

ASTRONOMY—GENERAL SCIENCE

# Completion of 200-Inch Telescope Is in Sight

## One of Its Uses Will Be in Study of Radiation From Planets, Including Invisible Infra-Red Rays

COMPLETION of the great 200-inch telescope to be erected on Mt. Palomar as part of the Department of Astrophysics of the California Institute of Technology is at last in sight, thirteen years after the late Dr. George Ellery Hale convinced the Rockefeller Boards of the feasibility of such an instrument, and obtained funds for its construction.

This was announced by Dr. Max Mason, chairman of the Institute's Observatory Council, to the Pacific Division of the American Association for the Advancement of Science. He revealed

that a major headache, a sagging of the great disk of glass for the big mirror which will collect and concentrate the light of distant stars, had been overcome.

The disk, which is 17 feet in diameter and originally weighed 21 tons before some four tons of glass were removed in grinding, is solid in front, but the back is ribbed, mainly to lighten it. By a system of 36 levers, the mirror is held in the holes formed between these ribs. Both the method of support and the structure of the mirror are new in this instrument.

"The supporting system must operate

so perfectly that no bending of the reflecting surface beyond one or two millionths of an inch will occur as the telescope moves," said Dr. Mason.

"As the surface of the mirror was brought by polishing close to a spherical form it became clear that the disk, when tipped from the grinding table to a vertical position for optical test, sagged slightly under gravity," he confessed. "After months of study, as the polishing continued, this sag was eliminated by installing a system of twenty-four squeeze levers, operated by counter weights, distributed around the rim of the glass, and thus another major '200-inch headache' was cured."

*Science News Letter, June 28, 1941*

## To Study Radiations

WHEN the 200-inch telescope finally does swing into use, one of its employments will be in the study of radiations from the planets, Dr. John Strong, also of the California Institute of Technology, said. Planets not only reflect visible light which they receive from the sun; they absorb and then re-radiate considerable quantities of solar energy, largely in the form of the invisible infra-red rays. These will be caught by the great mirror, and analyzed in a number of specially constructed instruments.

These instruments, Dr. Strong informed his audience, are now being constructed, and the special techniques necessary for their operation are being developed by members of the Institute staff. Much of the information necessary for comparison of conditions on the planets with those on the earth can be obtained only by a more careful and exact study of physical processes taking place on our own planet's surface and in its atmosphere. Determinations, on an entirely new order of exactness, of what happens to earth radiations when they pass through water vapor, carbon dioxide, ozone and the major atmospheric gases, are on the program of research at the Institute.

Incidentally, Dr. Strong pointed out, data obtained in these researches will probably have considerable value to meteorologists as well as to astronomers.

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## Big, Cool, Red Stars

THE bright star Arcturus, which passes almost directly overhead these



### FOR PRECISION

*A new white, plastic finish, which will resist the combined attacks of heat, corrosive fumes and humidity, has been developed to protect dials on industrial and military instruments. In a series of tests with the "world's worst weather," created artificially, the new dials remained pure white under the most grueling conditions, while dials of the old type developed yellow splotches and other defects. Accuracy required in electrical instruments makes it necessary to print the marks on the dials with a variance of less than 1/200th of an inch. The young woman worker is mounting the dials at the Westinghouse plant.*