hope to give a complete solution till our knowledge has advanced much beyond its present condition.

Indeed, in the science of Acoustics there is a vast body of facts to which we might apply what has just been said; but for the sake of pointing out some of them, we shall consider them as the subjects of one extensive and yet unsolved problem.

CHAPTER VI.

Problem of Different Modes of Vibration of Bodies in General.

NOT only the objects of which we have spoken hitherto, strings and pipes, but almost all bodies are capable of vibration. Bells, gongs, tuning-forks, are examples of solid bodies; drums and tambourines, of membranes; if we run a wet finger along the edge of a glass goblet, we throw the fluid which it contains into a regular vibration; and the various character which sounds possess according to the room in which they are uttered, shows that large masses of air have peculiar modes of vibration. Vibrations are generally accompanied by sound, and they may, therefore, be considered as acoustical phenomena, especially as the sound is one of the most decisive facts in indicating the mode of vibration. Moreover, every body of this kind can vibrate in many different ways, the vibrating segments being divided by Nodal Lines and Surfaces of various form and number. The mode of vibration, selected by the body in each case, is determined by the way in which it is held, the way in which it is set in vibration, and the like circumstances.

The general problem of such vibrations includes the discovery and classification of the phenomena; the detection of their formal laws; and, finally, the explanation of these on mechanical principles. We must speak very briefly of what has been done in these ways. The facts which indicate Nodal Lines had been remarked by Galileo, on the sounding board of a musical instrument; and Hooke had proposed to observe the vibrations of a bell by strewing flour upon it. But it was Chladni, a German philosopher, who enriched acoustics with the discovery of the vast variety of symmetrical figures of Nodal Lines, which are exhibited on plates of regular forms, when