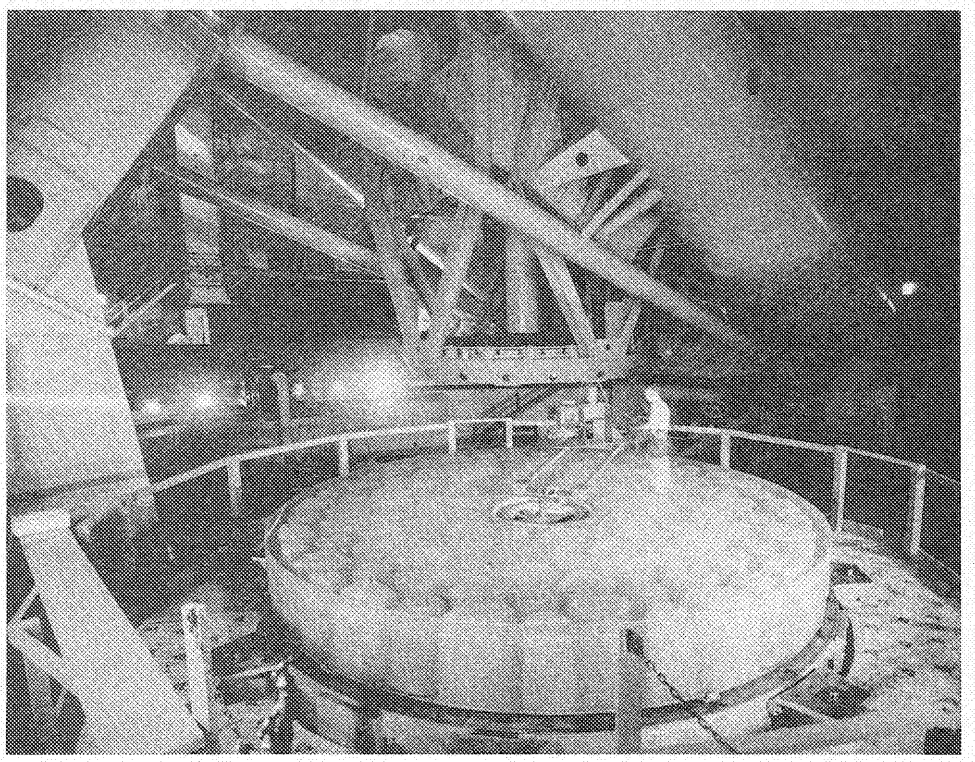
THE MONTH AT CALTECH



Polishing the 200-inch telescope mirror to remove 20 millionths of an inch of glass.

Progress Report

■ The 200-inch telescope should be back at work by the end of the year. It's been out of action since last May, when the big mirror was removed for additional polishing. Now the polishing has been completed. As soon as the mirror gets a new aluminum coating it will go back into the telescope tube and the 200-inch will get on with its job.

The mirror was removed for further polishing last spring when more than a year of testing revealed that the outer 18 inches of its surface were just about 20-millionths of an inch too high. "It had been deliberately left high," said Dr. Ira S. Bowen, Director of the Mount Wilson and Palomar Observatories, "because we had anticipated some sag when it was placed in the telescope. When this sag did not develop to the extent we had anticipated, and tests under actual operating conditions revealed that we were not getting the accuracy we desired from this portion of the mirror, we decided to do some additional work on it.

"Although we believe we have now obtained as nearly perfect a surface as possible, we cannot be absolutely certain until the telescope has been tested further under actual operating conditions. If, after a year or so, we believe we can still further improve the mirror by additional polishing, we will undoubtedly remove it again and do such additional work as we deem advisable."

Though it took five months to complete the additional polishing, only seven hours was spent in actual work on the surface of the mirror. Most of the time was taken up in exhaustive test runs, in removing and replacing the mirror in the telescope for each short polishing run, and in determining from studies of test photographs where and how much additional glass had to be removed. Weather accounted for a good deal of the time too. Since the light from distant stars was used in the testing, Dr. Bowen and his staff had to wait for the best seeing conditions and long periods of uniform temperature.

