THE REFLECTING ZENITH TELESCOPE.

By JOSÉ ALGUÉ, S. J.

PART I.

DESCRIPTION OF THE INSTRUMENT.

1. *Double Telescope.* The construction of the instrument may be gathered from an examination of Plate V. In appearance it is not unlike a transit instrument, but it has two object-glasses, one at each end of the same tube, forming a double telescope.

The objectives, by Brashear, are almost exactly alike. They have a clear aperture of 10.5 cm. and a focal length of about 64 cm. This particular focal length was adopted in order to secure the trails of stars of the 7th photographic magnitude, and to diminish flexure of the telescope. These two lenses have a common focal plane in the interior of the central cube, where sensitive plates are placed. For the purpose of further diminishing flexure, four metal braces extend from near the cell of either object-glass to projecting arms on the corresponding edges of the cube. Cone-shaped tubes of some alloy of aluminum would seem to be preferable. The handles near the objectives are intended to facilitate the setting and moving of the telescopes. There is no eyepiece, and the instrument is exclusively photographic.

It is intended primarily for latitude determinations by the usual method of equal meridian zenith distances, but it may also be used as a transit for time observations. In the former case both object-glasses are indispensable; one receiving the light of the star directly, the other by reflection; in the latter, either lens will serve the purpose. The instrument is provided with a striding level and a reversing apparatus. For latitude determinations alone the latter is not needed, though it may be used. (See page 70.)

2. *Plate-holder and Reticle.* The plate-holder consists of a thin glass plate, firmly secured to a brass frame-work near the centre of the cube. One of its faces is in the common focal plane of the two objectives. The sensitive plate is placed with its film in contact with