

the central nervous system of this new species of mammal could possibly consist of a ventral cord with an œsophageal collar as in the insects, or of scattered pairs of knots as in the molluscs, or that its heart could be many-chambered as in flies, or one-chambered as in the tunicates, This completely certain and safe conclusion, although it is not based upon any direct experience, is a *deductive conclusion*. In the same way, as I have shown in a previous chapter, Goethe, from the comparative anatomy of mammals, established the general inductive conclusion that they all possess a mid jawbone, and afterwards drew from it the special deductive conclusion that man, who in all other respects does not essentially differ from other mammals, must also possess a like mid jawbone. He maintained this conclusion without having actually seen the human mid jawbone, and only proved its existence subsequently by actual observation (vol. i. p. 84).

The process of *induction* is a logical system of forming conclusions *from the special to the general*, by which we advance from many individual experiences to a general law; *deduction*, on the other hand, draws a conclusion *from the general to the special*, from a general law of nature to an individual case. Thus the *Theory of Descent* is, without doubt, a great *inductive law*, empirically based upon all the biological experience cited above; the pithecoïd theory, on the other hand, which asserts that man has developed out of lower, and in the first place out of ape-like mammals, is a *deductive law* inseparably connected with the general inductive law.

The pedigree of the human race, the approximate outlines of which I gave in the last chapter but one, of course