

13.
Epigenesis
and evolu-
tion.

generalisation which he ventured to put forward, that growth and development of the germ or embryo consisted in the addition or formation of new parts and structures through division or differentiation, was, however, obscured and cast into the shade by the opposite doctrine, termed evolution, according to which every form or particle of organisation was minutely pre-formed in an invisible germ, and growth consisted merely in a process of enlargement, as a particle of "dry gelatine may be swelled up by the intussusception of water." The supporters of this doctrine, to which the celebrated names of Leibniz, Boerhaave, Haller, and Bonnet belonged, seemed unable to conceive of any force in nature which was capable of producing organisation, and were thus compelled to accept in some form or other the doctrine of the pre-existence of germs, a theory which has in modern times been revived under an altered form.

14.
C. F. Wolff.

The real foundation of scientific embryology, of the study of the genesis of vegetable and animal organisms, is now pretty unanimously¹ traced to Caspar Friedrich Wolff, whose 'Theoria generationis' appeared in 1759. His observations refer alike to plant and to animal life, and his distinct object was to refute the theory of evolu-

ment is carried still further, and the origin of the molecular components of the physically gross, though sensibly minute, bodies which we term germs is traced, the theory of development will approach more nearly to metamorphosis than to epigenesis. . . . The process, which in its superficial aspect is epigenesis, appears in essence to be evolution in the modified sense adopted in Bonnet's

later writings; and development is merely the expansion of a potential organism or original pre-formation according to fixed laws."

¹ See J. A. Thomson, *loc. cit.*, p. 121. Yves Delage, 'L'Hérédité,' p. 357, note; and especially O. Hertwig, 'The Biological Problem of To-day,' transl. by P. C. Mitchell (Heinemann's Scientific Handbooks, 1896), p. 4, &c.