had launched Sputnik, the first artificial earth satellite, and now Americans were asking, in the words of *Life*'s headline, "Why Reds got it first" and "What happens next." The magazine reported extensively on the science behind Sputnik, what new information it had revealed about space, and the opinions of prominent scientists and statesmen on the reasons behind the Americans' failure to be first. At the same time, *Life*'s authors reassured readers that the United States was certainly capable of launching its own satellite, but doing so would depend on a change of attitude among the American people regarding the importance of science and particularly of the scientific education of young people.

Although Sputnik represented a new and unexpected moment of crisis, one necessitating more bright young scientists ready to match and surpass the Soviets, American science had dealt with

such threats before. After the outbreak of WWII, existing networks of science clubs and fairs had been nationalized in the form of the Science Talent Search, its goal not simply to promote knowledge of science but to identify and nurture the young men–and women–who would keep American science ahead of its competitors in the years to come.

The Science Talent Search had its roots in the Science Service, originally founded as a news service to distribute information about the latest scientific research to the public. But in the 1930s, under the leadership of Watson Davis, the Science Service began to expand its scope. The organization created a network of institutions that encouraged young people, as well as their parents and teachers, to explore science; they shared information about local and national happenings through their own *Science News-Letter*.

The Science Service created the Westinghouse Science Talent Search in 1942. The corporate name affixed to the STS reminds us that Westinghouse invested significant money and publicity. In this way the STS set the tone for much of the subsequent discussion about promoting science among American youth. Though the first search was held less than a year after Pearl Harbor and was very much shaped by wartime concerns, it was also clear that organizers were already planning for a future in which the United States would exercise scientific leadership. The high-school students of the 1940s—both boys and girls—needed to be prepared for that future.[1]

When the first Science Talent Search was announced in the spring of 1942, it was described as something more than a scholarship contest that would help identify promising students of science. It was also "a major step towards making available potential scientific talent to important tasks in war and peace. Within the next five years, either in war or peace, boys and girls now in high school must

[1]Historiography: we hope to refocus the subject away from the post–1957 era which has tended to dominate scholarship on mid-century American science education.

begin to take leadership in scientific research and engineering." In addition to taking a science aptitude test, STS applicants were asked to write an essay on "How Science Can Help Win the War." In later years, a science project would be required, but in 1942, organizers wanted to focus attention on how "science is backing our total war effort for Victory."[2]

STS organizers expected that over 10,000 high school students nationwide would take the two-hour science exam. Of these applicants, forty would be chosen to visit Washington, D.C. for the Science Talent Institute, and twenty of these finalists would win scholarships (provided by the Westinghouse Electric Corporation) ranging from $200 to $2400 for two Grand Science Scholarships.

Though it was never explicitly stated in the pages of the *Science News-Letter*, it seems clear that STS organizers, like many other Americans, felt that in a time of national emergency, no source of scientific talent should go untapped. There was also an argument to be made that for the duration of the war, at least, girls were a better "investment" than boys, since they did not have to worry about having their education interrupted by military service.

Thus, in publicizing the STS, organizers were careful always to note that the competition was open to both boys and girls. Since they expected more male applicants, in order to ensure that girls were fairly represented, trips and scholarships were awarded in proportion to the total number of boys and girls competing.[3] In practice, this meant that during the 1940s, of the forty finalists,

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[2]"Science Talent Search Offers 20 Scholarships and 40 Trips," *Science News-Letter* 41, no. 17 (April 25, 1942), 259.

[3]"10,000 High School Seniors in Science Talent Search," *Science News-Letter* 41, no. 22 (May 30, 1942), 343.

between eight and twelve were girls. Moreover, from 1942 until 1948, two Grand Scholarships were awarded, one to a boy and one to a girl.

