GIRLS, GIRLS, GIRLS

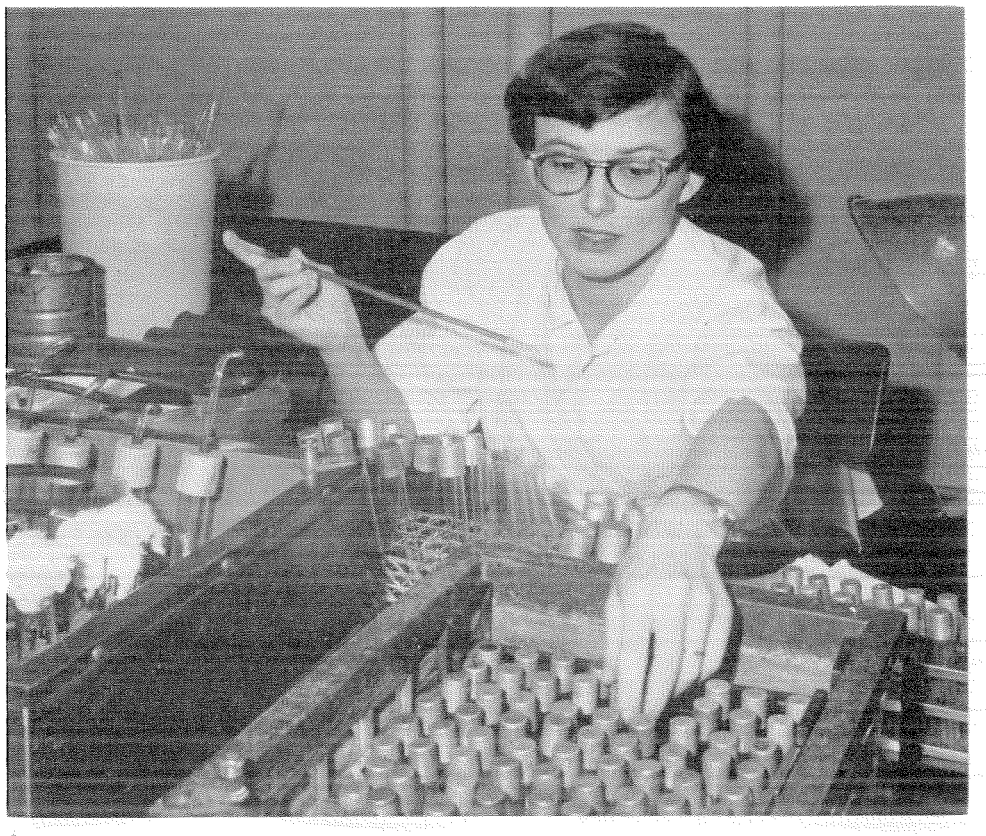
A progress report on the female population in the Caltech student body

CALTECH BROKE a long-standing tradition when it admitted its first female student in 1953. There had been ladies in the school in the days when it was a coeducational institution known as Throop University and Throop Polytechnic Institute, of course; in fact, there was even a department of domestic science in those days. But after the move to its present campus in 1910 the Institute began to concentrate on engineering, and science, and men only.

It was an extraordinary situation that caused Dorothy Ann Semenow to apply for graduate work in chemistry at Caltech in 1953—and it took extraordinary action by the Caltech faculty and board of trustees to admit her.

Miss Semenow was at MIT at the time, doing graduate work under the direction of John D. Roberts. When Dr. Roberts accepted a position at Caltech as professor of organic chemistry, Miss Semenow asked to be transferred here with him so that she could continue with her research. It took a change of Institute policy to grant her request.

The admission of Miss Semenow didn't exactly break the log-jam and flood the campus with women; the entrance requirements that were set for female graduate students took care of that. The Institute accepts only "women of exceptional ability who give promise of great scientific contributions," and, before she can enroll, a woman has to get the approval of the committee on graduate study, and of the academic division in which she intends to work. With restrictions like this, it is not surprising to find that only five women graduate



Mrs. Elizabeth Bertani, second woman graduate student to be accepted at Caltech

students have been admitted to Caltech to date.

Miss Semenow, who got her PhD in 1955, is now teaching chemistry at Pomona College. Mrs. Ellen Smith Thomas was the second woman to receive a degree. A graduate of the University of Oklahoma (where she got her BS "with distinction" in aeronautical engineering, in 1952) she entered Caltech in the fall of 1955 and received her MS in aeronautics in June, 1956. She is now a designer with the Aerojet-General Corporation in Azusa.

There are three women graduate students at Caltech this year—Mrs. Elizabeth Bertani and Miss Jeanne Mayfield in biology, and Miss Florence Raulf in geology.

