the Earth, viz.: 8 minutes and 18 seconds very nearly, affords another independent proof that the commonly received distance is too great by about $\frac{1}{30}$th part. The value of the Solar parallax indicated by this method is 8″.86.

The great eccentricity of the orbit of Mars causes a considerable variation in the distance of this planet from the Earth at the time of opposition. Sometimes its distance from the Earth is only a little more than one-third of the Earth's distance from the Sun. Now, if Mars when thus favorably situated, be observed on the meridians of places widely differing in latitude—such as Dorpat and the Cape of Good Hope—and if the observations be reduced to the same instant by means of the known velocity of the planet, we shall, after correcting for refraction and instrumental errors, possess data for determining with a high degree of accuracy, the planet's distance from the Earth, and thence the Sun's distance and parallax. The oppositions of 1860 and 1862, were very favorable for such observations, and attempts were made at Greenwich, Poulkova, Berlin, the Cape of Good Hope, Williamstown, and Victoria, to determine the Solar parallax at those times. The mean result obtained from these observations, was 8″.95 which agrees exactly with the theoretical value of the parallax previously obtained by M. LeVerrier.

Hence, we find that a diminution in the Sun's distance, as commonly received, is indicated, 1st, By the investigation of the parallactic equation in the lunar theory by Professor Hansen and the Astronomer Royal, Professor Airy; 2nd, By the lunar equation in the theory of the Earth's motions, investigated by M. LeVerrier; 3rd, By the excessive motions of Venus's nodes, and of the perihelion of Mars, also investigated by the same distinguished astronomer; 4th, By the velocity of light, which is 183,470 miles per second, being a decrease of nearly 8,000 miles; and 5th, By the observations on Mars during the oppositions of 1860 and 1862.

A diminution in the Sun's distance will necessarily involve a corresponding change in the masses and diameters of the bodies composing the Solar system. The Earth's mass will require an increase of about one-tenth part of the whole.

Substituting LeVerrier's solar parallax (8″.95) in Eq. (38),