their having practised artificial irrigation and made tunnels through hard rocks without the use of iron or gunpowder, and who, as we shall see in a future chapter, fully recognised, as far as animals were concerned, and therefore probably in the case of plants, the important principle of selection. We owe some plants to Brazil; and the early voyagers, namely, Vespucius and Cabral, describe the country as thickly peopled and cultivated. In North America[16] the natives cultivated maize, pumpkins, gourds, beans, and peas, "all different from ours," and tobacco; and we are hardly justified in assuming that none of our present plants are descended from these North American forms. Had North America been civilized for as long a period, and as thickly peopled, as Asia or Europe, it is probable that the native vines, walnuts, mulberries, crabs, and plums, would have given rise, after a long course of cultivation, to a multitude of varieties, some extremely different from their parent-stocks; and escaped seedlings would have caused in the New, as in the Old World, much perplexity with respect to their specific distinctness and parentage.[17]

Cerealia.—I will now enter on details. The cereals cultivated in Europe consist of four genera—wheat, rye, barley, and oats. Of wheat the best modern authorities[18] make four or five, or even seven distinct species; of rye, one; of barley, three; and of oats, two, three, or four species. So that altogether our cereals are ranked by different authors under from ten to fifteen distinct species. These have given rise to a multitude of varieties. It is a remarkable fact that botanists are not universally agreed on the aboriginal parent-form of any one cereal plant. For instance, a

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[16] For Canada, *see* J. Cartier's Voyage in 1534; for Florida, *see* Narvaez and Ferdinand de Soto's Voyages. As I have consulted these and other old Voyages in more than one general collection of Voyages, I do not give precise references to the pages. *See* also, for several references, Asa Gray, in the 'American Journal of Science,' vol. xxiv. Nov. 1857, p. 441. For the traditions of the natives of New Zealand, *see* Crawfurd's 'Grammar and Dict. of the Malay Language,' 1852, p. cclx.

[17] *See*, for example, Mr. Hewett C. Watson's remarks on our wild plums and cherries and crabs: 'Cybele Britannica,' vol. i. pp. 330, 334, &c. Van Mons (in his 'Arbres Fruitiers,' 1835, tom. i. p. 444) declares that he has found the types of all our cultivated varieties in wild seedlings, but then he looks on these seedlings as so many aboriginal stocks.

[18] *See* A. De Candolle, 'Géograph. Bot.,' 1855, p. 928 *et seq.* Godron, 'De l'Espèce,' 1859, tom. ii. p. 70; and Metzger, 'Die Getreidearten,' &c., 1841.