along the long rudder-tail, a larval organ, which is cast off in later transformation. Yet there still exist some very small ascidiæ (Appendicularia) which do not become transformed and attached, but which through life swim about freely in the sea by means of their rudder-tail.

The ontogenetic facts which are systematically represented on Plate XII. and which were first discovered in 1867, deserve the greatest attention, and, indeed, cannot be too highly estimated. They fill up the gap which, according to the opinion of older zoologists existed between the vertebrate and the so-called "invertebrate" animals. This gap was universally regarded as so important and so undeniable, that even eminent zoologists, who were not disinclined to adopt the theory of descent, saw in this gap one of the chief obstacles against it. Now that the ontogeny of the amphioxus and the ascidia has set this obstacle completely aside, we are for the first time enabled to trace the pedigree of man beyond the amphioxus into the many-branching tribe of "invertebrate" worms, from which all the other higher animal tribes have originated.

If our speculative philosophers, instead of occupying themselves with castles in the air, were to give their thoughts for some years to the facts represented on Plates XII. and XIII., as well as to those on Plates II. and III., they would gain a foundation for true philosophy—for the knowledge of the universe firmly based on experience—which would be sure to influence all regions of thought. These facts of ontogenesis are the indestructible foundations upon which the monistic philosophy of future times will erect its imperishable system.

PLATE XIV.　(*Between pages 206 and 207, Vol. II.*)

Monophyletic, or One-rooted Pedigree of the Vertebrate Animal tribe, representing the hypothesis of the common derivation of all vertebrate animals, and the historical development of their different classes during the palæontological periods of the earth's history. (Compare Chapter XX. vol. ii. p. 192.) The horizontal