

experiment. If water, oil, or any other liquid be introduced between the glasses, the rings are observed to shrink in diameter, and the more so (and to the exact extent required by theory) the greater the refractive power of the liquid.

(97.) If the sensation of colour be, in analogy to that of tone or musical pitch, dependent on the frequency of the vibrational movements conveyed to our nerves of sensation, it becomes highly interesting to ascertain their *degree of frequency*, in order to establish the relation between the two senses of hearing and seeing in that respect. The ear, we know, can discriminate tones only between certain limits, comprising about nine octaves, the lowest sound audible as a note making about 16, and the highest about 8200 vibrations per second. Taking the velocity of light (as above) at 186,000 miles* per second, and reckoning 33,866 wave-breadths to the inch for the extreme red, 43,197 for the soda-yellow, and 70,555 for the extreme violet, we find for the impulses on the retina per second which produce these sensations of colour, respectively, the following enormous numbers:—

Extreme red,	.	.	.	399,101,000,000,000
Soda-yellow,	.	.	.	509,069,000,000,000
Extreme violet,	.	.	.	831,479,000,000,000

These extremes are nearly in the proportion of 2 to 1, so that the whole range of visual sensation on this view of the subject is comprised in about one octave. If the

* Roughly, 1000 million feet.