length. The necessary observations were made at the time of the last "transit" in 1769, and will no doubt be repeated on the next occasion of the same kind, in 1874.*

(10.) From the distance of the sun so obtained, and from its apparent size (or, as astronomers call it, its angular diameter), measured very nicely by delicate instruments called micrometers, the real diameter of the sun has been calculated at 882,000 miles, which I suppose may be taken as exact to a few odd thousands.

(11.) Now, only let us pause a little, and consider among what sort of magnitudes we are landed. It runs glibly over the tongue to talk of a distance of 95,000,000 of miles, and a globe of 880,000 miles in diameter, but such numbers hardly convey any distinct notion to the mind. Let us see what kind of conception we can get of them in other ways. And first then, as to the distance. By railway, at an average rate of 40 miles an hour one might travel round the world in 26 days and nights. At the same rate it would take 270 years and more to get to the sun. The ball of an Armstrong 100-pounder leaves the gun with a speed of about 400 yards per second. Well, at the same rate of transit it would be more than thirteen years and a quarter in its journey to reach the sun; and the sound of the explosion (supposing it conveyed through the interval with the same speed that sound travels in our air), would not arrive till half a year later. The velocity of sound, or of any

* The distance above stated is that which results from this more precise mode of procedure. See this explained in Lecture V., § 17.