

part des épillets ne présentent que deux longues arêtes, au lieu de quatre, dans les épillets inférieurs. La valve membraneuse extérieure de la balle, au lieu d'être terminée par trois arêtes, n'en offre qu'une, à la base de laquelle on voit deux rudiments de celles qui manquent. L'autre valve membranée est sans barbe et ciliée à son sommet. Les épis sont formés, comme ceux de l'*Aegilops ovata*, de trois à quatre épillets le plus souvent stériles, rarement fertiles. Les fleurs sont hermaphrodites et renferment trois étamines autour d'un pistil terminé par deux longs stigmates soyeux. Ces fleurs sont souvent stériles par l'avortement du pistil. Les fruits (grains) de celles qui sont fertiles, sont allongés anguleux, fortement concaves et quelquefois aplatis d'un côté; leur couleur est jaune, tombant sur le noir, comme ceux de l'*Aegilops ovata*, mais ils sont beaucoup plus longs et soyeux à leur sommet. Ces fruits, semés et cultivés pour la première fois, ont donné des plantes deux ou trois fois plus hautes; des épis cylindriques beaucoup plus allongés que ceux de la plante-mère, dans lesquels les valves de la glume n'avaient que deux arêtes dont une plus courte que l'autre, quelquefois même cette dernière manquait presque complètement, de sorte qu'il n'en restait qu'une à chaque valve, comme dans les froments; de plus, comme dans les *Triticum*, les arêtes des glumes de certains individus étaient fort longues, pendant que d'autres les avaient courtes. Ces plantes avaient toutes d'ailleurs le port des *Triticum* dont elles prenaient de plus en plus le caractère. Les épillets, plus nombreux que ceux de la plante-mère, étaient souvent stériles, et ceux, en petit nombre, qui ne l'étaient pas, n'avaient qu'une ou deux fleurs fertiles, de sorte que les épillets fertiles ne donnaient qu'un ou deux grains; ces grains semés donnèrent, l'année suivante, des plantes plus perfectionnées. Leurs épillets étaient plus nombreux que ceux de l'année précédente, et presque tous renfermaient deux fleurs fertiles et donnaient conséquemment deux fruits (grains). Les arêtes de la glume étaient toujours au nombre de deux, mais l'avortement de l'une était plus grand que dans les épis de l'année précédente, et souvent il était complet. Les fruits (grains) étaient moins serrés, moins concaves et moins velus à leur extrémité. Les épis, à leur maturité, se détachaient moins aisément de l'axe et les grains contenaient beaucoup plus de farine que leurs devanciers. Un troisième semis a donné des plantes semblables à celles de l'année précédente, mais qui s'en distinguent par des épis plus perfectionnés. Ceux-ci n'ont presque plus d'épillets stériles; les épillets donnent chacun deux et quelquefois trois fruits (grains) plus développés, moins concaves et moins velus. L'année suivante, quatrième année, point de changement remarquable. Un an plus tard, les tiges arquirent jusqu'à 1 mètre de hauteur; les fruits (grains) étaient assez développés pour écarter les valves de la balle et se montrer à découvert à l'époque de la maturité. Les épis mûrs se détachent moins facilement des tiges qui les portent. Un an plus tard, tous les épillets étaient fertiles, quoique les épis se cassassent facilement. L'année suivante, les épis ne se cassaient pas aisément, tous les épillets étaient fertiles, renfer-

mant quelquefois trois grains bien développés. Il est évident que nous avions alors un vrai *Triticum*, un vrai blé, puisque, cultivé en plein champ pendant quatre années consécutives, il a conservé sa forme et donné des récoltes semblables à celles des autres blés du pays.

Conclusions de l'Auteur de l'Introduction. (F. Duval.)

Les observations précédentes montrent que l'*Ae. ovata*, L., dans certaines circonstances, se modifie beaucoup. Pendant que les enveloppes florales perdent leur ampleur, une partie de leurs arêtes et deviennent ainsi semblables à celles des *Triticum*; leurs tiges, leurs feuilles et leurs épis se développent beaucoup et achèvent de leur donner tous les caractères des froments. L'on est ainsi forcé d'admettre que certains *Triticum* cultivés, si ce n'est tous, ne sont que des formes particulières de certains *Aegilops* et doivent être considérés comme des races de ces espèces.

Ce fait admis, nous pouvons aisément nous rendre compte de tout ce qui a été avancé sur l'origine du blé.

