

## SECTION XX.

## ALTERNATE GENERATIONS.

While some animals go on developing gradually from the first formation of their germ to the natural end of their life, and bring forth generation after generation, a progeny which runs with never varying regularity through the same course, there are others which multiply in various ways, by division and by budding,<sup>1</sup> or by a strange succession of generations, differing one from the other, and not returning, by a direct course, to their typical cycle.

The facts which have led to the knowledge of the phenomena now generally known under the name of *alternate generation*, were first observed by Chamisso and Sars, and afterwards presented in a methodical connection by Steenstrup, in his famous pamphlet on that subject.<sup>2</sup> As a brief account of the facts may be found in almost every text-book of Physiology, I need not repeat them here, but only refer to the original investigations, in which all the details known upon this subject may be found.<sup>3</sup> These facts show, in the first place with regard to Hydroid Medusæ, that the individuals born from eggs, may be entirely different from those which produced the eggs, and end their life without ever undergoing themselves such changes as would transform them into individuals similar to their parents;<sup>4</sup> they show further,

<sup>1</sup> Much information useful to the zoölogist, may be gathered from BRACH'S paper upon the Budding of Plants, q. n., p. 18, note 3. The process of multiplication by budding or by division, and that of sexual reproduction, are too often confounded by zoölogists, and this confusion has already led to serious misconstructions of well known facts.

<sup>2</sup> STEENSTRUP, (J.) Ueber den Generationswechsel, q. n., p. 69, note 3.

<sup>3</sup> See the works quoted above, page 69, note 3, and p. 70, note 1, also CARUS, (V.) Zur nähern Kenntniss des Generationswechsels, Leipzig, 1849, 8vo. — Einige Worte über Metamorphose und Generationswechsel, Zeitsch. f. wiss. Zool., 1851, vol. 3, p. 359. — OWEN, (R.) On Parthenogenesis, or the Successive Production of Procreating Individuals from a single Ovum, London, 1849, 8vo. — On Metamorphosis and Metagenesis, Ann. and Mag. Nat. Hist.,

2d ser. vol. 8, 1857, p. 59. — PROSCH, (V.) Om Parthenogenesis og Generationswechsel et Bidrag til Generationsheren, Kiöbenhavn, 1851. — LEUCKART, (R.) Ueber Metamorphose, ungeschlechtliche Vermehrung, Generationswechsel, Zeitsch. f. wiss. Zool., vol. 3, 1851. — DANA, (J. D.) On the Analogy between the Mode of Reproduction in Plants and the "Alternation of Generations" observed in some Radiata, Amer. Journ. A. and Sc., 2d ser. vol. 10, p. 341. — EHRENBERG, (C. G.) Ueber die Formenbeständigkeit und den Entwicklungskreis der organischen Formen, Monatsber. der Akad., Berlin, 1852, 8vo.

<sup>4</sup> Polymorphism among individuals of the same species is not limited to Aculephs; it is also observed among genuine Polyps, the Madreporæ, for example, and among Bryozoa, Ascidians, Worms, Crustacea (Lupen), and even among Insects (Bees).