

44.  
The proto-  
plasmic  
theory.

and the year 1863 is usually given as that in which the protoplasmic theory was established. According to this view protoplasm is the element or unit of all living substance: it grows through assimilation (intussusception and excretion), and multiplies (*i.e.*, gives rise to other living units) by subsequent division. This process was found to be fundamental: it describes the growth of the simplest and the most complicated organisms as beginning alike with a unit cell, which may or may not grow by division; it is the formula of growth, restitution, and generation (whether sexual or asexual); and, what is equally important, it prevails also in pathological cases—*i.e.*, in the formation of diseased tissues. In fact, the great generalisation which followed Harvey's celebrated dictum, "*omne vivum ex ovo*," was put forth by the late Professor Rudolf Virchow, the eminent founder of cellular pathology, in his formula, "*omnis cellula e cellula*." The formula has in more recent times been further elaborated on the same lines of thought in proportion as the importance of the nucleus or cell kernel has been recognised, or as the granular structure of protoplasm has been maintained; leading to analogous formulæ, such as "*omnis nucleus e nucleo*," "*omne granulum e granulo*." These formulæ<sup>1</sup> are the

<sup>1</sup> See Roux ('*Gesammelte Abhandlungen*,' vol. i. p. 393): "Uninterrupted durability is the indispensable condition of all that is organic, although this does not involve a distinction from inorganic processes. This fact is expressed by the fundamental theses: *Omne vivum ex ovo* (Harvey), *Omnis cellula e cellula* (Virchow), *Omnis nucleus e nucleo* (Flemming)."

Hauptmann ('*Die Metaphysik*,' &c., p. 334) says: "Altmann formulates for himself in analogy with these biological principles the further principle, '*Omne granulum e granulo*.'" On Altmann's theory of the "bioblasts" as elementary organisms, see Yves Delage, '*L'Hérédité*,' p. 498, &c., Hertwig, '*The Cell*,' p. 24.