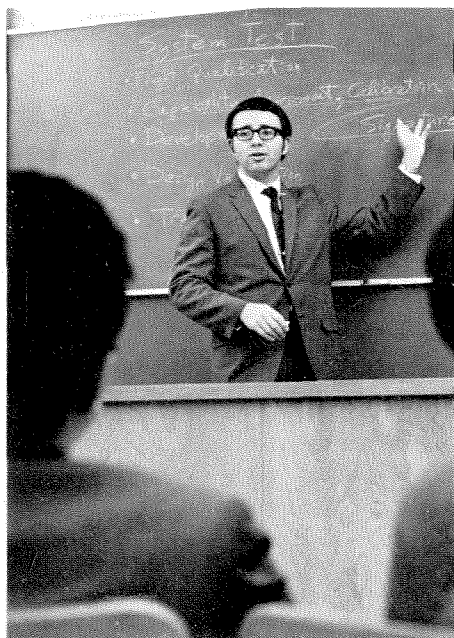


The Month at Caltech

Systems Engineering

Ralph Miles is one of those "total" Teachers; he got his BS here in 1955, his MS in 1960, and his PhD in 1963—all in physics. Now he is back on campus as a visiting assistant professor of aeronautics and environmental engineering science, on loan from JPL where he is a member of the technical staff.

The main reason for his return is to teach a course in spacecraft engineering, Ae 250. He is also the moving spirit behind a current seminar in systems engineering, "Systems Concepts for the Private and Public Sectors," which will consist of ten public subscription lectures on the theory and application of systems concepts. The lectures are given by authorities in fields that utilize systems concepts, and are held on Tuesday evenings at 7:30 in Ramo Hall in the



Ralph Miles

new Baxter Hall of the Humanities. The first meeting of the seminar was held on March 30.

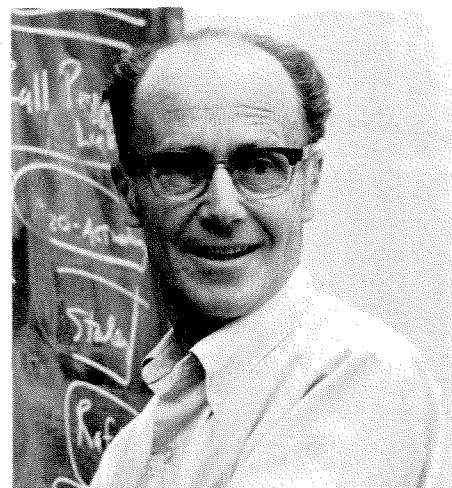
Simon Ramo, another Caltech alumnus, opened the series with a discussion of both the potential and the limitations of the systems approach. Ramo, a TRW Inc. executive and a member of Caltech's board of trustees, is known for his provocative ideas, and he has recently published two books on the application of science to social problems: *Cure for Chaos* and *A Century of Mismatch*.

In addition to being open to the public, the series will be the basis for a class Miles will teach during third term: Ae 241—Systems Engineering. One requirement of the course will be for the students to carry out systems analyses of two problems developed by the Harvard Graduate School of Business—one concerning helium conservation in the U.S., and one on how to transport passengers to and from Washington, D.C., airports more efficiently than is now possible.

The idea behind the seminar is one that Francis Clauser, chairman of the division of engineering and applied science, is interested in pursuing vigorously. He is urging that men of vitality and vision from industry and other universities be invited to campus frequently to keep engineering students and faculty up to date on new developments. The Miles seminar fits neatly into this program.

Miles sees the need for the systems approach as calling more for a change in emphasis than in content in dealing with some troublesome aspects of our society. He feels there should be more stress on defining goals, considering systems in their totality, and developing workable alternatives.

"Much of the effort of systems research today," he says, "is being directed toward civil and social systems, which now lie on the frontiers of systems engineering. The optimal design and operation of civil and social systems will require further research at the discipline and basic science level. To a large extent this is going to involve the 'hardening' of the soft sciences such as psychology, sociology, and political science."



Norman Davidson

ACS Award

Norman Davidson, professor of chemistry, is the 1971 winner of the American Chemical Society's \$2,000 Peter Debye Award, established in 1960 to reward outstanding research in physical chemistry. He received the award at the 161st national meeting of the society in Los Angeles this month.