The polishing job was done by Don O. Hendrix, Mount Wilson Observatory optician who did the mirrors for the 48-inch Schmidt camera. Using polishing tools as small as 1 x 1¼ inches and as large as 12 inches in diameter, Hendrix began cautiously removing more glass from the mirror last June. The smallest tools, which were made of cork, were used by hand to remove as little as five-or six-millionths of an inch of glass in small localized areas. For larger areas, where as much as 20 millionths of an inch of glass had to be taken off, work was done by machine.

Extreme care had to be taken to avoid removing too much glass. When polishing was in progress no one except those working on the mirror had access to the observatory floor. Before each polishing run the mirror had to be thoroughly cleaned to avoid the possibility of foreign matter getting on it and scratching its surface.

"The efficiency of the mirror has been improved considerably by the additional polishing," says Dr. Bowen. "Under average seeing conditions it was good enough before we did this extra work. Now it is good enough to take full advantage of those exceptionally good seeing nights that occasionally occur. It is on these nights that the 200-inch will get in its best work and we are now in a position to take full advantage of them."

The Palomar astronomers, who first obtained pictures of stellar systems a billion light years from the earth last January, believe that the repolishing of the mirror will make it possible to photograph stars 20 percent fainter than those recorded on the first test plates. There is good reason to believe that the Hale telescope will now be able to record objects more than four million times fainter than the faintest stars you can see with the naked eye.

ACS Honors

■ At the annual fall meeting of the American Chemical Society in Atlantic City, Dr. Bruce H. Sage received the $1,000 Precision Award (E & S—Oct. '49). At the same meeting it was announced that two other members of the

Caltech faculty would be similarly honored when the Society meets again in the Spring.

Dr. A. J. Haagen-Smit, Professor of Bio-Organic Chemistry, is to receive the $1,000 Fritzche Award for "outstanding achievement in analysis, research, and new applications of essensial oils." Specifically, Dr. Haagen-Smit will be honored for his studies of the chemical composition of the gum turpentines of various species of pine, which he has been making in conjunction with the U. S. Forestry Service.

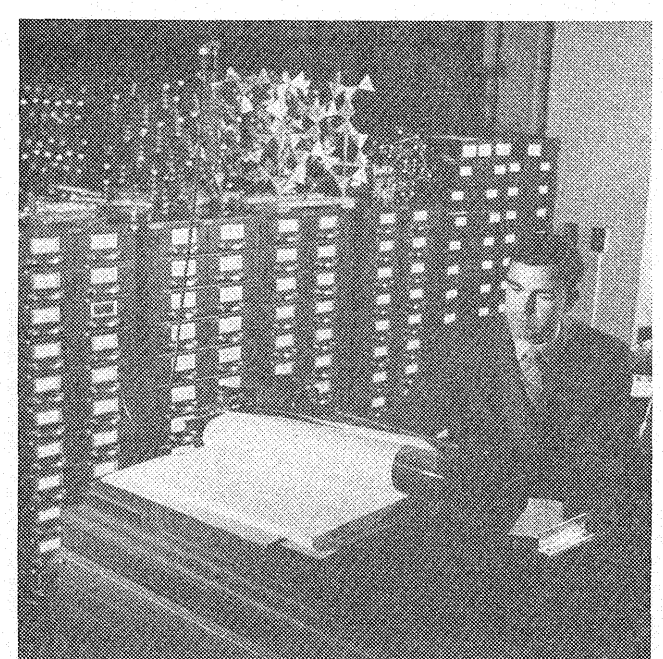
Dr. Verner Schomaker, Associate Professor of Chemistry, will receive the American Chemical Society Award in Pure Chemistry for his contribution to structural chemistry and, particularly, his determination of molecular structure in the vapor phase by electron diffraction techniques. This award, which also amounts to $1,000, was established in 1931 to "recognize and encourage fundamental research in pure chemistry carried out in North America by young men and women." First winner of the award was Linus Pauling, now head of the Division of Chemistry at Caltech and President of the American Chemical Society.

