

APPENDIX I.

DESCRIPTION

OF THE

TRANSIT CIRCLE

OF THE

UNITED STATES NAVAL OBSERVATORY.

PART I.

DESCRIPTION OF THE INSTRUMENT AND ITS ADJUNCTS.

GENERAL DESCRIPTION. (PLATE III.)

(1) The instrument is mounted in the west wing of the Observatory, the room formerly occupied by the Transit Instrument. The interior dimensions of the room are 24.3 feet from east to west, and 18.4 feet from north to south. On the north and south sides of the room are built two recesses, each six feet in length, and six in depth, to make room for the collimators. The slits in the wall and roof for observing are thirty inches in breadth, and closed by four shutters on the roof, and a door on each side.

(2) The piers are solid monoliths of marble. The form of each pier is that of a frustrum of a pyramid, surmounted by a prism. The base at the floor measures 44 inches from north to south, and 38 inches from east to west. The top of the pyramidal portion is 80 inches above the floor, and measures 18.5 inches from north to south, by 24.5 from east to west. The dimensions of the making horizontal sections of the prism are the same, while the height of the prisms is 28 inches; the whole height of the piers 9 feet above the floor. The inside faces of the piers form a vertical continuous plane 19 inches in breadth, and 9 feet in height. On each side of this plane the stone is cut away in the form of a section of a hollow cylinder. The distance of the inside faces is 54 inches. A cylindrical hole 5 inches in diameter is cut from east to west through each pier for the illumination.

Into these openings the inside ends of hollow brass cylinders are firmly set with plaster to the depth of 3 inches. The outside end of each cylinder expands into a disk $8\frac{1}{2}$ inches in diameter and 0.7 of an inch from the face of the pier. The arms which carry the four reading microscopes of each circle are attached to these disks, radiating from the central axis at an angle of 45° from the horizontal and vertical directions. Within each disk, near its centre, is a system of prismatic reflectors for illuminating the divisions of the circle. The illuminating lamps are each at the large end of a conical tube, the small end of which extends through the opening of the pier and fits into the interior of the cylinder carrying the microscope disks. The large end, carrying the lamp, extends three feet from the outer face of the pier. One lamp illuminates the field of the telescope, the other the wires.

The Ys are fastened into semi-cylindrical pieces of brass which extend inward from the head of the disk carrying the microscope arms, the axis of the cylinder being a continuation of that of the openings in the pier, as shown in Plate IV.