

this ingenious plan will work. It will certainly have the advantage that a slow motion can be given with less expenditure of power than on any other system; but if the motion is at all rapid I am inclined to suspect that the friction of the fluid will be equal to that of the rollers on the other system. The difficulty which I should principally fear is the leaking of the caisson. The freezing of the water will be avoided by impregnating it with chloride of magnesium. It is intended to construct a dome on this principle 20 meters in diameter for the great refracting telescope now being constructed. It is feared, however, that the practical completion of the work will be long postponed, owing to the necessity of finding a better foundation for the structure than is now afforded by the grounds of the observatory.

THE GREAT RUSSIAN TELESCOPE.

In 1879 Privy Counselor Otto Von Struve, director of the Pulkowa Observatory, visited this country and contracted with the Messrs. Clark for the construction of an objective 30 inches in aperture. It was completed and delivered during the year 1882. The mounting is now being completed by the Messrs. Repsold, of Hamburg. Although still unfinished, I was desirous of gaining all the information possible respecting its construction, and therefore visited Hamburg for the purpose of examining its parts. The following are some essential points in the structure:

The most striking feature of the instrument will be the absence of friction rollers from the declination axis. With so large an instrument the friction on the declination axis will be too great to admit of the telescope being conveniently turned either by hand or by a rope attached to the two ends, as at Washington and Vienna. The quick motion in declination will be given by a system of cog-wheels turned by an axis passing through the polar axis of the instrument and coincident with it. This axis will be turned by a crank at the lower end, or by the observer taking hold of the circumference of a wheel, at choice. Although the turning of the crank is a more convenient motion for the purpose than that of taking hold of the handles of a steering-wheel, I do not consider it so convenient as pulling a rope. This system of wheel-work will also be connected with the axis of a crank at the eye-piece which the observer can take hold of and turn without leaving the eye-end of the telescope. A second crank will be furnished for the motion in right ascension.