Schmidt Cameras - Blazing the Trail

OVERSHADOWED by their big brother, the 200-inch, are the Schmidt Cameras atop Palomar Mountain. There are three of these—the small 8-inch, an 18-inch, and the 48-inch. The latter, like the Hale Telescope, is the largest of its kind in the world, and as a team these two will be unequalled by any other pair of astronomical tools in existence today.

Named for their inventor, Bernard Schmidt, an Estonian-born optician who did most of his work in Germany, these cameras are already playing a vital role in astronomical research.

The remarkableness of these instruments lies in the fact that they combine a large field of view with very high speed, or put another way, they are extremely fast wide-angle cameras.

The 18-inch Schmidt has been in operation for several years and to date its most important contribution to astronomy has been that of photographing supernovae, or exploding stars. Nearly twenty of these stars have been photographed by the 18-inch Schmidt. At the present time its program calls for making a photographic survey of our own milky way, a project for which such cameras are particularly suited.

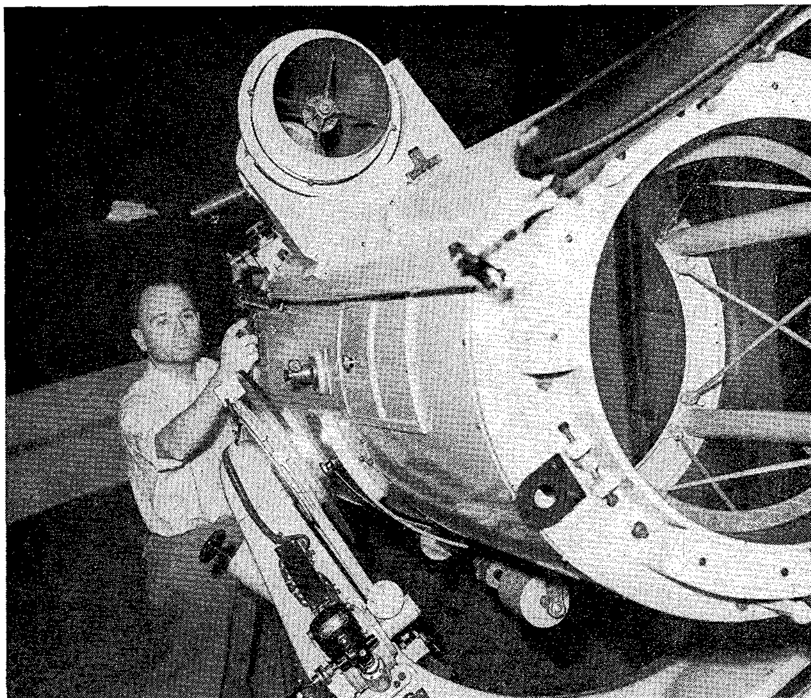
The 48-inch Schmidt in its initial program will be used for mapping of the entire skies as they can be observed in this hemisphere and it is estimated that this will require from two to three years to complete. Its principal advantage over the smaller 18-inch will be its ability to reach farther into space. It is from studies of photographs taken by the Big Schmidt, as it is commonly referred to, that astronomers using the 200-inch Hale will determine much of the work to be done with that telescope. This then, places the Schmidt in the position of acting more or less as a "scout" for the 200-inch—a sort of astronomical bird dog that locates the game after which the 200-inch as the hunter takes over to make the kill.