On a dit dans les temps anciens, comme dans les temps modernes, que le blé était sauvage en Babylonie, en Perse, en Sicile. Mais, dans toutes ces localités de la région méditerranéenne, les *Aegilops* croissent en abondance; il n'est pas surprenant que plusieurs espèces de ce genre y aient acquis accidentellement le développement qui en a fait des *Triticum*, lesquels ont ensuite été améliorés et propagés par la culture. Ainsi, à M. Esprit Fabre est dû l'honneur d'avoir démontré la véritable origine du blé cultivé. A la vérité, elle avait été pressentie et vaguement indiquée par diverses personnes; mais, comme l'a dit, je crois, M. Mirbel, l'honneur d'une découverte appartient beaucoup moins à ceux qui l'ont pressentie qu'à celui qui l'a démontrée par des observations, des expériences ou des arguments sans réplique.

Transformation of *Aegilops* in *Triticum*.

I.

(Gardeners' Chronicle, 17. Juli 1832.)

In 1844 the question of the Transmutation of Corn was raised in this Journal, at p. 555 of the volume for that year and at p. 779 it was further alluded to. There upon ensued many communications on both sides the question, and from time to time the subject has been revived; but it must be owned that it nevertheless remains just where it was, so far as anything like proof is concerned. Belief has opposed itself to unbelief, credulity to incredulity; and assertion to counterassertion; but of evidence derived from well conducted experiments we have had nothing. For ourselves, without by any means encouraging the belief in the change of Oats into Rye, or in any similar transmutations, we have also asserted, from the first, that no naturalist acquainted with certain facts which have become known of late years could venture absolutely to deny the possibility of such changes. Writing in 1844 we said that »in Orchidaceous plants forms just as different as Wheat, Barley, Rye, and Oats, have been proved by the most rigorous evi-

dence to be accidental variations of one common form, brought about no one knows how, but before our eyes, and rendered permanent by equally mysterious agency." "Then," says Reason, "if these inconceivable changes have been proved to occur among Orchidaceae why should they not also occur among corn-plants? for it is not likely that such vagaries will be confined to one little group in the vegetable kingdom; it is far more rational to believe them to be a part of the general system of the creation." (1844 p. 555.) And again, in reply to a correspondent, it was added, "as we have repeatedly stated, we think that no man should undertake to affirm *ex cathedra* what is possible or impossible in nature." (1845 p. 410.)

Some have thought these views objectionable, believing that we already possess that amount of knowledge of natural phenomena which justifies our deciding dogmatically upon such general questions as the change of one plant into another. It has been even held that scepticism in such matters tends to unsettle men's minds, and to induce disbelief in all by which science holds fast. We do not concur in that opinion; we see no harm in reviving even Lord Monboddo's belief in human tails; the more knowledge advances the more easily false theory and idle hypothesis are disposed of; rational discussion can do no harm among men of intelligence, on the contrary, it is thus only that truth is to finally elicited.

A most curious and able dissertation upon the Origin of Wheat, which we have just read, completely justifies the views we have held, for although it does not show that Oats change into Rye, as many believe, and offers no support to some other speculations of the same kind, nevertheless demonstrates, beyond all further question, that Wheat is itself a transmutation of a species of wild Grass.

Mons. Esprit Fabre, of Agde, well known to botanists as an acute observer and patient experimentalist, has made the discovery, which has been introduced to public notice by Professor Dunal of Montpellier, in a pamphlet, from which we condense the following statement.

The ancients imagined that the native country of Wheat was the valley of Enna Sicily, where it is said that the fables of Ceres and Triptolemus originated. In fact there grows in Sicily, in great abundance, a wild Grass, called by botanists *Aegilops ovata*, the grain of which is much like that of starved Wheat, but whose floral organs are of a very different character, and whose ears naturally fall to pieces by a separation of the joints when ripe. This kind of grain is said to have borne the name of *Blé du diable*; the plant which produced it was even called by *Caesalpinus Triticum sylvestre*. Nevertheless naturalists appear, with one accord, to have treated the notion of Wheat coming from *Aegilops ovata* as an absurdity, with the exception of two French observers, whose experiments arrived at no known result.

About the year 1824 the late Mr. Requien, a zealous French botanist, residing at Avignon, observed in the neighbourhood of that city a, to him, new species of *Aegilops*, which he called *triticoïdes*, because of its

resemblance to Wheat; and Signor Bertoloni, who introduced it into his Italian Flora, states that it has also been found in Sicily by Professors Gussone and Tenore. There is also in the South of France another *Aegilops* called *triaristata*, supposed to be a different species. Thus according to botanists, there are three different species of this genus in the South of Europe, and these have been each the subject of M. Esprit Fabre's experiments.

