

at all the levels of analysis, and that at none is there anything approaching completeness.

One of the roots of physiology is in the lore of the old physicians. This was at first, doubtless, either empirical or superstitious, but it began very early to take more rational form. Thus Hippocrates (460-377 B.C.), who was a "priest-physician" at one of the famous Æsculapian hospitals or temples of health, usually gets the credit for trying to place the study of medicine on a scientific, as opposed to a superstitious basis. The other root of physiology is to be found in speculative attempts to formulate some theory of organic life. These attempts oscillated between extremes of materialistic and spiritualistic hypotheses, but it seems hardly possible to speak of an observational basis before the time of Aristotle.

The interest of the Aristotelian physiology is twofold; it represents an attempt to understand the activities of the body in their relations to one another, and it was to some extent based on observation. To one who had seen the *punctum saliens* (the beating heart) in the embryo-chick within the egg-shell, who knew of the parthenogenesis of bees and the quaint discharge of an arm in cuttle-fishes, who discerned that the foetus got its food-supplies from the maternal blood through the umbilical cord, the functions of the body were not likely to be treated of in the easy-going fashion which characterized his predecessors. Yet his mixture of truth and error is extraordinary. Aristotle connected all the functions with the animal heat, which he believed to be associated with the blood and centralized in the beating heart. The blood is recuperated by the food in the gut, is kept fluid by the heart's heat, is carried in the pulsating vessels, and not only nourishes the organs, but gives them mobility and sensitiveness; the urine is derived from the blood flowing in the kidneys; the brain is bloodless and produces mucus; the sense-organs are in the head so that they may not be overheated by the blood; the heart is the seat of the soul and its controlling agencies.

It is generally allowed that Galen (132-200 (?) A.D.)