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 powerfull 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 spiklet 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; Bohn'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 Heinzelmann 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 (Lamarck, 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

are supposed to have taken their origin is requisite, in order to distinguish the wild state of a plant from such as have merely escaped from cultivation. There remains, then, only in answer of the question, that a typical form of these plants originally existed, which has been so modified by art and human skill, in conformity with man's necessities or uses, that it is no longer capable of being recognised as such, though existing in its wild state, or together with the form produced by culture. That such alterations of plants have been effected by cultivation, and are now become permanent, is beyond question. Our biennial cultivated Carrots, with their succulent well-flavoured roots, may be produced in perfection after some generations, by the art of the gardener, from the annual wild form, whose root is dry and of an acrid taste (Lond. Hortic. Soc. Trans. ii. 348). We cannot, however, prove the origin of other cultivated plants by experiment; we are ignorant, for instance, how the Cauliflower originated from the normal from of our Coleworts. The wild form of our Potatoes is far from being perfectly known. Of many forms found apparently wild in the lower mountains of South America and Mexico, which have been introduced into systematic natural history under the names of Solanum Commersoni, maglia, etuberosum, immite, verrucosum, utile, stoloniferum, etc. (D. C. Prod. Syst. Veg. xiii s. 1, 32, 677; J. D. Hooker, Bot. Antarct. Voy. 32), sometimes one, sometimes another is brought forward in proof that an alteration of the original form has been effected by culture, which by repeated reproduction has become permanent, but whose derivation from that particular species has not been observed. A similar origin has been assumed for our species of corn, especially for the most important of them, viz., Wheat, but no one had succeeded in indicating the original form, and the alterations which had taken place. That this, however, has been effected we are assured by M. Esprit Fabre, an intelligent gardener at Agde, near Montpellier, to whom we are indebted for some excellent observations on the plants of his rich neighbourhood (Ann. des Sc. Nat. 2. Ser. vi. 378, 3 Ser. xiii. 122). The observations on which this result is grounded have been published by the author himself very briefly in a small pamphlet entitled „Des Aegilops du midi de la France et de leur Transformation," 20 s. in 4to., with three lithographic plates; and Prof. Felix Dunal, of Montpellier, has added a short preface and appendix, and I have myself, when at Montpellier in the autumn of 1851, had an opportunity of examining some dried specimens of the plants resulting from the experiments of M. Fabre, which had been communicated by him to his friends in that neighbourhood. M. Fabre considers Aegilops ovata and Ae. triaristata, of which the first especially abunds everywhere on the coasts of the Mediterranean, as the parent plants of our Wheat, an opinion by no means new, but one which had never before been supported by such weighty arguments. The genera Aegilops and Triticum, it is well known, though they agree in inflorescence, in the multitude of flowers, and in the general form and texture of the parts of fructification, differ in this respect, that the glumes in Aegilops are more swollen, that the upper spikelets are abortive, containing no ovaries but only stamens, and that the fruit, instead of being convex on either side, as in Wheat, in concave. The presence and number of the awns is inconstant in either genus, and in a species or form of Aegilops which Requien found in Provence, and named Ae. triticoides, but which occurs in Sicily, at Palermo, as appears from specimens now before me, and, if as I believe, Link's Crithodium Aegilopoides (Linnaea ix. 132, t. 3) be the same thing, in Greece also, the glumes are gradually flatter, so that their form, especially as at the same time there is but one awn instead of several, approaches very closely to that in the genus Triticum. Fabre, whose attention was attracted by this phenomenon, undertook in consequence a series of experiments with Ae. ovata, which he cultivated with the greatest care for 12 years, from 1838 to 1850, and at first in a plot of ground inclosed by walls, in which no other species of Grass existed, and afterwards in the open field, surrounded however by vineyards. The result of this experiment was that the plant acquired longer ears, whose rachis was not brittle as before when ripe, and in which, step by step, fewer blossoms were abortive; the glumes, meanwhile, were less broad and flatter; instead of a number of awns, in general one only remained; and the ripe grain, which in consequence of its concave form remained inclosed in the hollowed glume, burst out by reason of its increased thickness. In brief, the species Aegilops ovata had acquired a form, represented in the figures, which every one must recognise as that of a Triticum, and which in continued cultivation was retained without any tendency to return to its original condition. M. Fabre observed also that Ae. triaristata Willd. was subject to the same metamorphoses, only he became acquainted with this species too late to make the same experiments with it which he had made with Ae. ovata, so as to be able to prove its transition into Triticum. His treatise closes with these words: „We had here also (instead of Aegilops ovata with which the experiment was commenced) a Triticum, a true species of Wheat, which cultivated in the open field for four successive years retained its form and yielded harvest like that of other corn of this kind:" and M. Dunal adds, „We are in consequence compelled to allow, that certain of our cultivated kinds of Wheat, if not all, are nothing more than peculiar forms of certain species of Aegilops, and that they can be regarded as none other than races of these species, so that to M. Esprit Fabre belongs the honour of having demonstrated the true origin of cultivated Wheat, which others before him only imagined and have indicated doubtfully."

