a point Q from Ox, Oy indicate the position of the moving point P at a certain time. Thus if these distances be 3 and 4 respectively, P will be at a distance 3 inches from O in 4 seconds. If these distances are known at every instant, Q will trace out a continuous line, straight or curved, and the whole motion of P will be exhibited. The same method may be employed to indicate the gradual changes to which any quantity is subject in time. Thus Ox may represent, as before, the line of times, and vertical distances may represent the changes above or below the average pressure of the atmosphere. In all these cases, when the scales of length and time are given, it is an easy matter to interpret the auxiliary figure, whether the line of points be straight, curved, or broken. Let us now apply this method to represent the motion of a particle of a tuning fork. If Oy be the amplitude, and OA the time, of a complete vibration, say the one hundreth part of a second, the motion during one second will be represented by a curve of a wavy form, with 100 crests above OA and a corresponding number of hollows below. If the vibration is uniformly sustained, the amplitude remains the same, that is to say, the crests and hollows remain of the same height and depth respectively; otherwise they diminish and ultimately vanish. These curves are best obtained mechanically by the aid of a fork provided with a tracer on one of its prongs. The fork, being excited, is drawn so that the tracer draws the curve on a piece of smoked glass; or a strip of smoked paper may be moved under the tracer whilst the fork remains fixed, as in one form of the chronograph. This graphical mode of representing the motion immediately discloses its most important feature, namely, its isochronism; for you will have observed that whether the amplitude is diminishing or not, no change is made in the intervals between the points where the curve crosses the line of times—in other words, the time of vibration is independent of the amplitude. This fact depends on the circumstance that the force which solicits a particle in this case varies simply as the distance from its mean position. The effect of such a variable force is so to change the velocity from point to point that the particle reaches its mean position in the same time, no matter to what distance it is drawn aside. You are all familiar with the example of the pendulum, in which this isochronism is approximately realized. In the case of the cycloidal pendulum the vibrations are rigorously isochronous; the time of reaching the mean position being independent of the starting point. Now, in this respect, the vibrations of the tuning fork are similar to those of the pendulum, its vibrations being, in fact, generally called *pendular*. Whether it be excited by a violent blow or the most gentle bowing, the time of vibration is the same for the same fork. In other words, the number of vibrations executed in a second are the same, whether their amplitudes are large or small. As the number of vibrations determine the pitch, the same fact is otherwise expressed by saying that the pitch of a fork is constant. In order to complete the description of a fork's motion, it will be necessary to go a little further and inquire how the fork is moving as a whole. Ordinarily the prongs approach and recede in turn, each moving round the stem as a hinge. They are, however, capable of executing more complex movements, the nature of which will be apparent if we first examine some of the modes in which a straight bar can vibrate transversely. We may have, for example, in a straight bar free at both ends, vibrations in which the number of nodes, or stationary points,