

so have we in like manner, for the purposes of General Homology, to solve the Problem of *the Signification of Limbs*. The whole of the animal being a string of vertebræ, what are arms and legs, hands and paws, claws and fingers, wings and fins, and the like? This inquiry Mr. Owen has pursued as a necessary part of his inquiries. In giving a public lecture upon the subject in 1849,<sup>4</sup> he conceived that the phrase which I have just employed would not be clearly apprehended by an English Audience, and entitled his Discourse "On the *Nature of Limbs*:" and in this discourse he explained the modifications by which the various kinds of limbs are derived from their rudiments in an archetypal skeleton, that is, a mere series of vertebræ without head, arms, legs, wings, or fins.

#### *Final Causes.*

It has been mentioned in the History that in the discussions which took place concerning the Unity of Plan of animal structure, this principle was in some measure put in opposition to the principle of Final Causes: Morphology was opposed to Teleology. It is natural to ask whether the recent study of Morphology has affected this antithesis.

If there be advocates of Final Causes in Physiology who would push their doctrines so far as to assert that every feature and every relation in the structure of animals have a purpose discoverable by man, such reasoners are liable to be perpetually thwarted and embarrassed by the progress of anatomical knowledge; for this progress often shows that an arrangement which had been explained and admired with reference to some purpose, exists also in cases where the purpose disappears; and again, that what had been noted as a special teleological arrangement is the result of a general morphological law. Thus to take an example given by Mr. Owen: that the ossification of the head originates in several centres, and thus in its early stages admits of compression, has been pointed out as a provision to facilitate the birth of viviparous animals; but our view of this provision is disturbed, when we find that the same mode of the formation of the bony framework takes place in animals which are born from an egg. And the number of points from which ossification begins, depends in a wider sense on the general homology of the animal frame, according to which each part is composed of a certain number of autogenous vertebral elements. In this

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<sup>4</sup> *On the Nature of Limbs*, a discourse delivered at a Meeting of the Royal Institution, 1849.