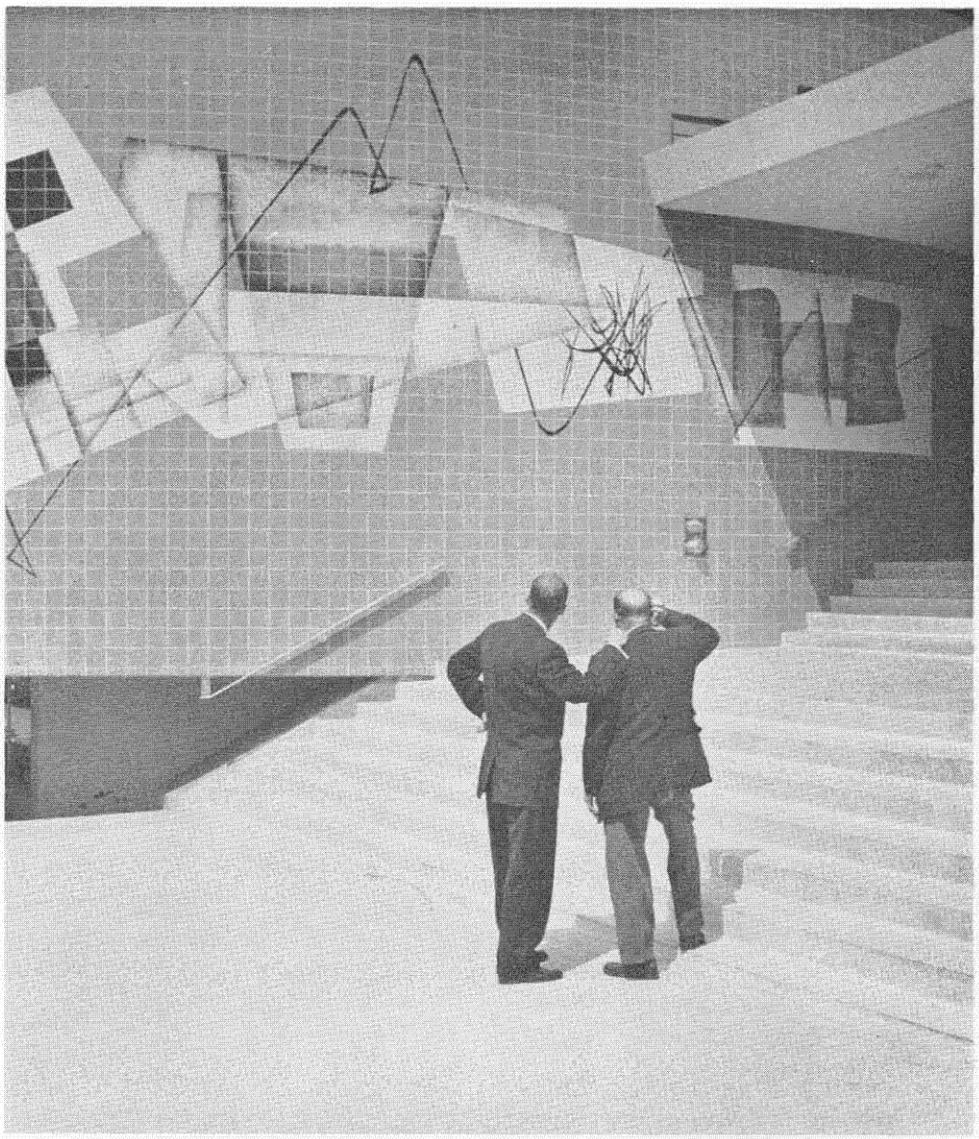

"Connoisseurs"—the Caltech Camera Club's prizewinning photograph.

THE MONTH AT CALTECH

Prizewinner

THE CALTECH CAMERA CLUB, made up of employees and staff members of the Institute, held its annual photographic exhibit on the campus last month. This year's show included the picture which was chosen Print-of-the-Year by the Southern California Council of Camera Clubs. Selected from a total of some 2500 entries, the shot was taken by William Kaup, who worked at Caltech during the war as a member of the visual presentation unit, turning out Air Force manuals dealing with long-range weather forecasting. Kaup, who is now copy chief at the Darwin H. Clark advertising agency in Los Angeles, took the prize with a picture called "Connoisseurs" (above), taken in front of the tile mural at the California State Teachers Association Building in Los Angeles.

Robert Knapp

ROBERT T. KNAPP, professor of hydraulic engineering, died of a coronary attack on November 7. He was 58 years old.

