

THE RIDDLE OF THE UNIVERSE

and a number of other phenomena could be traced to mechanical agencies; respiration and digestion were attributable to chemical processes like those we find in inorganic nature. On the other hand, it seemed impossible to do this with the wonderful performances of the nerves and muscles, and with the characteristic life of the mind; the co-ordination of all the different forces in the life of the individual seemed also beyond such a mechanical interpretation. Hence there arose a complete physiological dualism—an essential distinction was drawn between inorganic and organic nature, between mechanical and vital processes, between material force and life force, between the body and the soul. At the beginning of the nineteenth century this vitalism was firmly established in France by Louis Dumas, and in Germany by Reil. Alexander Humboldt had already published a poetical presentation of it in 1795, in his narrative of the *Legend of Rhodes*; it is repeated, with critical notes, in his *Views of Nature*.

In the first half of the seventeenth century the famous philosopher Descartes, starting from Harvey's discovery of the circulation of the blood, put forward the idea that the body of man, like that of other animals, is merely an intricate machine, and that its movements take place under the same mechanical laws as the movements of an automaton of human construction. It is true that Descartes, at the same time, claimed for man the exclusive possession of a perfectly independent, immaterial soul, and held that its subjective experience, thought, was the only thing in the world of which we have direct and certain cognizance ("*Cogito, ergo sum*"). Yet this dualism did not prevent him from doing much to advance our knowledge of the mechanical life processes in detail. Borelli followed (1660)