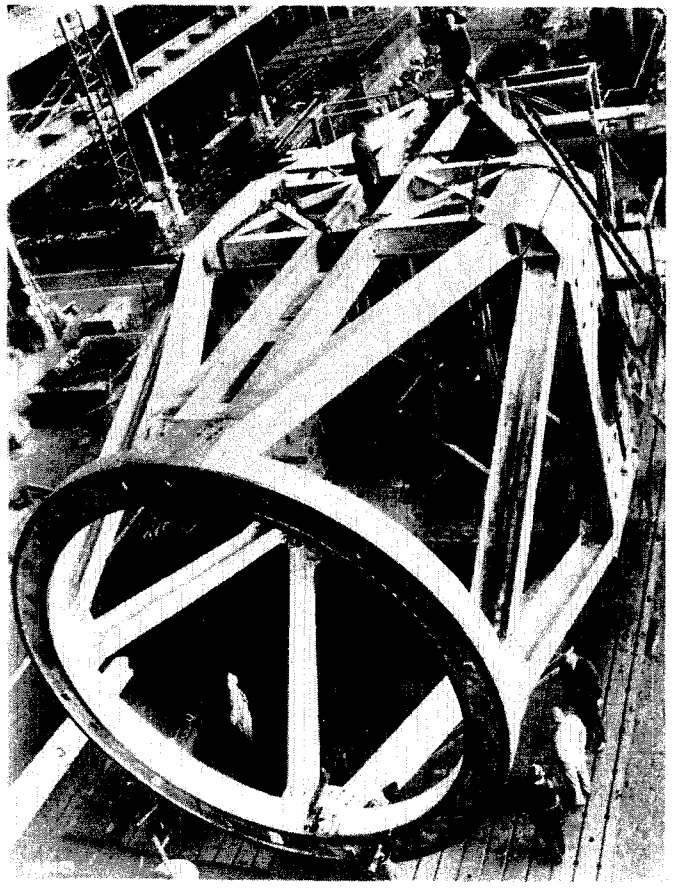

Telescope Frame During Construction at Westinghouse Plant

floor will be given over to various offices, a library, and laboratory. The mezzanine floor will contain machinery rooms for the telescope and elevator, the main switchboard, the battery room, telescope control cables and racks. The observing floor, covered by the round insulated dome with its shutters, will contain, of course, the telescope proper will all the necessary control desks, panels and equipment to operate the instrument. In addition, there will be an insulated visitors' gallery (to prevent temperature rise in the room rather than from exclusiveness), dark rooms, coudé observing room, small instrument shop, and mirror handling equipment. Stairway and elevator lead to the rotating balcony platform above, on which will be located switchboards, machinery for the shutter, wind screen in shutter opening, and the prime focus elevator which will carry observers up to the cage located at the top of the telescope tube. A stairway leading from the balcony level to the dome attic gives access to the main crane and the electrical machinery and working lights that serve in conjunction with lower wall units to illuminate the interior and floor 92 feet below. These units are heat insulated from the interior room.

The crane is a 60 ton main hoist and 5 ton auxiliary hoist that rotates as part of the dome. Electrical connection for this, along with other dome power and light, must be fed through collectors and slip rings that total about two miles long, for connections must finally be made to the switchboard room, control points, or balanced telescope cables leading to the polar axis of the telescope.

THE TELESCOPE

By M. B. Karelitz, '25

A large reflecting telescope is a complicated instrument which collects light from celestial objects and concentrates it either at its focal point, called the prime focus, or, by a series of additional reflections from auxiliary mirrors, at other focal points on the telescope convenient for direct photographic or spectrographic work.

The major advantages of the 200-inch telescope over other large instruments in existence are (1) its considerably larger light collecting capacity, permitting reduction in the time of exposures and the photographing of more distant objects in space, and (2) its design permitting astronomical work directly on the telescope tube at the prime focus of the 200-inch mirror, thus avoiding the loss of light through additional reflections that were required in the 100-inch and other smaller telescopes used to date.

In the design of the 200-inch telescope special attention is being paid to reducing the time necessary for changing the auxiliary mirror combinations for work at different focal points. Instead of changing cages at the top of the tube in order to use the different auxiliary mirrors, as has been done up to the present, all mirrors will be permanently located on the telescope and will be swung in and out of position by means of motorized mechanisms. Not only can the auxiliary mirrors be placed by pushing buttons, but even the telescope itself can be set into the desired field of vision automatically.

In its optical and mechanical parts such as bearings, drives, etc., the 200-inch telescope differs materially from the older ones, since recent advances in different engineering fields can be incorporated in their design.

The large size and necessary accuracy of the component parts of the telescope require machines and equipment of unusual size. Special machines for cutting the large driving gears had to be built on the campus. The tube proper, the mounting and bearing assemblies of the telescope are being manufactured by the Westinghouse Electric and Manufacturing Company at its S. Philadelphia and E. Pittsburgh plants. Even there large machine tools had to be modified and a huge annealing oven had to be installed. Smaller parts, especially those requiring great accuracy, are being manufactured in the Astrophysics Instrument Shop on the campus.

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THE SCHMIDT TELESCOPE

William H. Pickering, '32

The first astronomical instrument actually installed and put into operation on Palomar is an 18" Schmidt telescope which took its first photograph on September 5, 1936. This telescope is a new type of instrument designed for photographing large areas of the sky. It is essentially a camera with an 18" lens working at an aperture of F2. By astronomical standards it is also a very wide angle lens. Actually the field of view is about 10° in diameter. This field is free of distortion to the very edge. By taking forty minute exposures, objects down to about magnitude 17.5 can be photographed.