

plants, and can combine with that of another and distinct plant, giving rise to a new being, intermediate in character. We know also that the male element can act directly on the partially developed tissues of the mother-plant, and on the future progeny of female animals. The formative matter which is thus dispersed throughout the tissues of plants, and which is capable of being developed into each unit or part, must be generated there by some means; and my chief assumption is that this matter consists of minute particles or gemmules cast off from each unit or cell.⁴³

But I have further to assume that the gemmules in their undeveloped state are capable of largely multiplying themselves by self-division, like independent organisms. Delpino insists that to "admit of multiplication by fission in corpuscles, "analogous to seeds or buds . . . is repugnant to all analogy." But this seems a strange objection, as Thuret⁴⁴ has seen the zoospore of an alga divide itself, and each half germinated. Haeckel divided the segmented ovum of a siphonophora into many pieces, and these were developed. Nor does the extreme minuteness of the gemmules, which can hardly differ much in nature from the lowest and simplest organisms, render it improbable that they should grow and multiply. A great authority, Dr. Beale,⁴⁵ says "that minute yeast cells are "capable of throwing off buds or gemmules, much less than "the $\frac{1}{100000}$ of an inch in diameter;" and these he thinks are "capable of subdivision practically ad infinitum."

A particle of small-pox matter, so minute as to be borne by the wind, must multiply itself many thousandfold in a person thus inoculated; and so with the contagious matter of scarlet fever.⁴⁶ It has recently been ascertained⁴⁷ that a minute portion of the mucous discharge from an animal affected with

⁴³ Mr. Lowne has observed ('Journal of Queckett Microscopical Club,' Sept. 23, 1870) certain remarkable changes in the tissues of the larva of a fly, which makes him believe "it possible that organs and organisms are sometimes developed by the aggregation of excessively minute gemmules, such as those which Mr. Darwin's hypothesis demands."

⁴⁴ 'Annales des Sc. Nat.,' 3rd series, Bot., tom. xiv., 1850, p. 244.

⁴⁵ 'Disease Germs,' p. 20.

⁴⁶ See some very interesting papers on this subject by Dr. Beale, in 'Medical Times and Gazette,' Sept. 9th, 1865, pp. 273, 330.

⁴⁷ Third Report of the R. Comm. on the Cattle Plague, as quoted in 'Gard. Chronicle,' 1866, p. 446.