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## THE NEW PRINCETON TELESCOPE.

The accompanying engraving shows the great telescope of the College of New Jersey, as it stands in Halsted Observatory at Princeton. It ranks fourth in the list of great refractors in use, and is by far the largest belonging to any collegiate institution.

Halsted Observatory was built some fourteen years ago, at a cost of about \$56,000. In making the alterations necessary for the reception of the new telescope some \$5,000 more have been expended. The telescope and its accessories cost \$26,000. This sum was contributed by the friends of the college; the largest donors being Robert Bonner, Esq., and the late R. L. Stuart, who gave respectively \$10,000 and \$6,000.

The telescope was made by Alvan Clark & Sons, of Cambridgeport, Mass.; and all the appointments of the observatory are of the most modern character. The iron dome, under which the telescope is mounted, is 39 feet in diameter. The apparatus for turning the dome and opening the shutter is driven by a four horse power gas engine, which also actuates a small (Edison) dynamo machine for operating the electric lamps used in illuminating the building and furnishing electric currents for various spectroscopic purposes.

The following data respecting the telescope have been kindly furnished by Professor C. A. Young:

The diameter of the object-glass is 23 inches. The radius of the curvature of the crown glass lens, outside surface, is 265.8 inches; inner surface, 81.9 inches. These surfaces are both convex. The flint glass lens (concave on both sides) has for the surface next the crown lens a radius of 73.4 inches. That of the surface next the eye is 223.2 inches. The distance between the lenses is 7.5 inches. The focal length is 30 feet 1 inch. The steel tube of the telescope has a length of 28 feet and a diameter of 33 inches in the middle. The length of the polar axis is 10 feet; diameter at bearings, 8 inches and 6 inches. The diameter of the coarse hour circle is 30 inches; of the fine hour circle, 28 inches. The length of the declination axis is 9 feet; its diameter at bearings, 7½ and 5½ inches. The diameter of the declination circle is 30 inches.

The driving weight of the clockwork weighs 320 pounds, and has a fall of 12 feet. The radius of the sector by which the clockwork drives the telescope is 40 inches. The centrifugal regulator or governor weighs 22 pounds, and revolves once in seven-tenths of a second. The weight is taken off the lower pivot by floating the regulator in mercury. The weight of the telescope and mounting is about seven tons. The height of the center of motion above the floor is 20 feet 9 inches. The declination circle is read from the eye end of the telescope by microscopes 9 feet long.

The telescope is provided with position and double-image micrometers of the best construction. The star spectroscope, by Hilger, of London, was constructed under the supervision of Mr. Cristie, the Astronomer Royal, upon the same plan as that of the instrument for some time in use at Greenwich, but upon an enlarged scale. It is a direct-vision instrument, with three (so-called) half-prisms. It is more than 6 feet long,

and weighs, with its appendages, about 150 pounds. For the present it is expected this telescope will be devoted mainly, though not exclusively, to stellar spectroscopy.

For the purpose of comparison the following facts with regard to other large refracting telescopes will be found of interest. But two instruments excelling the Princeton telescope are now in use, namely, the 25-inch telescope made by Cooke, of England, and owned by Mr. Newhall, of Newcastle-on-Tyne; and the 26-inch equatorial, made by the Clarks, at the Naval Observatory, Washington. The third larger instrument, made by Grubb, of Dublin, and having an aperture of 27 inches, is now in process of mounting at Vienna.

The instrument nearest in size below the Princeton telescope, now in use, is the Strassburg refractor, with an aperture of 19 inches.

There are in process of construction five larger instruments, namely:

The Pulkowa telescope, 30 inches, and the McCormick telescope, 26¼ inches; both by the Clarks. The Henry Brothers, in Paris, are making a 29 inch telescope for the Nice Observatory, and another, of the same size, for the National Observatory at Paris. One of the disks of glass (the crown) for the Lick telescope, to be 36 inches in diameter, has been received by the Clarks, who are waiting for the flint disk before beginning the grinding. This gigantic instrument, when finished, is to be erected on Mount Hamilton, California.

## The Transit of Venus.

A scientific party has lately been sent, under the auspices of the government, to Capetown, South Africa, to observe the transit of Venus, which will occur on December 6. The party consists of Professor Simon Newcomb, U. S. N.; Lieutenant Casey, United States Engineers; Ensign J. H. L. Holcombe, U. S. N.; and Julius Ulke, photographer. The party expect to take the steamer from Southampton to Capetown on October 5, due at the latter port about November 1. At Capetown the party will make its headquarters near the English observatory, and will take artificial observations daily preparatory to the work in connection with the transit.

## The Largest Electroplating Establishment in the World.

Professor Silliman, of Yale College, pronounces the electroplating establishment lately acquired by the Postal Telegraph Company, at Ansonia, Conn., the largest in the world; yet its capacity is soon to be trebled. The works are employed in copper plating the steel wire used in the company's system of telegraphy, and now deposit two tons of pure copper a day. The steel core of the wire gives the required tensile strength, and the copper covering extraordinary conducting power, reducing the electrical resistance to such a degree, the company claim, that San Francisco may be brought, telegraphically, nearer New York than Chicago is now.

