

On the Nature of the Changes in the Conditions of Life which induce Variability.

From a remote period to the present day, under climates and circumstances as different as it is possible to conceive, organic beings of all kinds, when domesticated or cultivated, have varied. We see this with the many domestic races of quadrupeds and birds belonging to different orders, with gold-fish and silkworms, with plants of many kinds, raised in various quarters of the world. In the deserts of northern Africa the date-palm has yielded thirty-eight varieties; in the fertile plains of India it is notorious how many varieties of rice and of a host of other plants exist; in a single Polynesian island, twenty-four varieties of the bread-fruit, the same number of the banana, and twenty-two varieties of the arum, are cultivated by the natives; the mulberry-tree in India and Europe has yielded many varieties serving as food for the silkworm; and in China sixty-three varieties of the bamboo are used for various domestic purposes.⁵ These facts, and innumerable others which could be added, indicate that a change of almost any kind in the conditions of life suffices to cause variability—different changes acting on different organisms.

Andrew Knight⁶ attributed the variation of both animals and plants to a more abundant supply of nourishment, or to a more favourable climate, than that natural to the species. A more genial climate, however, is far from necessary; the kidney-bean, which is often injured by our spring frosts, and peaches, which require the protection of a wall, have varied much in England, as has the orange-tree in northern Italy, where it is barely able to exist.⁷ Nor can we overlook the

⁵ On the date-palm, see Vogel, 'Annals and Mag. of Nat. Hist.,' 1854, p. 460. On Indian varieties, Dr. F. Hamilton, 'Transact. Linn. Soc.,' vol. xiv. p. 296. On the varieties cultivated in Tahiti, see Dr. Bennett, in Loudon's 'Mag. of N. Hist.,' vol. v., 1832, p. 484. Also Ellis, 'Polynesian Researches,' vol. i. pp. 370, 375. On twenty varieties

of the Pandanus and other trees in the Marianne Island, see 'Hooker's Miscellany,' vol. i. p. 308. On the bamboo in China, see Huc's 'Chinese Empire,' vol. ii. p. 307.

⁶ 'Treatise on the Culture of the Apple,' &c., p. 3.

⁷ Gallesio, 'Teoria della Riproduzione Veg.,' p. 125.