Elizabeth Bertani has been here since 1954—which means she was the second woman graduate student to be accepted at Caltech. A native of East Chicago, Indiana, she did her undergraduate work at the University of Michigan, and got her BS "with distinction" in 1953. She started out in college with the intention of becoming an MD. (Her father, and one of her two brothers are MD's; the other brother is a physicist.) Between her sophomore and junior years, though, Betty took a summer job in the bacteriophage laboratory at Michigan, and thereupon decided on a career in virology.

Betty began her graduate study at the University of Illinois, under S. E. Luria, professor of bacteriology. There she met Giuseppe Bertani, a research associate at the University, and a co-worker in the bacteriophage laboratory. They were married in 1954, and when her husband accepted an appointment at Caltech as a senior research fellow in biology, Betty applied to continue her graduate studies here. She is here on a National Science Foundation fellowship, working under Max Delbruck, professor of biology. Her thesis in preparation concerns problems of lysogeny—the study of temperate viruses. If all goes well, Betty should get her PhD this June, after which she hopes to work in the field of basic research on viruses.

Ivan Jeanne Mayfield is the biology division's second woman graduate student. She was lured here, after a year of graduate study at Stanford University, by the work of Roger Sperry and his group in psychobiology.

Jeanne (she doesn't use that first name anymore—especially around here. Ivan, it turns out, is her father's name, but the only reason Jeanne inherited it was that her mother thought it sounded so nice with Jeanne) was born in Whitehall, Montana. The Mayfields moved to California when Jeanne was quite young and she went to Chino High School and to Pomona, where she majored in biology, was elected to Phi Beta Kappa, and graduated summa cum laude.

Jeanne went to Stanford to do undergraduate work in the department of embryology, under Victor C. Twitty. Her studies there were on the development of the nervous system of salamanders, but after spending some time with these creatures, she developed an interest in studying the higher processes of the central nervous system. As a result, she abandoned her durable but dull-witted salamanders and came to work at Caltech under Roger Sperry, professor of psychobiology.

Here, Jeanne maintains a collection of highly intelligent fish. By enticing them with food, she has taught them to tell the difference between different colors and even different patterns. One of her smartest pupils is an *Astronotus*—a tropical fish called Oscar for short—which

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Miss Jeanne Mayfield, second woman graduate student in biology

Miss Florence Raulf, Caltech's first woman graduate student in geology

learned to differentiate between yellow and green in only six days. One of her most willing subjects is a blue gill—a wild fish—which refused to eat for a whole week when he first came to the lab. Then Jeanne put a female swordtail in the bowl next to him. For a few days the blue gill sulked on the bottom of his tank, sullenly watching the swordtail eat regular meals, then finally gave up the fight and started feeding. By now he jumps for food whenever Jeanne comes near his tank.

Jeanne discovered after she got here that she was inadequately prepared in mathematics, so she is plugging away at correspondence courses from the University of California in calculus and physical chemistry. Added to her full Caltech schedule, these courses give her a fairly solid program—i.e., one that would knock out a good many mere males. Though there is hardly time to look ahead right now, Jeanne expects to get her PhD in the spring of 1958, and then to do research in the field of memory.

Florence Raulf is Caltech's first woman graduate student in geology. While she was still an undergraduate at Brooklyn College, Florence joined the Air Force with the idea of doing weather forecasting. After three-and-a-half years, she left the service with no further interest in weather forecasting, a solid training in cartographic drafting, and a great enthusiasm for geochemistry. This meant a lot of concentrated science and mathematics, and Florence continued her education in night school all the time she was in the service; then, when her duty was up, she went back to college. She graduated magna cum laude.

When it came to picking a graduate school, Florence concentrated on western ones because she wanted to learn more about West Coast geology. She hadn't given any thought to applying to Caltech though, because she thought it was all-male until she saw a newspaper picture of Dorothy Semenow getting her historic degree. That did it. Florence got a catalogue, found she had the requirements for admission, and entered Caltech last fall. After she gets her PhD in a few years, Florence wants to go into teaching.

A girl geologist is a rarer *avis* at Caltech than a girl biologist or chemist; those departments have always had women research assistants, laboratory workers and so on. As a result, Betty Bertani and Jeanne Mayfield haven't had to waste any time fighting for equal rights. In fact, about the only time Jeanne is aware of this being a male stronghold is on registration day, when the idea is brought home to her rather forcefully as she lines up with the other students. "You feel something like a Martian," she says simply.

Florence Raulf is having to break the ice for women in the geology division—which has always been pretty flamboyantly male. Probably the thickest ice Florence encounters is on field trips. These are, traditionally, no place for a woman—so, when Florence goes on them, she has to try to haul as much of the equipment and to maintain the same breakneck pace as the other students. The results are something less than spectacular. "On field trips," Florence says philosophically, " I don't see much of the other students—I'm all the time dragging along 50 feet behind them."

She'll catch up with them yet though. Girls are here to stay.