ASTRONOMY

100-Inch Telescope Has Speed Planned for 200-Inch Mirror

Work of 200-Inch Mirror Expected To Equal That Of 400-Inch Instrument Figured on 1928 Basis

See Front Cover

RECENT advances in optics and photography have increased the efficiency of the 100-inch Mount Wilson reflector until it has now attained the speed expected of the 200-inch when plans for its construction began in 1928. This was revealed by Milton L. Humason of the Mount Wilson Observatory staff in a statement to the Astronomical Society of the Pacific.

But he added that these gains could also be applied to the 200-inch telescope so that astronomers may look forward to a corresponding increase in power of the Mount Palomar instrument over that originally planned. While they have been building a 200-inch, the astronomers are getting a 400-inch mirror in terms of light delivered by 1928 standards.

He cited as a striking example of these improved methods the fact that for the first time a photograph has been obtained showing the center of our stellar system, the vast nucleus of stars around which our entire galaxy rotates. It is estimated that there are 800,000 stars per square degree upon the plate. The photograph was made possible by using plates sensitive to red light instead of blue. Red light is much more penetrating than blue, and thus easily pierces clouds of cosmic dust revealing stars thousands of light years away. Ordinary plates sensitive to blue light only would show stars but a few light years distant.

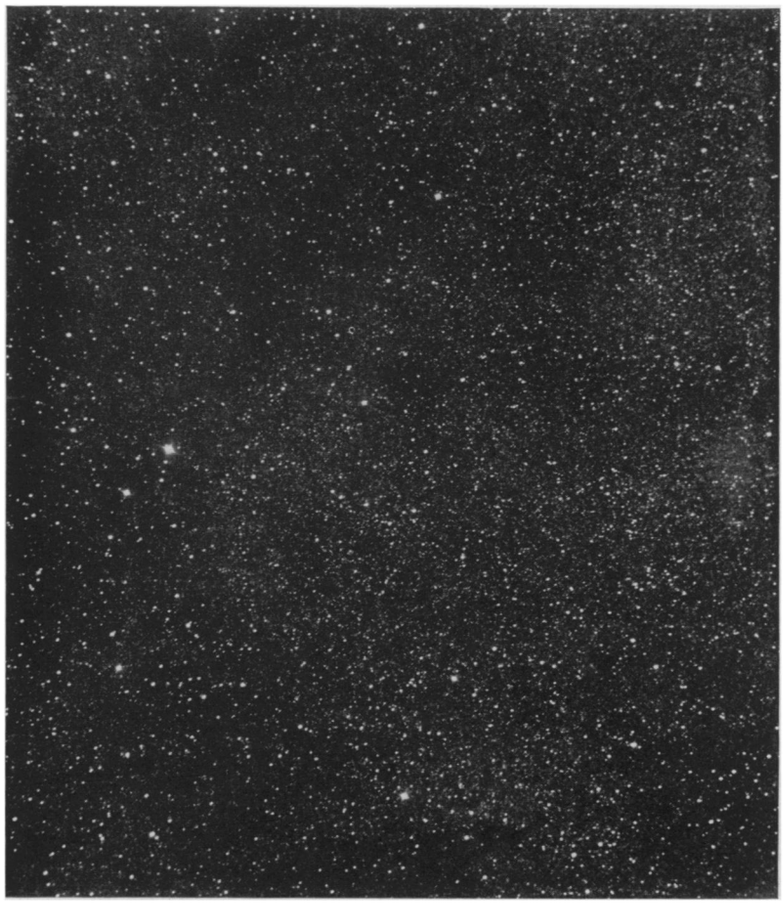
Although red-sensitive plates have been improved enormously in the last ten years there has been no corresponding gain for blue-sensitive plates. They may be speeded up slightly by "baking" them for three days in an oven at 120 degrees Fahrenheit, or by putting them in an air-tight chamber with a large drop of mercury.

In about two-thirds of modern astronomical observations it is necessary to pass the starlight through several correcting lenses before it reaches the photographic plate. Fully one-fourth of the beam is lost by reflection and scattering of light at the lens surfaces. This has been greatly reduced by coating them with non-reflecting chemical films of lithium and calcium fluorides about four millionths of an inch thick.

"An astronomer using long exposures fully appreciates the significance of these gains," Mr. Humason said. "To photograph spectra of faint extragalactic nebulae formerly required exposures from 10 to 30 hours long. Now the same spectra can be photographed in one-third the time, thus enabling the astronomer to observe three times as many nebulae."

Science News Letter, December 6, 1941

The Cleveland Museum of Natural History makes natural-looking *foliage* out of beeswax, cotton, wool and wire, using a mold to get leaf impressions and painting the wax-and-cotton molded leaf with oil paints.



GALAXY HEART IN BLUE

The photograph on the front cover is the center of our stellar system as photographed in red light through the improved 100-inch reflector of Mt. Wilson Observatory. It shows for the first time the great concentration of faint stars at the nucleus of our galaxy. Contrast it with this photograph which shows the same region in blue light. The red-light photograph on the cover is estimated to have 800,000 stars per square degree. Only globular star clusters show higher concentration. The photograph on this page shows fewer stars because blue light from the more distant stars is stopped by intervening cosmic dust. Each of these photographs by Dr. W. Baade covers an area about the size of the full moon.