

its existing in peculiar conditions, is known as living matter."<sup>1</sup>

Thus, instead of trying to penetrate to the physiological units and construct them through a process of imagination, this latter class of biological thinkers confine themselves to the task of describing in the simplest manner and as completely as possible the various properties of the living substance—*i.e.*, its functions.<sup>2</sup> And

37.  
Properties  
of the living  
substance.

<sup>1</sup> 'Ency. Brit.,' article "Physiology," vol. xix. p. 12. See also an address delivered by Prof. Burdon Sanderson at the meeting of the Brit. Assoc. at Newcastle in 1889 ('Report,' p. 604): "During the last ten or fifteen years histology has carried her methods of research to such a degree of perfection that further improvement scarcely seems possible. As compared with these subtle refinements, the 'minute anatomy' of thirty years ago seems coarse—the skill for which we once took credit seems but clumsiness. Notwithstanding, the problems of the future from their very nature lie as completely out of reach of the one as the other. It is by different methods of investigation that our better-equipped successors must gain insight of those vital processes of which even the ultimate results of microscopical analysis will ever be as they are now, only the outward and visible signs" (p. 608).

<sup>2</sup> As Prof. Burdon Sanderson puts it in his 'Address,' it is a reversion to a position which is not new in the history of physiology. "The departure from the traditions of our science which this change of direction seems to imply is indeed more apparent than real. In tracing the history of some of the greatest advances, we find that the recognition of function has preceded the knowledge of structure. Haller's discovery of irritability was known

and bore fruit long before anything was known of the structure of muscle" (p. 607). ". . . In much more recent times the investigation of the function of gland-cells, which has been carried on with such remarkable results by Prof. Heidenhain in Germany, and with equal success by Mr Langley in this country, has led to the discovery of the structural changes which they undergo in passing from the state of repose to that of activity; nor could I mention a better example than that afforded by Dr Gaskell's recent and very important discovery of the anatomical difference between cerebro-spinal nerves of different functions" (ibid.) What has to a great extent worked this important change in the methods and reasoning in physiology is the recognition of "plurality of function with unity of structure," a principle urged strongly by the experimental school of medicine, with Claude Bernard as its greatest representative. Notably this was the effect of his "demonstration that the liver had other things to do in the animal economy besides secreting bile. This, at one blow, destroyed the then dominant conception that the animal body was to be regarded as a bundle of organs, each with its appropriate function—a conception which did much to narrow inquiry, since when a suitable function had once been assigned to an organ