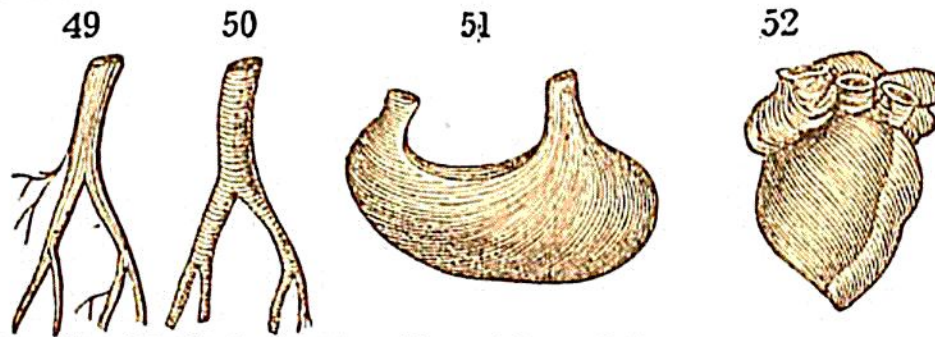


the circumference, and the radiating fibres in the interior of the sucker, (see Fig. 48;) so that, while the margin of the disk is closely applied to the object, the force resulting from the contraction of the circular fibres is exerted to remove the central portions from the surface of attachment, and thereby tends to create a vacuum underneath the disk; the two surfaces remain, therefore, strongly attached by the atmospheric pressure, which acts on their outer sides. An apparatus of this kind, as we shall afterwards find, is met with very frequently among the lower orders of the animal kingdom.



Another kind of circular disposition of fibres is that which occurs in the muscular coats surrounding canals of various kinds, such as the blood vessels and the alimentary tube. Their action tends to contract the diameter of the canal, and to exert pressure on its contents. In these cases, there is generally at the same time provided another layer of fibres, disposed longitudinally, as shown in Fig. 49; the circular fibres being seen in Fig. 50. The action of the longitudinal fibres, is evidently to shorten the canal; while that of the circular fibres, by the yielding of the coats, and the partial reaction of the contents of the vessel, has a tendency to extend it. The *Ascidia*, which is a species of marine worm, is an example of an animal whose skin contains a union of straight and circular fibres, by which all its movements are readily performed. Many instances occur in the cylindrical envelopes of animals, of the combination of a third series of fibres, passing obliquely, with those which have transverse and longitudinal directions. In the muscular skin of the *Leech*, for example, besides two internal layers of longitudinal fibres, an external one has lately been discovered, which is composed of oblique or spiral fibres, crossing one another