The first point established by this observer was that both *Aegilops ovata* and *triaristata* would produce what Requien called *Ae. triticoïdes*. It would therefore seem that the three supposed species were all forms of the same species. In fact, the very same ear which yields either *Ae. ovata* or *Ae. triaristata* also yields *Ae. triticoïdes*. Nevertheless, M. Fabre calls them perfectly distinct from each other, and is of opinion that when *Ae. ovata* runs to *Ae. triticoïdes*, it gives rise to the small grained smooth Wheats which the French call *Seissette* and *Touzelle*; while, on the other hand, when *Ae. triaristata* runs into *Ae. triticoïdes*, it gives birth to the coarser Wheats with downy ears, known in Lower Languedoc under the name *Fourmen* and *Petaniellé*, among which Egyptian Wheat is included. Be that as it may, and M. Fabre offers the statement merely as an hypothesis, it is certain that *Aegilops triticoïdes*, when once produced, if raised from seed year after year, goes on changing till at last it becomes mere Wheat. This is clearly shown by the following concise narrative of which the French naturalist testifies to having witnessed as occurring to the *Ae. triticoïdes* derived from *Ae. ovata*.

First year of cultivation; 1839. A few grains ripening here and there among the spiklets, which still preserved the brittle character of *Aegilops*. The return was about five fold of closepacked concave corn, which was very velvety at the upper end. The beards of the glumes, which are most abundant and remarkable in *Aegilops*, had begun to alter and disappear. The plants looked exactly like *Touzelle* Wheat.

Second year; 1841. The spiklets of this sowing had become more numerous, and each contained two grains; the ears were less brittle; the grain was less concave and velvety, and much more floury than in the previous year. The beards of the glumes were further diminished.

Third sowing; 1841. The changes already described became more evident; as many as three grains appeared in some spiklets; the plants became more and more like Wheat.

Fourth sowing; crop of 1842. Much injured by rust; the beards had so much disappeared that the ears had quite the appearance of beardless *Touzelle* Wheat.

Fifth sowing; 1843. The plants were now a yard high and exactly like Wheat; none of the glumes had more than one beard, with, perhaps, the rudiments of another. The spiklets contained each from two to three grains. The ears had become less brittle. The corn was so large that it protruded beyond the chaf; the crop was 180-fold in one case and 450-fold in another

Sixth sowing; 1844. Changes still went on, but slowly. The ears continued brittle; one of the great peculiarities of *Aegilops*.

Seventh sowing; 1845. The plants were very much like Wheat. Beards were further diminished. Each spiklet contained from four to five flowers, of which three were fertile, as in good Wheat. These were really Wheat.

Up to this time the experiments had been conducted in a walled inclosure, were no other Grass was permitted to grow, and far from any other grain crop. The corn was always sown in the autumn, ripening in the years above indicated. But M. Fabre now transferred his experiment to the open field, sowing his *Aegilops* Wheat broadcast. In this way he cropped a field, near the road from Marseillan completely surrounded by Vines, and far from any Wheat field. For four consecutive years he persevered in his trial, obtaining every year Wheat like that of the neighbouring farms, and sixfold or eightfold according to the season. In 1850 the straw was stiff and full; the ears nearly smooth, and composed of from eight to 12 spiklets, each containing two or three grains of corn, which were very floury and scarcely at all concave. The crop was however very short this year owing to excessive dryness, which greatly injured all of the cereal crops. Thus "during the twelve consecutive years," remarks M. Fabre, "in which I have pursued the cultivation of *Ae. triticoides*, I have found it gradually improving, and becoming real Wheat; but I have never seen an instance of its running back to the *Ae. ovata* from which it sprung.

II.