A native of Loveland, Colorado, he was graduated from MIT in 1920 and came to Caltech as an instructor in mechanical engineering in 1922. He received his PhD here in 1929. He was widely known for his work in

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hydro-dynamics and his investigations covered hydrodynamic problems of hydraulic turbines and centrifugal pumps; wave and surge problems of beaches and harbors; the mechanics of cavitation and cavitation damage; and problems of underwater ordnance, soil erosion, drainage and irrigation. The Caltech hydrodynamics laboratory was his concept, and it was developed during the war under his guidance.

In addition to his teaching and research at Caltech, Dr. Knapp served during the war as Official Investigator of the Office of Scientific Research and Development on a study of air and water trajectories of rockets, bombs and torpedoes. He was a consultant to the U.S. Army Ballistic Research Laboratory, Aberdeen Proving Ground, on hydrodynamic problems of fin and spin-stabilized projectiles.

Day Medal

HUGO BENIOFF, professor of seismology, received the Arthur L. Day Medal of the Geological Society of America at the Society's annual meeting in Atlantic City this month. The medal is awarded in recognition of outstanding contributions to geologic knowledge through the application of physics and chemistry to the solution of geologic problems.

Dr. Benioff has been associated with the Seismological Laboratory since 1924, and he has been a member of the Caltech faculty since 1937, when direction of the Seismo Lab was turned over to the Institute by the Carnegie Institution of Washington.

A graduate of Pomona College in 1921, Dr. Benioff received his PhD from Caltech in 1935. He has been known as an authority on the design of earthquake instruments since 1931, when the first Benioff seismometer was put into service. These instruments are now in operation at many stations in the United States, as well as in Peru, India, South Africa, Australia and Europe.

In his current work as a member of the IGY Technical Panel on Seismology and Gravity, *(E&S—October 1957)*, Dr. Benioff is directing studies in South America with two fused quartz extensometer installations. Measurements of secular strains, made at an adequate number of stations, over a long-enough time interval, may give sufficient information to provide a basis for the prediction of earthquakes.

Tomatoes

COMMERCIAL VARIETIES of tomatoes have always been grown most successfully in California and in a narrow geographical band running from the Midwest eastward to New Jersey. These are the principal places in the United States where night temperatures—which are critical to the tomato's flowering and fruit setting—stay within a certain optimum range, around 64 degrees F.

Now, as a result of work done in the Caltech Earhart Plant Research Laboratory, tomatoes of excellent processing quality may soon be grown commercially in areas as far south as Texas. This work was financed by the Campbell Soup Company and was directed by one of the company's plant breeders, Dr. Lester W. Schaible.

Some tomato plants grow in the far north and in the tropics. Their fruit does not compare with the best American varieties in size, flavor and color, but they tolerate night temperatures much lower and higher than ours do. By crossbreeding domestic and foreign strains, the scientists at Caltech produced plants combining the best qualities of the American plants with the temperature tolerance of the others.

The work was begun early in 1956, after a year in which unusually high night temperatures cut the eastern American tomato crop by 80 percent. Upon his arrival at Caltech, Dr. Schaible received from the Philippines the seeds of a native tomato that set small but abundant fruit despite the tropical night temperatures. He planted these and also the seeds of the Rutgers tomato—a standard American variety—and waited for them to flower. By crossbreeding, he produced a fruit whose seeds contained hybrid embryos. When these seeds were planted, they produced hybrid tomatoes—half Philippine, half Rutgers.

Dr. Schaible next inbred the hybrids. The resulting fruit contained seeds which, when planted, produced a second generation of tomato plants that showed all possible re-combinations of characteristics of the original parent plants. Some, like the original Rutgers, bore large fruit abundantly at low temperatures; some, like the original Philippine plants, bore small fruit abundantly at high temperatures; some, like the first generation plants, were hybrid in their product; a few combined the worst characteristics of both parents; and a few combined the best characteristics of both.

Selecting several plants of these last and best strains, Dr. Schaible inbred them for the production of more seeds. These, in turn, produced excellent tomatoes, in abundance, at night temperatures as high as 80 degrees F. The same strains, field tested in the south, have consistently performed as well as their laboratory prototypes.

One tomato plant normally yields enough seeds to plant an entire acre. Thus, within another five years, the field test plants should produce enough seeds so that these extraordinary tomato strains can be grown over many hundreds of acres in warm sections of the country. They may also help to stabilize the yield where tomatoes are grown commercially now.

Long-range consequences may be even more important. Dr. Schaible has shown that in the tomato plant, genes governing temperature tolerance and genes governing fruit size are independently inherited. If this is true of other plants, then the possibilities of developing special strains of food crops—tailored to climatic conditions—may be vastly increased.