http://www.geology.19thcenturyscience.org/books/Bridgewater-Treatises/index.html

duce impressions on the extremities of the nervous filaments, which are spread over the membranous labyrinth; and these impressions being conveyed to the brain, are immediately followed by the sensation of sound.

With regard to the purposes which are answered by the winding passages of the semicircular canals, and cochlea, hardly any plausible conjecture has been offered; yet no doubt can be entertained that the uses of all these parts are of considerable importance, both as to delicacy and correctness of hearing. There is an obvious correspondence between the positions of the three semicircular canals, (two of which are vertical, and one horizontal, and of which the planes are reciprocally perpendicular to one another,) and the three dimensions by which the geometrical relations of space are estimated; and it might hence be conjectured that the object of this arrangement is to allow of the transmission of vibrations of every kind, in whatever direction they may arrive. It is not an improbable supposition that the return into the vestibule, of undulations which have passed through these canals, has the effect of at once putting a stop to all farther motion of the fluid, and preventing the continuance of the impression which has been already made on the nerves. The same use may be assigned to the double spiral convolutions of the tubes of the cochlea; for the undulations of the fluid in the tympanic tube, received from the membrane of the fenestra rotunda, will meet those proceeding along the vestibular tube, derived from the membrane of the fenestra ovalis, and like two opposing waves, will tend to destroy one another. Thus each external sound will produce but a single momentary impression; the prolongation of the undulations of the fluid of the labyrinth being prevented by their mutual collision and neutralization.*

* The preliminary steps in the process above described are not absolutely essential to hearing, for many instances have occurred in which the power of hearing has been perfectly retained after the membrane of the ear-drum, and also the ossicula had been destroyed by disease. A small aperture in the membrane does not interfere with its power of vibration; but if the whole