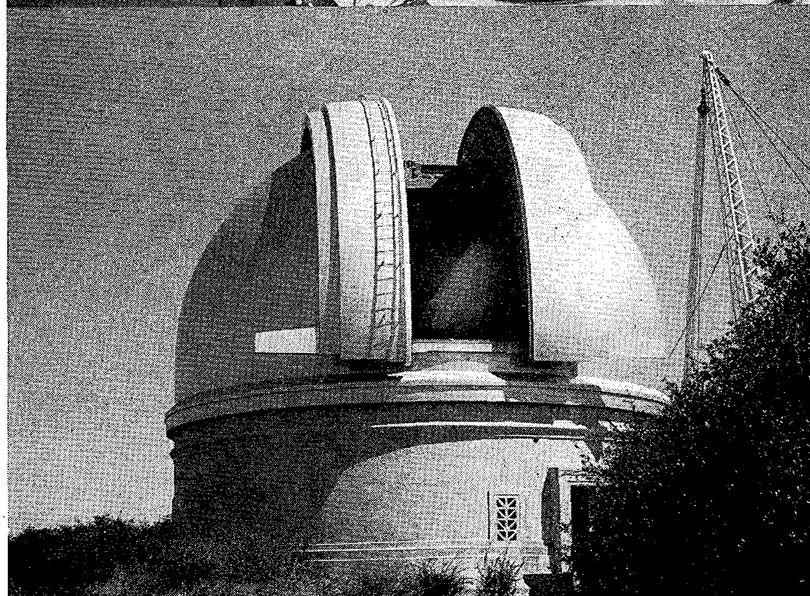
With a focal ratio of f 2.5 the Big Schmidt can cover an area of the sky nearly three thousand times greater than the 200-inch.

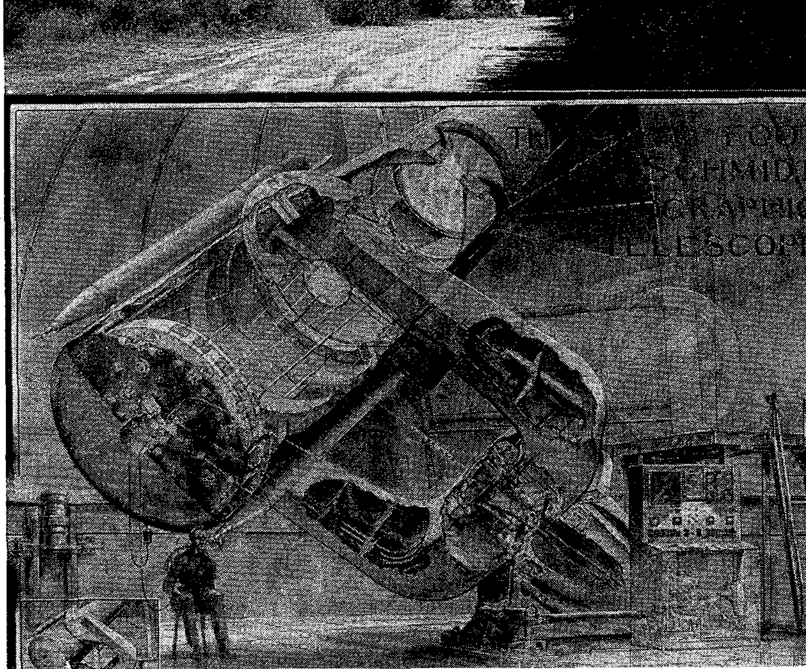
The principle by which the Schmidt camera functions is a relatively simple one. At the end of the tube which points to the sky is a correcting lens, the purpose of which is to bend incoming light rays from a star field so that they will strike the camera mirror, located at the other end of the tube, in such a manner that all rays will come to focus on a common plane. The photographic plate is located approximately midway between the mirror and the correction plate.

Two different size plates will be used in the 48-inch, one 10 x 10 inches and another 14 x 14 inches. Circular plates are used in the 18-inch but square ones will be used in the 48-inch so that a minimum of difficulty will be encountered in fitting plates together to obtain the sky map.

Although the Big Schmidt is nearly completed, it will not be finished and go into operation until after the 200-inch Hale begins its first research program.







UPPER: Dr Josef J. Johnson operating the 18-inch Schmidt telescope.

CENTER: The 48-inch Schmidt dome, looking east.

LOWER: The 48-inch Schmidt telescope. At the end of the tube is a 48-inch correcting plate, through which starlight passes to the 72-inch mirror. It is then reflected to the photographic plate at the focus (center). Drawing by R. W. Porter.