The organizers seemed pleased with the results. A 1945 article in *Science News-Letter*, providing updates on the finalists of the first four talent searches, noted of the 43 female finalists, "since they are not subject to the draft and most of them are too young to be accepted for uniformed service women's organizations, they have gone on with their college courses." Half of the male finalists, on the other hand, were currently enlisted in the armed services, and while some of them were "permitted to continue their medical, dental and engineering courses under Army and Navy training programs," many others were put into positions where "their scientific background was of little or no use." In the meantime, young women like Anne Hagopian (first-place winner, 1944) and Constance Sawyer (finalist, 1943) had taken over jobs previously held by men at the Harvard College Observatory.[4]

After 1945, Science Service hoped that the momentum they had built up during the war years could be sustained with the return to peace. Though the sense of urgency that had originally prompted the Science Talent Search was no longer present, organizers hoped to link science to postwar prosperity and optimism about the future. A typical article in *Science News-Letter* on the "Search for Scientists" from 1950 evoked the need for the United States to "keep its place of world leadership in war and peace" by developing "better drugs, fuels, weapons, communications and all those things which make America what it is."[5] When asked what they thought science's most important job was, "an overwhelming majority" of STS finalists in 1950 stated that "science ought to

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[4]Margaret Patterson and Frank Thone, "Scientists of the Future," *Science News-Letter* 48, no. 12 (Sept. 22, 1945), 186–188.

[5]Margaret E. Patterson, "Search for Scientists," *Science News-Letter* 58, no. 20 (Nov. 11, 1950), 314.

tackle the job of creating a lasting peace through the method of attacking hunger and disease."[6] Although participants occasionally drew connections between social unrest and the lure of Communism, the Soviet Union rarely appeared in Science News-Letter as a cause for concern or a motivating factor in the late 1940s and early 1950s. Whether this was because SNL writers did not see the Soviets as a threat or because they did not wish to tie the promotion of science to any specific political agenda is difficult to say.

In the meantime, Science Service continued to promote the Science Talent Search and, in 1950, introduced a new nationwide science competition, the National Science Fair. The NSF grew out of a network of local, regional, and state science fairs that had been developing since the 1930s. While the STS was designed to find the most elite students, the NSF had a broader and more democratic basis. Science Service certainly hoped that providing recognition and awards to the very best science projects would encourage those students to continue their science studies, but science fairs were also seen as a way to develop a general interest in science among all students, as well as parents and the community at large. As one article noted, even though the majority of science fair participants would not go on to pursue careers in science, their experiences would leave them "better equipped to live in a scientific world and control the results of science so that civilization will progress rather than be wiped out."

This same author presented science fairs as a modern variant of the traditional county fair, one in which "girls who once might have entered jams or needlework…now may present an explanation of some nuclear phenomenon, a demonstration of making plastics or a dissected biology

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[6]"Truman Receives Winners," *Science News-Letter* 57, no. 10 (March 11, 1950), 149.

specimen."[7] Because of the science fair's more egalitarian basis and the NSF's prize system, girls had potential for equal participation and recognition. The National Science Fair awarded four top prizes, for a boy and a girl in the biological sciences division and for a boy and a girl in the physical sciences division; the NSF maintained this award structure even as the Science Talent Search eliminated their prizes for top boy and top girl. After 1948, the STS awarded only one grand scholarship, and it was not until 1972 that a girl won the top prize, although the number of female finalists remained about the same throughout the first thirty years of the competition.

In almost all discussions of science education in the postwar era there is a consistent thread of tension between the desire to make science accessible to all, as it should be in a democratic society, and the perceived necessity of nurturing the best and brightest in the interest of national security. The Soviets' "forced educational system" (as Watson Davis called it) was producing impressive numbers of scientists and engineers, but American educators and policymakers were adamant that the U.S. must not adopt a similar system. Rather, American students needed to be exposed to science from a young age and given opportunities to participate in science in schools and clubs.[8] At the same time, broader attitudes towards science needed changing. While studies showed that American youth generally had positive views about science and scientists, when it came to choosing careers for themselves, the stereotype of the scientist as a weird, boring, "egghead" seemed to be holding students back.[9]

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[7]Ron Ross, "Work of Young Scientists," *Science News-Letter* 54, no. 20 (Nov. 13, 1948), 314.

[8]"Science Youth Movement," *Science News-Letter* 68, no. 1 (July 2, 1955), 13.

[9]Margaret Mead and Rhoda Métraux, "Image of the Scientist among High-School Students," *Science*, new series 126, no. 3270 (Aug. 30, 1957), 384–390.

