

case of our coloured rings, it must be mentioned that in reckoning the number of undulations or semi-undulations by which the second reflected ray actually is in arrear of the first on emergence, we have to consider the different modes in which the reflexion of a wave is accomplished at the surface of a medium denser or rarer than that in which it moves and is reflected. To present this clearly, we will take the most familiar illustration—that of the propagation of motion by the collision of elastic balls. Imagine a great number of equal ivory balls (supposed perfectly elastic) *in contact*, but *connected* only by an elastic string passing centrally through each and along the common axis of all; and pinned or fastened to each *at its centre* so that the separation of any two shall stretch only that part of the string between their centres. Suppose now that a shock is given to the extreme ball at one end in the direction of the common axis, by another similar and equal detached ball driven against it. By the received laws of elastic collision it will give up *its whole motion* to that which it first strikes, and be itself reduced to rest. In like manner the motion so communicated to the first will be handed on undiminished to the second; itself resting *and therefore* remaining in contact with the striking ball, and so on. Thus what may be termed a “wave of compression,” will run along the series till it reaches the ball at the other end. This, having none in front to communicate its motion to, will start off; and, were it free, would quit the series. But this it cannot do, by reason of the elastic thread; which however it will stretch in its effort to do so, and be ultimately brought back