

half or one-quarter a nectarine, and the other half or three-quarters a peach. Again, seven or eight varieties of the peach have yielded by bud-variation nectarines: the nectarines thus produced, no doubt, differ a little from one another; but still they are nectarines. Of course there must be some cause, internal or external, to excite the peach-bud to change its nature; but I cannot imagine a class of facts better adapted to force on our minds the conviction that what we call the external conditions of life are in many cases quite insignificant in relation to any particular variation, in comparison with the organisation or constitution of the being which varies.

It is known from the labours of Geoffroy Saint-Hilaire, and recently from those of Dareste and others, that eggs of the fowl, if shaken, placed upright, perforated, covered in part with varnish, &c., produce monstrous chickens. Now these monstrosities may be said to be directly caused by such unnatural conditions, but the modifications thus induced are not of a definite nature. An excellent observer, M. Camille Dareste,⁵⁹ remarks "that the various species of monstrosities are not determined by specific causes; the external agencies which modify the development of the embryo act solely in causing a perturbation—a perversion in the normal course of development." He compares the result to what we see in illness: a sudden chill, for instance, affects one individual alone out of many, causing either a cold, or sore-throat, rheumatism, or inflammation of the lungs or pleura. Contagious matter acts in an analogous manner.⁶⁰ We may take a still more specific instance: seven pigeons were struck by rattlesnakes:⁶¹ some suffered from convulsions; some had their blood coagulated, in others it was perfectly fluid; some showed ecchymosed spots on the heart, others on the intestines, &c.; others again showed no visible lesion in any organ. It is well known that excess in drinking causes different diseases

⁵⁹ 'Mémoire sur la Production Artificielle des Monstrosités,' 1852, pp. 8-12; 'Recherches sur les Conditions, &c., chez les Monstres,' 1863, p. 6. An abstract is given of Geoffroy's Experiments by his son, in

his 'Vie, Travaux,' &c., 1847, p. 290.

⁶⁰ Paget, 'Lectures on Surgical Pathology,' 1853, vol. i. p. 483.

⁶¹ 'Researches upon the Venom of the Rattle-snake,' Jan. 1861, by Dr. Mitchell, p. 67.