(Gardeners' Chronicle, 21 Juli 1852)

No fact in natural history more pregnant with consequences has been elicited than that of transformation to which we drew the attention of the public. That a miserable Grass, should in no more than 12 generations become such an important article of food as Wheat, would have been incredible, in the absence of the direct and positive testimony that has been produced by M. Fabre. So unlike are the alpha and omega of this experiment, that botanists, with one consent have placed them in distinct genera, and yet the plants are shown, by the plainest evidence, not only to belong to the same genus, but even to the same species. The value of modern genera and species in botany is woefully shaken by this revelation; faith in those lower classes of botanical distinctions, which have been said to represent permanent natural differences, is gone; and it is to be hoped that refinements in classification, as they have been absurdly called have received their coup de grace. The ingenious gentlemen who have believed that 20 species of *Aconite* are confounded under *A. Napellus*, half a hundred *Milwos* under *Salix caprea*, and as many species of *Rubus* under *Rubus corylifolius*, may burn their books for their trifling distinctions can hardly continue to find admirers after the proof that an *Aegilops* and Wheat are the same species. For our own part, we console ourselves with the belief that botany will be

thus restored to the condition of an intelligible science; and we congratulate those who, like Bentham, Hooker and others, have for a quarter of a century carried on an unsuccessful war with hairsplitting contemporaries, upon the final triumph of their principles!

Passing by this point of view, we may also suggest that other unsuspected instances of the same kind are very likely to occur. We are ignorant of the origin of Rye; but Rye is less different from Wheat than is *Aegilops*, and may very well be another *Aegilopian* form. So again of Barley, the wild state of which is just as uncertain; we may now expect that some clever experimenter will trace it to an origin as surprising as that of Wheat. But these are matters of mere scientific interest. Let us see to what practical inferences M. Fabre's discovery may lead. That gentleman found that a wild Grass (*Aegilops ovata*) was subject to what gardeners call "a sport" (*Aegilops triticoides*). Of that sport he sowed the seeds, and he found that while on the one hand there was no disposition to return to its original form, there was on the other a decided tendency to sport still more. Of that tendency he availed himself with admirable patience.

Year by year the change went on — but slowly. Little by little one part altered or another. The wretched, hungry grain grew plumper; the flour in it increased; its size augmented. The starved ears soon formed other spiklets; the spiklets at first containing but two flowers at last became capable of yielding four or five. The straw stiffened, the leaves widened, the ears lengthened, the corn softened and augmented, till at last Wheat itself stood revealed, and of such quality that it was not excelled on the neighbouring farms. All this too, be it observed, was done on a large scale; it was no obscure laboratory experiment, but the result of a farming operation, carried on in the open fields. Men must be blind indeed who cannot see to what this points. We shall leave our agricultural friends to reflect upon the prospects that are open to them; it is for them to double the length of their ears of corn, and augment their grain — to go on, in short, in crowds, in the track that a few only of the most intelligent are following now. We must limit our horizon to the boundary of a garden. If any men know the importance of "sports," they are gardeners. Half the most striking of the flowers and fruit have been thus obtained. A poor ugly dwarf Larkspur sports by chance to double; the seeds of the sport are saved carefully and sown; three fourths of the seedlings are single, but a few are double; the first are thrown away, the best of the second are saved for seed, and the second crop of seedlings comes truer. So comes the race of double Larkspurs.

A double Larkspur next sports to a stripe, that is to say, bands of red or of violet appear upon the pale ground of the petals of a few flowers; these flowers are marked, the seed is saved, and so begins the breed of what are called Uniques, at one time the pride of flower garden, though now discarded for newer favourites. In the same way, first came Camellias, Chrysanthemums, and a host of others. The old purple Chrysanthemum accidentally sported to buff; the buff

branch was struck, proved true to its new nature, and became the ancestors of a race of buff's. The colour of a red Camellia „breaks;“ red streaks appear in the flowers of a sporting branch; that branch is separated from its tranquil mother, and elapped upon a stout stock; on goes the sportive branch, retains its tendency, produces striped flowers all the better for the new blood infused into them, and the tendency is fixed; skilful gardeners cut it limb from limb, and every mutilated morsel starts into life another variegation. It is the same with vegetables; a wild Carrot accidentally found in cultivated ground, refuses to run to seed, but employs itself in building up a root stouter than any Carrot had been before. The watchful eyes of a gardener remark the change; the changeling, still a sport, flowers at last; its precious seeds are saved, and committed to still richer ground. Nine-tenths of the seedlings run back to the wild form — your Carrot is but an intractable gentleman after all; but a very few prove obedient to the will of man, shake off your savage habits, refuse to flower till the second year, meantime spend their autumn and winter in the further enlargement of their roots, then rise up into blossom invigorated by six months' additional preparation, and yield more seeds, in which the fixity of character, or, if you will, the habit of domestication, is still more firmly implanted. And thus begins the race of Carrots.

