

known to be constant in Spain, which in Germany assumed their proper character only during hot summers; another variety kept true only in good land, but after having been cultivated for twenty-five years became more constant. He mentions two other sub-varieties which were at first inconstant, but subsequently became, apparently without any selection, accustomed to their new homes, and retained their proper character. These facts show what small changes in the conditions of life cause variability, and they further show that a variety may become habituated to new conditions. One is at first inclined to conclude with Loiseleur-Deslongchamps, that wheat cultivated in the same country is exposed to remarkably uniform conditions; but manures differ; seed is taken from one soil to another, and, what is far more important, the plants are exposed as little as possible to struggle with other plants, and are thus enabled to exist under diversified conditions. In a state of nature each plant is confined to that particular station and kind of nutriment which it can seize from the other plants by which it is surrounded.

Wheat quickly assumes new habits of life. The summer and winter kinds were classed by Linnæus as distinct species; but M. Monnier³⁷ has proved that the difference between them is only temporary. He sowed winter-wheat in spring, and out of one hundred plants four alone produced ripe seeds; these were sown and resown, and in three years plants were reared which ripened all their seed. Conversely, nearly all the plants raised from summer-wheat, which was sown in autumn, perished from frost; but a few were saved and produced seed, and in three years this summer-variety was converted into a winter-variety. Hence it is not surprising that wheat soon becomes to a certain extent acclimatised, and that seed brought from distant countries and sown in Europe vegetates at first, or even for a considerable period,³⁸ differently from our European varieties. In Canada the first settlers, according to Kalm,³⁹ found their winters too severe for winter-wheat brought from France, and their summers often too short for summer-wheat; and they thought that their country was useless for corn crops until they procured summer-wheat from the northern parts of Europe, which succeeded well. It is notorious that the proportion of gluten differs much under different climates. The weight of the grain is also quickly affected by climate: Loiseleur-Deslongchamps⁴⁰ sowed near Paris 54 varieties, obtained from the South of France and from the Black Sea, and 52 of these yielded seed from 10 to 40 per cent. heavier than the parent-seed. He then

³⁷ Quoted by Godron, 'De l'Espèce,' vol. ii. p. 74. So it is, according to Metzger ('Getreidearten,' s. 18), with summer and winter barley.

³⁸ Loiseleur-Deslongchamps, 'Céréales,' part ii. p. 224. Le Couteur, p.

70. Many other accounts could be added.

³⁹ 'Travels in North America,' 1753-1761, Eng. transl., vol. iii. p. 165.

⁴⁰ 'Céréales,' part ii. pp. 179-183