

and De Candolle to only four. It is not improbable that, besides the kinds known in Europe, other strongly characterised forms exist in the more distant parts of the world; for Loiseleur-Deslongchamps<sup>24</sup> speaks of three new species or varieties, sent to Europe in 1822 from Chinese Mongolia, which he considers as being there indigenous. Moorcroft<sup>25</sup> also speaks of Hasora wheat in Ladakh as very peculiar. If those botanists are right who believe that at least seven species of wheat originally existed, then the amount of variation in any important character which wheat has undergone under cultivation has been slight; but if only four or a lesser number of species originally existed, then it is evident that varieties have arisen so strongly marked, that they have been considered by capable judges as specifically distinct. But the impossibility of deciding which forms ought to be ranked as species and which as varieties, makes it useless to specify in detail the differences between the various kinds of wheat. Speaking generally, the organs of vegetation differ little;<sup>26</sup> but some kinds grow close and upright, whilst others spread and trail along the ground. The straw differs in being more or less hollow, and in quality. The ears<sup>27</sup> differ in colour and in shape, being quadrangular, compressed, or nearly cylindrical; and the florets differ in their approximation to each other, in their pubescence, and in being more or less elongated. The presence or absence of barbs is a conspicuous difference, and in certain Gramineæ serves even as a generic character;<sup>28</sup> although, as remarked by Godron,<sup>29</sup> the presence of barbs is variable in certain wild grasses, and especially in those such as *Bromus secalinus* and *Lolium temulentum*, which habitually grow mingled with our cereal crops, and which have thus unintentionally been exposed to culture. The grains differ in size, weight, and colour; in being more or less downy at one end, in being smooth or wrinkled, in being either nearly globular, oval, or elongated; and finally in internal texture, being tender or hard, or even almost horny, and in the proportion of gluten which they contain.

Nearly all the races or species of wheat vary, as Godron<sup>30</sup> has remarked, in an exactly parallel manner,—in the seed being downy or glabrous, and in colour,—and in the florets being barbed or not barbed, &c. Those who believe that all the kinds are descended from a single wild species may account for this parallel variation by the inheritance of a similar constitution, and a consequent tendency to vary in the same manner; and those who believe in the general theory of descent with modification may extend this

<sup>24</sup> 'Considérations sur les Céréales,' 1842-43, p. 29.

<sup>25</sup> 'Travels in the Himalayan Provinces,' &c., 1841, vol. i. p. 224.

<sup>26</sup> Col. J. Le Couteur on the 'Varieties of Wheat,' pp. 23, 79.

<sup>27</sup> Loiseleur-Deslongchamps, 'Con-

sid. sur les Céréales,' p. 11.

<sup>28</sup> See an excellent review in Hooker's 'Journ. of Botany,' vol. viii. p. 82, note.

<sup>29</sup> 'De l'Espèce, tom. ii. p. 73.

<sup>30</sup> Ibid., tom. ii. p. 75.