When the plant is completed, three three-hundred horse

power engines will drive dynamo machines to supply current for electroplating thirty miles of wire a day, the wire carrying five hundred pounds of copper to the mile. In the process of coating the wire is drawn slowly over spiral coils through vats containing copper in solution, until the proper thickness of deposit is obtained.

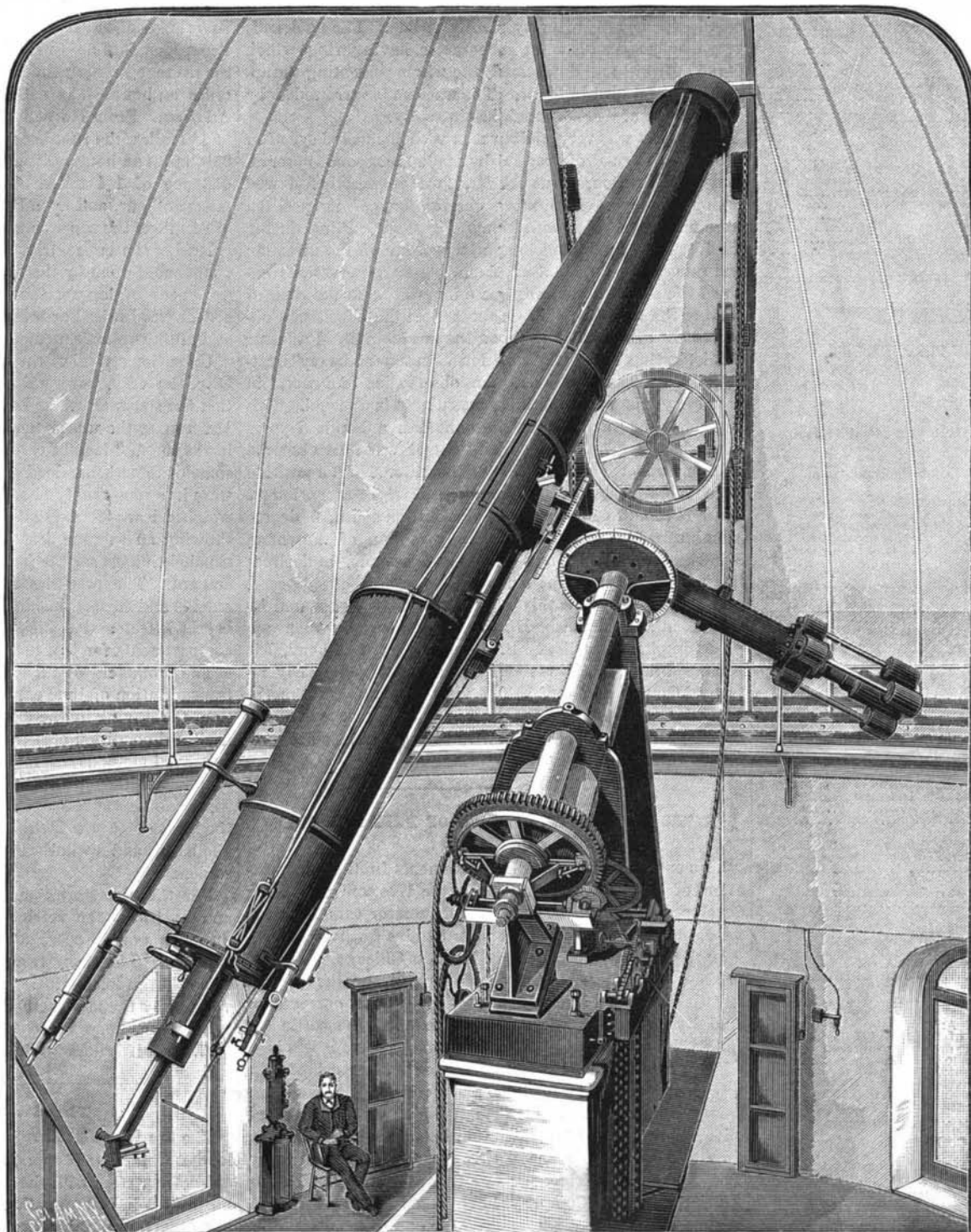
The first line of the Postal Telegraph Company will run from New York to Chicago by way of Binghamton, Elmira, Corry, Pa., and Cleveland, Ohio; but there will be no way stations, the company preferring to do what is called "trunk line" service. The lines will be constructed with forty poles to the mile, and are to be completed by December. A line is promised to Boston by the same date.

## The Fastest Trip to Europe.

The Guion Line steamer Alaska, Captain Murray, which sailed from New York September 12, for Queenstown and Liverpool, was signaled passing Fastnet at two o'clock Sept. 19. She made the trip in six days fifteen hours and nineteen minutes.

This is the fastest trip ever made between America and Europe. The next fastest time was made by the Alaska—namely, six days twenty-two hours and ten minutes to Queenstown.

A "SWALLOW'S REST" of remarkable size at Westerly, Rhode Island, has attracted the attention of bird lovers. The birds are mainly the common white-breasted barn swallow, some marten swallows being occasionally seen among them. One observer estimates their number at 3,000,000 nightly in the grove.



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