Nectarines, Pears, Peaches, Plums, and other valuable fruits, must be supposed to have in numerous instances derived their origin from similar circumstances; they were far more the children of accident than design, and we see to what they have come. Gardeners, then, should keep a watchful eye upon every tendency to sport, which they may remark among the plants entrusted to their care. The sports, however unpromising, should be made the subjects of repeated experiment; year after year seed should be saved, seed beds, „rogued,“ and attempts made to secure fixity of character. If they end in nothing, as they often will, such experiments have the advantage of also costing nothing; but if they lead to a good result a permanent gain is secured. We see no reason why Gourds should not be bred into Melons; at least we know to our cost that Melons are easily bred into Gourds. There is nothing impossible in the Miller's Burgundy Grape transforming into a sort with berries as big as Muscats; or in a Leek gaining a bulb as solid and round as a Tripoli Onion; or in a Raspberry bearing berries as fine as a British Queen Strawberry: such changes are far more likely to happen than the transformation of Aegilops into Triticum; what they want for their accomplishment is time, patience, and an intelligent knowledge of the nature of plants, and a fixed residence; with all which gardeners as a body are better provided than any other class of society. To them we earnestly recommend the steadily pursuit of M. Fabre experiments. If any one should succeed in the course of a dozen years in giving a Raspberry the dimensions of a Mammoth Strawberry, he will deserve to be placed by the side of the great inventor of the Crystal Palace.

III.

(Gardeners' Chronicle, 7. August 1852.)

Letter to the Editor of the Gardeners' Chronicle.

Your announcement of M. Esprit Fabre's discovery is certainly startling, and if confirmed, will indeed go a long way to give the coup de grace (as you remark) to our faith in the value even of generic distinctions. Indeed, if we are to receive the results of M. Fabre's experiments as undoubted facts, in arriving at which there could have been no latent sources of error, all our a priori incredulity is to the probability of the old stories of Oats having become Rye etc., is at once removed, and our considered settled notions respecting the permanence of specific distinctions woefully shaken. Truly this discovery will afford a triumph to the talented author of the „Vestiges of the Natural History of Creation.“ The case is in fact so novel, and partakes so of the marvellous, that every thing belonging to it must interest all true lovers of science, and all scientific lovers of truth. It is therefore most desirable that the new Wheat plant of M. Fabre should be carefully compared with the old form, in order to settle their identity (if they be identical) or otherwise to show in what particulars they differ from each other, and this examination should extend to every part of the plant, and the microscope should be called in to assist in the investigation. Seeds of the new Wheat should be sent to this country and sown on the best and worst Wheat soils, the former to ascertain if it admits of further development, the latter to induce it to revert back to its normal conditions of *Ae. ovata*. It would also be most interesting to your botanical readers, if you could show them side by side, in a cut, drawings of the original *Ae. ovata*, the *Ae. ovata* var. *triticoides*, the fully developed Wheat plant of M. Fabre and the old denizen, together with magnified sketches of the floral organs. We should then be able to see and judge for ourselves of the extent of the mutation which appears to have taken place between the alpha of the „Sicilian“ weed and the omega of our noblest cereal. It would be further interesting to state what was considered to be the essential generic character of *Aegilops* and *Triticum* respectively, that we may see by what changes the one has glided into the other. Perhaps the strangest part of M. Fabre's experience is, that in no instance had he observed a retrogression from the nascent Wheat back to its vile ancestral type. It would, moreover, be important to ascertain how hardy the new plant is, whether it would bear, for instance, the climate of the North and East of England; also how hardy *Ae. ovata* is. Your readers would be glad also to know where Professors Dunal's pamphlet and also where specimens of *Ae. ovata* (its normal and abnormal phases) could be procured. The subject is one of surpassing interest. W. Marshall; Ely. [M. Fabre's pamphlet contains figures of all the object which our correspondent wishes to see, but we cannot incur the expense of reproducing them. About the facts there is no doubt. We have purposely avoided treating the question in a merely botanical point of view; we may, however, observe that doubts about the soundness of the generic distinctions of *Triticum* and

Aegilops were expressed many years ago by Palisot de Beauvois. Editor of Gardn. Chron.]

IV.

(Gardeners' Chronicle, 2. October 1852.)

