

of Oötocoids under Mammals, which has its megasthenic and microsthenic subdivisions; under Worms, etc.

4. *Distinction between Animals and Plants.*

XIII. This subject well illustrates a fundamental distinction between animals and plants.

a. An animal, as has been stated on page 332, has *fore-and-aft*, or antero-posterior, polarity; that is, it has a fore-extremity and a hind-extremity which have that degree of oppositeness that characterizes polarity.

b. With this fore-and-aft polarity there is also *dorso-ventral* polarity.

c. The dorso-ventral and antero-posterior axes are at *right angles* to one another. In Invertebrates and a large part of Vertebrates the antero-posterior axis is horizontal and the dorso-ventral vertical; and only in Man, the prince of Mammals, is the former vertical and the latter horizontal.

d. An animal, again, has not only oppositeness between the fore-extremity and hind-extremity, but also a *head*, the seat of the senses and mouth, situated at the fore-extremity and constituting this extremity.

e. In addition, the typical animal is *forward moving*.

But in animals of the inferior type of *Radiates*, while there is an anterior and a posterior side, and also, in most species, forward motion, the mouth-aperture—which indicates the *primary centre* in an animal (p. 322)—is not placed at one extremity, but is more or less nearly *central*; and almost precisely central in the symmetrical (and therefore inferior) *Radiates*. The mouth-extremity and the opposite are at the *poles of the dorso-ventral axis*, and not at those of the antero-posterior; that is, they are at the extremity of the axis which in the inferior animals is normally *vertical*. This is true even in a *Holothuria*, the mouth of which is not at the *anterior* extremity, but is central, or nearly so, as in an *Echinus*. A *Limulus* has been referred to on page 328 as showing an approximation, under the true animal type, to this same central position of the mouth.

We pass now to *Plants*. The plant, in contrast with the fore-and-aft animal, is an *up-and-down* structure, having up-and-down polarity. The axis is *vertical* like the dorso-ventral in the lower animals, to which it is strictly analogous, as is shown from a comparison with *Radiates*,—*Radiates* and *Plants* being alike in type of structure. The primary centre of force is central, in the same sense, in the regular flower and the symmetrical *Radiate*.

Thus, the structures under the animal-type and plant-type are based on two distinct axial directions, one at right angles to the other: in the *animal-type* the antero-posterior axis being the dominant one, while the two coexist; and in the *plant-type* the axis at right angles to this being the only one.