

tensions of collections of strings could do, and an exact practical acquaintance with the muscular cordage which exists in the animal frame ;— in short, in this as in other instances of real advance in science, there must have been clear ideas and real facts, unity of thought and extent of observation, brought into contact.

*Sect. 2.—Recognition of Final Causes in Physiology. Galen.*

THERE is one idea which the researches of the physiologist and the anatomist so constantly force upon him, that he cannot help assuming it as one of the guides of his speculations ; I mean, the idea of a *purpose*, or, as it is called in Aristotelian phrase, a *final cause*, in the arrangements of the animal frame. It is impossible to doubt that the motive nerves run along the limbs, *in order that* they may convey to the muscles the impulses of the will ; and that the muscles are attached to the bones, *in order that* they may move and support them. This conviction prevails so steadily among anatomists, that even when the use of any part is altogether unknown, it is still taken for granted that it has some use. The developement of this conviction,—of a purpose in the parts of animals,—of a function to which each portion of the organization is subservient,—contributed greatly to the progress of physiology ; for it constantly urged men forwards in their researches respecting each organ, till some definite view of its purpose was obtained. The assumption of hypothetical final causes in Physics may have been, as Bacon asserts it to have been, prejudicial to science ; but the assumption of unknown final causes in Physiology, has given rise to the science. The two branches of speculation, Physics and Physiology, were equally led, by every new phenomenon, to ask their question, “Why?” But, in the former case, “why” meant “through what cause?” in the latter, “for what end?” And though it may be possible to introduce into physiology the doctrine of efficient causes, such a step can never obliterate the obligations which the science owes to the pervading conception of a purpose contained in all organization.

This conception makes its appearance very early. Indeed, without any special study of our structure, the thought, that we are fearfully and wonderfully made, forces itself upon men, with a mysterious impressiveness, as a suggestion of our Maker. In this bearing, the thought is developed to a considerable extent in the well-known passage in Xenophon’s *Conversations of Socrates*. Nor did it ever lose its hold on sober-minded and instructed men. The Epicureans, indeed,