Major Munro produced, in one of the meetings of the British Association for the Advancement of Science, a series of specimens of Aegilops, to show the gradual transition of *Ae. ovata* into *Ae. triaristata* and triticoides, and stated that the Gardeners' Chronicle had recently detailed the particulars of an experiment extending over several years, and carefully carried on by M. Esprit Fabre, from the results of which it was evident that he had succeeded in converting the wild Sicilian worthless Grass into good useful Pétanielle Wheat. Indeed to sudden was the change, that M. Fabre published in the „Comptes Rendus,“ of 1839, one of the first years of the experiment, a short account stating that he had succeeded in producing Wheat from Aegilops triticoides Req. Some persons have argued that this fact indicates the nonexistence of genera, and many even now have resumed the belief that Wheat can be changed into Barley, and Oats into Rye, and it would be as well that the minds of these persons should be disabused of such notions. A genus is difficult of definition, but is a good term to apply to one of those divisions or groups of plants within the wide range of which species can wander, but beyond which they cannot go. The opportunity of seeing a large number of specimens of any particular family, such as Major Munro stated he had recently enjoyed with Grasses, convinced him that it was possible, without the aid of powerful glasses, to place with very slight examination the greater number of Grasses at once in their proper genera. Sometimes it would be difficult to define in words the exact differences, but the eye distinguished them at once. The author then explained with diagrams the difference between the genera Hordeum, Secale, Triticum, and Avena, and contended that no one genus of these forms could be converted into either of the others.

On the contrary, it had long been suspected by botanists that Triticum and Aegilops were identical; and Pal. de Beauvois, in 1812, in his valuable illustrations of the genera of Grasses, and with rather a tendency to subdivide genera said that he could discover no difference between Triticum and Aegilops. There is no real difference and therefore the change above mentioned, although curious, is not contrary to the laws of genera. Wheat itself varies wonderfully, the smooth red kind being externally unlike the long bearded variety, now cultivated for its very great produce in many parts. The author also stated as a guide in coming to conclusions on the subject, that, in all the numerous instances of abnormal structures that had come under his observation, on at least 30 different genera of Grasses, the universal tendency in the spikelet was to elongate its axis, and to increase its number of flowers; and never in one solitary instance observed to become fewer flowered than in the normal state. — Dr. Arnott observed, that several botanists, and himself among the number, were not yet convinced of the actual transmutation of Aegilops ovata into Triticum.

V.

(Gardeners' Chronicle, 18. December 1852.)

The following passage has been pointed out by a friend, in the works of Sir Thomas Brown, vol. 1, book 3, ch. 17, p. 306; Bohu's edition, 1852. „But in plants, wherein there is no distinction of sex, these transplantations are conceived more obvious than any; as those of Barley into Oats, of Wheat into Darnel; and those grains which gradually arise among other corn, as Cockle, Aracus, Aegilops, and other degenerations, which come up in unexpected shapes, when they want the support an maintenance of the primary and master forms.“

Is there positive proof of the origin of Wheat from a Grass belonging to a different genus?

By L. C. Treviranus.

(Gardeners' Chronicle, 14. April 1854.)

The question where those objects of cultivation originated which are so indispensable to man in a state of civilisation does not, when taken by itself, admit of any general answer; but considered in a wider extent, can only be answered conditionally. For either the answer is inseparable from the general question as to the development of the human race, and so far lies out of the range of experience, or we must assume that these objects were found by man in a state of nature, and in the condition in which they were found applied to his uses; or, finally, that they at first existed in a certain form which has been modified by the agency of man, so that the original state is no longer extant, or if so, in such a condition as not to exhibit the transition from the cultivated plant to the parent from which it was derived. The first method of reply holds the question as in itself unanswerable, and in some measure coincides with those views which regard the objects of cultivation, such as the Laurel, the Myrtle, the Vine, the different kinds of corn, etc., as the gifts of the Gods, that is, of beings who introduced cultivation into the earth from their unknown habitations. The second answer to the question must have been received unconditionally as the right one, were it clear that our cultivated forms have ever been found wild, or still are found so; that is, whether they have ever lived or still live in any specific locality independently of the agency of man. But the necessary proofs are altogether wanting.

When Dureau de la Malle would make it probable from historic dates that the part of Palestine and Syria which borders on Arabia is the parent country of corn, namely, of Wheat and Barley (Ann. de Sc. Nat. ix. 61); when Heintelmann would consider Wheat as growing wild in the country of the Baschkirs, and A. Michaux Spelt in the mountains in the north of Hamadan in Persia (Lamarek, Encyc. Bot. ii. 458), we must bear in mind that, as regards the first, we can place very little reliance upon the accounts of the occurrence of species by persons who were little acquainted with objects of natural history, or upon their description or pictorial illustrations; and that, in respect of the other instances, a far longer residence than falls to the lot of travellers in general in the countries where they

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