What effect did these conflicting views about science and scientists have on girls who participated in national science competitions? In some circumstances, the impulse to find the best students could benefit girls. If–as one scientist argued– "only two percent of the babies born are potential geniuses who might be tomorrow's top flight scientists," and half of those were girls, it was just as important to to encourage girls' early interest in science as it was boys'. Chemist Ethaline Cortelyou, speaking at a meeting of the American Association for the Advancement of Science, argued that "little girls should be encouraged in whatever interest they show in tools, machinery and insects and should never be teased for being 'tomboys.'"[10] But at the same time, if the ultimate goal was to single out the best of the best, there was little incentive for organizers to make sure that girls received equal representation and recognition. They assumed that if a girl was truly deserving, surely the judges would recognize that. But the fact that no girl won the top prize, and that only one or two generally made the top ten, after the STS eliminated separate prizes for boys and girls, suggests that there was some bias at work.

The organizers and publicizers of the STS and NSF seemed to feel that they were treating boys and girls equally, and indeed they made great efforts to demonstrate that all competitors were normal, well-rounded teenagers who just happened to be very good at science. The descriptions of 1949 grand scholarship winner Dwight Taylor and runner-up Caroline Littlejohn are typical. Dwight, whose prize-winning project involved the identification of shellfish, was "neither a bookworm nor a single-tracker. He likes sports, especially tennis and badminton, is a member of the staffs of both his school paper and annual, and collects stamps as well as shells." Caroline, who hoped to become a theoretical physicist and whose project dealt with an unsolved problem in the theory of

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[10]"Womanpower Needed," *Science News-Letter* 75, no. 2 (Jan. 10, 1959), 22.

relativity, also enjoyed "outdoor sciences" and had made collections of plants and insects.[11] Again and again, *Science News-Letter* reported that finalists were not just "brains"–even Marilyn Rohrer, jokingly called "the brain" by friends, and who exhibited a collection of 33 brain specimens, had her interests balanced out by her passion for trumpeter Harry James.[12] Science Service even polled the forty finalists of 1957 on the question, and were no doubt reassured to learn that all but six felt that their fellow students did not consider them "long hairs" or "egg heads."[13]

Science Service certainly believed that it had found the best way to identify and nurture science talent through the Talent Search. Already in 1943 the *Science News-Letter* was claiming that it has been "instrumental in locating and developing talent which might otherwise have been lost forever to our country."[14] As Watson Davis explained, the science aptitude test had been "developed for the Science Talent Search by Dr. Harold A. Edgerton, director of the Occupational Opportunities Service of Ohio State University and Dr. Steuart Henderson Britt, executive director of the National Research Council's Office of Psychological Personnel" using "the most advanced testing methods developed over the past two decades." The test, along with a the applicant's "scholastic and extra-curricular achievements as well as his personality traits, work habits, initiative, and other qualities," and an essay on a science project, seemed to work when it came to identifying promising scientists.[15]

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[11]"Top Science Scholarships," *Science News-Letter* 55, no. 12 (Mar. 19, 1949), 179–181.

[12]"Science Scholarships," *Science News-Letter* 49, no. 11 (Mar. 16, 1946), 163.

[13]"STS'ers Not 'Egg-Heads," *Science News-Letter* 71, no. 12 (Mar. 23, 1957), 182.

[14]"Science Scholarships," *Science News-Letter* 44, no. 19 (Nov. 6, 1943), 294.

[15]Watson Davis, "Science Talent Test," *Science News-Letter* 43, no. 6 (February 6, 1943), 87.

Writers for *Science News-Letter* continued to track the progress of finalists for many years and they found that most of them did indeed go on to pursue careers in science. One update noted that of the 560 finalists from the first fourteen years of the search, "all are in or have attended college. With very few exceptions they advance to a bachelor's degree, and over 50% of those old enough already have a doctor's degree." Most of those employed full time were working in industry, with government service and university teaching and research close behind.[16] This raises an important question, however. Was the STS actually exceptionally good at identifying scientific talent, or did becoming an STS finalist create opportunities that students might not have otherwise had? 1947 Grand Scholarship winner Rada Dyson-Hudson, when she was interviewed on the subject in 2003, stated that she was certain her STS award had helped her win a Fulbright Scholarship and National Science Foundation awards, "and once I got those two, they helped with the Guggenheim. Westinghouse was the beginning of the chain." These fellowships, in turn, helped her land a job in the department of anthropology at Cornell University.[17]

