another of *expansion* by which they return to their places, these waves, 256 in number, being all comprised in, and exactly filling the distance (1090 feet) run over by sound in that time, each entire wave will occupy 4·254 ft. And, *vice versâ*, if we knew this *à priori* to be the wave-length, we should rightly conclude 256 to be the number of complete vibrations or pulses per second.

(94.) Mechanical processes enable us to grind and polish a glass surface into the segment of a sphere of any required radius—as well as to a plane almost mathematically true. Suppose such a glass surface worked, we will say, to a sphere of 100 feet radius, to be laid (convexity downwards) on a truly plane glass. The coloured rings will be formed, as above described, about a central dark spot; and if illuminated, instead of ordinary daylight, by the prismatic rays, in succession, a series of simply bright and dark rings of the several colours in their order will be formed, whose diameters in different series will correspond to their respective tints. Under these circumstances, the linear measurement of these diameters may be performed with ease and with great precision. Now these diameters are the *chords* of arcs of a circle on a radius of 100 feet represented in fig. 7, by the horizontal lines, the *versed sines of whose halves* corresponding (represented by the perpendicular lines) are the distances between the glasses at those points, or the thicknesses of the interposed film *of air*, and are easily calculated when the radius and the chords are known. On executing the measurements it is found that these distances, reckoning outwards and commencing with the