Gilbert to Germany

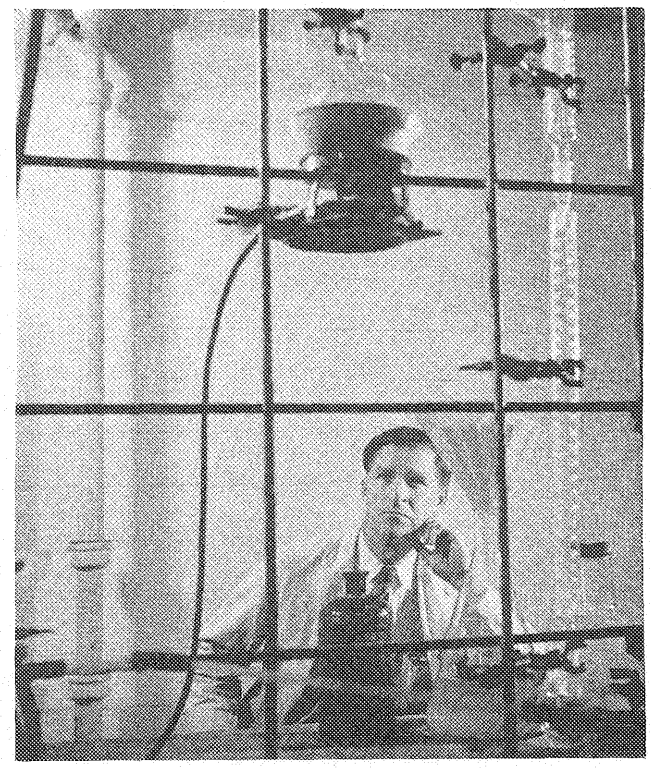
■ Horace N. Gilbert, Professor of Business Economics, has taken a year's leave of absence from the Institute to serve on the staff of the U. S. High Commissioner of Germany. Under Commissioner John J. McCloy—who succeeded Gen. Lucius Clay in the change from military to civil administration—Prof. Gilbert will work in the Office of Economic Affairs, supervising imports, exports and monetary payments made by the new Republic of Germany.

This is Prof. Gilbert's second postwar visit to Germany. In 1945 he went there as a member of the U. S. Strategic Bombing Survey appointed by President Truman. A longtime student of German affairs, Gilbert was also in that country in 1931 when the German banks closed, in 1934 when Hitler succeeded von Hindenburg as head of the State, and in 1936 when Hitler's mobilization of the nation for war was well under way.

Horace Gilbert has been at Caltech since 1929. He has served as an industrial consultant to a number of companies and as a special consultant to the U. S. Air Forces on Industrial Preparedness. During the war he was principal production supervisor for the Air Forces at Wright Field and in Los Angeles. In his new post he is stationed at Frankfurt, where Mrs. Gilbert and their three children will join him around the first of next year.



Verner Schomaker wins ACS Award in Pure Chemistry



A. J. Haagen-Smit receives the 1950 ACS Fritzche Award.

DuBridge Sidelines

■ Dr. L. A. DuBridge has been elected temporary chairman of a University Presidents Committee, set up recently to advise the Los Angeles County Board of Supervisors on rapid transit problems. The committee includes the presidents and the heads of the engineering departments of U.C., Stanford, U.S.C., U.C.L.A., and Caltech. The committee's job is to advise the Board of Supervisors on the selection of a firm of engineers to study the county's transit problem and draw up plans for a solution. An initial appropriation of $300,000 has been made to cover the costs of this engineering study.

With three other prominent civilian educators, Dr. DuBridge was also recently appointed to the Board of Visitors for the Air University at Montgomery, Alabama, by General Hoyt S. Vandenberg, Air Force Chief of Staff. The board was formed in 1946 to advise the commanding general of the school, and to report on the character, quality, and management of the Air Force educational system for officers.

Vital Statistics

■ There are 1,140 students registered at the Institute for the 1949-50 school year—443 graduates and 697 undergraduates. Of the undergraduates 197 are seniors, 168 juniors, 161 sophomores, and 171 freshmen. The freshmen this year come from 18 states and 7 foreign countries—the Argentine, Canada, Ecuador, England, Egypt, Hawaii, and the Philippines.