

Schwann defined the cell as "a small vesicle with a firm membrane enclosing fluid content."¹ But the cellular theory was gradually replaced by the protoplasmic theory of Max Schultze, the distinct membrane was found to be frequently absent, and there only remained "a small mass of protoplasm endowed with the attributes of life." The cell, which had once been compared to a crystal, became a very complicated and indefinite thing: it became, in the conception of biologists, an "organism."² Further, the nucleus or kernel to which Schleiden attached great importance in his cellular theory was, for a while, quite lost sight of—it being for a long time held that there exist non-nucleated cells. Elaborate theories, such as that of Haeckel,³ were founded upon this view, till in more

¹ O. Hertwig, 'The Cell,' p. 5 n.

² Treatises on the subject now usually begin with an apology, the word cell being considered misleading. Thus Hertwig says (*loc. cit.*, p. 8), "It is evident that the term 'cell' is incorrect. That it has, nevertheless, been retained may be partly ascribed to a kind of loyalty to the vigorous combatants who conquered the whole field of histology under the banner of the cell-theory, and partly to the circumstance that the discoveries which brought about the new reform were only made by degrees, and were not generally accepted at a time when, in consequence of its having been used for several decades, the word cell had taken firm root in the literature of the subject."

³ "Since, in consequence of the inadequacy of former methods, no nuclei had been discovered in many of the lower organisms, the existence of two kinds of elementary

cells was assumed—more simple ones, consisting only of a mass of protoplasm, and more complex ones, which had developed in their interior a special organ, the nucleus. The former were called cytodes by Haeckel (1866), to the simplest solitary forms of which he gave the name of Monera; the latter he called cellule, or cytes. But since then the aspect of the question has been considerably changed. Thanks to the improvements in optical instruments and in staining methods, the existence of organisms without nuclei is now much questioned." (Hertwig, 'The Cell,' p. 54. See also Haecker, p. 239.) On the other side M. Delage says ('L'Hérédité,' p. 37), 'Après avoir découvert un noyau chez la plupart des monères et des cytodes et même chez les Bactéries, on a, par une induction à mon sens un peu hâtive, nié l'existence d'organismes sans noyau.'