

fact, though not immediately connected with our present subject, that the plants and shells of the Arctic regions are eminently variable.<sup>8</sup> Moreover, it does not appear that a change of climate, whether more or less genial, is one of the most potent causes of variability; for in regard to plants Alph. De Candolle, in his 'Géographie Botanique,' repeatedly shows that the native country of a plant, where in most cases it has been longest cultivated, is that where it has yielded the greatest number of varieties.

It is doubtful whether a change in the nature of the food is a potent cause of variability. Scarcely any domesticated animal has varied more than the pigeon or the fowl, but their food, especially that of highly-bred pigeons, is generally the same. Nor can our cattle and sheep have been subjected to any great change in this respect. But in all these cases the food probably is much less varied in kind than that which was consumed by the species in its natural state.<sup>9</sup>

Of all the causes which induce variability, excess of food, whether or not changed in nature, is probably the most powerful. This view was held with regard to plants by Andrew Knight, and is now held by Schleiden, more especially in reference to the inorganic elements of the food.<sup>10</sup> In order to give a plant more food it suffices in most cases to grow it separately, and thus prevent other plants robbing its roots. It is surprising, as I have often seen, how vigorously our common wild species flourish when planted by themselves, though not in highly manured land; separate growth is, in fact, the first step in cultivation. We see the converse of the belief that excess of food induces variability in the following statement by a great raiser of seeds of all kinds:<sup>11</sup>

<sup>8</sup> See Dr. Hooker's Memoir on Arctic Plants in 'Linn. Transact.,' vol. xxiii. part ii. Mr. Woodward, and a higher authority cannot be quoted, speaks of the Arctic mollusca (in his 'Rudimentary Treatise,' 1856, p. 355) as remarkably subject to variation.

<sup>9</sup> Bechstein, in his 'Naturgeschichte der Stubenvögel,' 1840, s. 238, has some good remarks on this

subject. He states that his canary-birds varied in colour, though kept on uniform food.

<sup>10</sup> 'The Plant,' by Schleiden, translated by Henfrey, 1848, p. 169. See also Alex. Braun, in 'Bot. Memoirs,' Ray Soc., 1853, p. 313.

<sup>11</sup> Messrs. Hardy and Son, of Maldon, in 'Gard. Chronicle,' 1856, p. 458. Carrière, 'Production et Fixation des Variétés,' 1865, p. 31.