For women attempting to complete graduate degrees and find employment in science, having the Science Talent Search or National Science Fair's "seal of approval" must have been a tremendous boost. During the period between 1945 and 1957, especially, when priority was generally given to returning servicemen and concerns about manpower shortages were at a low point, women who had succeeded in the extraordinarily competitive environment of the STS and NSF surely had an advantage over those who had not. The record of success among STS finalists and NSF winners suggests that Science Service could have had an even greater impact on women's participation in

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[16]"Seek Young Science Talent," *Science News-Letter* 68, no. 17 (Oct. 22, 1955), 260.

[17]Allan Richter, "Six Decades of Science Contest Prowess," *New York Times,* March 9, 2003.

science had it made more of an effort to see that girls were represented equally in the competitions. However, to draw attention to the disadvantages faced by girls and women would have conflicted with the image of American science as egalitarian and meritocratic that they wanted to show to the world. Moreover, bringing more girls into the competition would have threatened to feminize science, thus potentially making it less attractive to boys.

But though too many girls might have made science seem overly feminized, having too few girls might be even worse. Indeed, the inclusion of girls in the Science Talent Search and National Science Fair can be seen as a way to make science more attractive to young men. Showing that girls also participated in science fairs, though not in such a way that they overshadowed boys, sent a signal that science was a normal, healthy activity. Over the years the organizers repeatedly emphasized that the participants were not "eggheads," that they were healthy young normal Americans. A science fair that excluded girls entirely would send a very different message to potential future participants.

Thus, the photographs of science fairs shown in the *Science News-Letter* were carefully chosen to portray boys and girls in groups and to show the female participants as attractive young women. The captions, like the text elsewhere in *Science News-Letter*, emphasized that these were normal young Americans.

To return to where we began, with the October 21, 1957 issue of *Life* that laid out what Americans knew about Sputnik. This issue featured a second story that touched on issues of gender and science: a photo essay on the first female students at Muhlenberg College in Allentown, Pennsylvania. Though it was the last of the nation's thirty Lutheran liberal arts colleges to embrace coeducation, even "the sternest bastions of Muhlenberg masculinity" were, according to the article,

soon won over by the "diplomatic and decorative" new students. Most of the story focused on extracurricular activities, but one photo depicted "lone girl" Taimi Toffer in the midst of an otherwise all-male chemistry class.[18] As several letters to the editor in the November 11 issue pointed out, Miss Toffer was "an 'only' in more ways than one." For one thing, she had won first place in the physical science division at the National Science Fair in 1956, only four years after she and her family immigrated to the United States from a displaced persons camp in Austria. And for another, shortly after the photo was taken, she had been crowned queen at Muhlenberg's first homecoming dance.[19]

Almost as soon as the Toffers (who were originally from Estonia) settled into their new home in Allentown in 1952, "every spare corner…became crowded with science fair projects." The Toffer siblings, Hans, Taimi, Kristina, and Annika, dominated the Lehigh Valley Science Fair; Taimi and Kristina would go on to win awards at the National Science Fair in 1956 and 1957, respectively. All four graduated from Muhlenberg College, and all except Kristina pursued careers in science. Taimi worked in organic chemistry research and was her family's primary wage earner while her husband went through medical school.[20]

This single issue of *Life* magazine thus brings together many of the themes we've talked about today: concerns that Americans were falling behind the Soviets in science education, efforts to promote science among young people through fairs and other competitions, the participation of high-school girls in these competitions at a time when the enforcement of traditional gender roles was at a high point, and the effects that science fair achievement had on girls' future careers as

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[18]"Sound of Girlish Voices Strikes a New Note at Muhlenberg," *Life* (October 21, 1957), 111–115.

[19]Letters to the Editors, *Life* (November 11, 1957), 20.

[20]Dick Cowen, "Science Awards Blazed Career Paths for Family," *Morning Call* (June 25, 1992).

scientists. For Science Service, Taimi must have seemed like the ideal "poster girl" for what they were trying to accomplish, showing that traditional modes of femininity and "scientific womanpower" could coexist comfortably in one person: Taimi the Homecoming Queen *and* Taimi the Science Fair Champion.