Davidson is responsible for fundamental advances in nucleic acid chemistry and for the development of new methods for solving problems in molecular biology. His recent use of the electron microscope to study the arrangements of genes in DNA molecules has provided the most accurate genetic map known to date.

A member of the Caltech faculty since 1949, Davidson is the executive officer for chemistry and has served as chairman of the Faculty Board.

Buwalda Room

The favorite lecture room of John Peter Buwalda, the founder of the Division of Geological Sciences at Caltech and its first chairman (1926-1947), was Room 151 Arms Laboratory. For years this room has not only been used for classes but for seminars, Geology Club meetings, and press conferences as well. Recently, at the suggestion of Eugene Shoemaker, the current chairman of the division, the room was refurbished and renamed. It is now the John Peter Buwalda Room, and it is decked out with a new carpet, a projection and public address system, a gallery of newly framed historic photographs of former students and

faculty of the division, and a portrait of Buwalda painted by Ferdinand van Aken.

A formal dedication of the room was held on Sunday afternoon, February 14, and Mrs. Imra Buwalda was presented with another Van Aken portrait of her husband. Three of his former students and colleagues took part in the ceremonies. C. Hewitt Dix, '27, professor of geophysics, spoke about the period during which the division was founded; Richard Jahns, '35, PhD '43, a former Caltech faculty member and now dean and professor of geology at Stanford, reminisced about the division during the 1930's; and Leon Silver, PhD '55, professor of geology, showed slides and recalled a field trip that he and other geologists took with Buwalda after the Arvin-Tehachapi earthquake in 1952.

This honor for Buwalda came, coincidentally, in the wake of the earthquake in the San Fernando Valley area on February 9—a seismological event that would have interested him professionally. Buwalda's interest in recent crustal deformations and current geological processes was a primary factor in causing the U.S. Coast and Geodetic Survey to set up a triangulation system across fault lines in southern California to measure the drift on opposite sides of faults.



Marjorie Caserio comes back to Caltech to tell women students what to expect professionally. Orchids may be few, but they are worth trying for.

A Woman in Science—Marjorie Caserio, Chemist

Back in 1956 Marjorie Beckett, a young Englishwoman with a brand-new PhD in chemistry from Bryn Mawr, arrived at Caltech as a postdoctoral fellow. In her ensuing eight-year stay here she became a senior research fellow in the division of chemistry and chemical engineering, married Fred Caserio (a postdoctoral fellow in the same division), and co-authored a book, *Modern Organic Chemistry*, with John Roberts, who was then chairman of the division.

Marjorie Caserio is now an associate professor of chemistry at the University of California at Irvine, and the department's only woman faculty member. She came back to Caltech this month to take part in a "Women in Science" seminar, one of a series of talks by women scientists about their problems and satisfactions. The series was originated by Nancy Beakel, one of Caltech's psychologists, and is sponsored by the Caltech YMCA.

Brought up in an environment in which *nice* girls didn't go into science, she compromised by attending Chelsea College in London and studying chiropody—the least arduous and most remunerative field she could find. She

soon realized that she would much rather come to grips with the tougher elements of a career in chemistry, and became the only woman in the college making that her major. Most of the others were pushing toward degrees in home economics or nursing.

Before she arrived at Caltech, Marjorie Caserio viewed herself as a second-class citizen, and as a result she didn't take advantage of the opportunities she now feels were available to her academically. But at Caltech she finally attained a feeling of professional self-respect, because she was accepted as a member of the academic community and received "recognition, opportunity, and courtesy." Paradoxically, though, there came the time when she saw no future for herself here and accepted the post at Irvine.

Dr. Caserio's research interests are primarily in physical organic chemistry with emphasis on organic reaction mechanisms, but she doubts that, as a woman scientist, she will ever be able to interest very many graduate students in working for her.

Has Marjorie Caserio's career ever conflicted with that of her husband?

Fortunately, no. Such conflicts generally arise when one of the duo gets a good job offer that involves a move and the other has to take whatever is available. Neither of the Caserios cares to leave southern California (he is a chemist with the Union Oil Company), and Fred Caserio endorses his wife's wish to do as effective a job as possible in teaching and research.

In spite of the drawbacks Marjorie Caserio describes for women scientists, she recognizes that her present career beats being a London chiropodist.