Whatever consideration, however, may be due to this expression of so acute and practical an observer, who not only from personal acquaintance with a near neighbour, but from an immediate inspection of the result obtained by these experiments, was in a condition to judge of the correctness of the observations, and the justice of the inferences, the subject is too important, not to make one wish for a repetition of the experiments by a combination of many persons of different views — experiments which are easy of repetition, and have no other difficulty than the length

of time requisite before the necessary result can be attained. We have before us the coincidence of two genera so different in apparently essential characters as Triticum and Aegilops, and the question arises, if a transition between these is established, must not other genera of Gramineae in a similar way fall to the ground? But more especially, inasmuch as the normal condition of the several species of Aegilops is maintained in their native localities, it is requisite to know more perfectly than we have learned from M. Fabre, what are the conditions and influences under which the observed changes have taken place, before we can regard the results which have been obtained as perfect verities in the annals of science and agriculture.

Verwandlung von Aegilops in Triticum.

(Gartenflora, 1853, p. 280.)

Von Neuem tauchen wieder die längst beseitigt geglaubten Umwandlungen von einer Pflanzen-Gattung in andere Gattungen auf. Das oben angegebene Factum will ein Herr Fabre beobachtet haben und ward dasselbe in der Revue horticole mitgetheilt. Die Redaction der Revue horticole sprach ihre gerechten Zweifel dagegen aus, jetzt aber baut eine Autorität wie Dr. Lindley Schlüsse darauf, welche, wenn sie wirklich von einer sichern Basis ausgingen, im Stande wären, alle unsere Gattungen über den Haufen zu werfen. — Umwandlungen von einer Pflanze in die andere sind nur dann möglich, wenn die betreffenden Arten nur Formen der gleichen Pflanzenart sind, und fälschlich als eigene Arten aufgestellt wurden. Eine Umwandlung, wie von Aegilops in Triticum widerspricht aber allen directen Erfahrungen so gänzlich, dass wir mit Sicherheit behaupten dürfen, dass hierbei Täuschung obwaltete, welche wir in diesem Falle für eine zufällige und keine absichtliche halten.

Ganz unrichtig stellt Lindley die zahlreichen Formen von den Gattungen Salix, Aconitum, Rubus u. s. f., in die gleiche Categorie von Erscheinungen, indem er sagt, auch hier seien eine Masse von Arten durch den Einfluss der Cultur in einander übergegangen. Der grosse Unterschied zwischen den zahlreichen Arten dieser Gattungen und der von Fabre behaupteten Umwandlung von Aegilops in Triticum liegt aber darin, dass die Mehrzahl der Arten der Gattung Aconitum, Rubus und Salix, eben nur Formen der gleichen Art sind, die durch Einfluss des Bodens, Standort etc., in der freien Natur sich gebildet und fälschlich von einzelnen Botanikern als Arten aufgestellt wurden, während andere sie gleich von vornherein als Abarten erklärten. Werden solche durch äussere Einflüsse entstandene Formen unter durchaus gleichartigen Verhältnissen in den Garten gebracht, so ist es ganz natürlich, dass sie alle nach und nach zur Stammform zurückzukehren die Neigung besitzen, namentlich wenn sie im Garten durch Samen vermehrt werden. Unter dieser Categorie von Pflanzen wird man noch viele andere Gattungen nennen können, in denen eine Menge schlechte Arten aufgestellt worden sind, s. z. B. die Gattungen Hieracium, Fumaria, Isatis, Aquilegia, Iberis u. s. f., und wenn namentlich noch einige französische Botaniker anfangen sollten, eine ähnliche Unzahl von Varietäten als Arten aufzustellen, wie dies neuerlich z. B. Jordan und andere gethan, dann werden wir bald Gelegenheit bekommen, noch viele Versuche im Garten zu machen, um vermeintliche Arten sich umwandeln zu sehen. — Die Umwandlung von Aegilops in Triticum dagegen beruht auf einer reinen Unmöglichkeit, denn wir haben hier 2 so verschiedenartige Typen vor uns, wie z. B. eine Katze und einen Löwen, und es wird gewiss Niemandem einfallen, daran zu denken, durch den Einfluss der Cultur aus dem Löwen eine Hauskatze zu machen. Ähnliche Geschichtchen von Umwandlung von Bromus sterilis in Roggen, von Weizen in Taumellolch, von Täschelkraut (Thlaspi) in Senf (Sinapis) u. s. f., berichtete seiner Zeit Herr E. von Berg von Neukirchen uns Deutschen, und schrieb ganze Bücher darüber. Setzen wir daher jetzt, wo ähnliche lächerliche Behauptungen von Neuem auftauchen, dieselben gleich von Anfang dahin, wohin sie gehören, nämlich in das Gebiet der absichtlichen und unabsichtlichen Selbsttäuschungen, in das Gleiche, wohin auch das Gespenstersehen, Tischrücken u. s. f. gehört. (E. R.)

Verwandlung von Aegilops in Triticum.

(Hamburger Gartenz., Jahrg. X. p. 34.)

Das Urtheil über die Aegilops-Frage in der „Gartenflora“ (Septemberheft 1853) des Herrn E. R. können wir nicht mit Stillschweigen übergehen. Die Exemplare, welche die allmäligen Übergänge von Aegilops in Triticum darthun, waren hier in London ausgestellt und haben Jeden überzeugt, dass die Sache keine blosse Zeitungsente ist. Hätte Herr E. R. klug sein wollen, so hätte er daraus den Schluss ziehen sollen, dass die in Frage stehenden Gattungen keine natürliche, sondern nur künstliche seien, und dass Gattungen (Genera) nicht blosse willkürliche Begrenzungen, sondern von der Natur gemachte Beschränkungen oder Schranken seien. Ein solches Argument würde freilich eine schlagende Ironie auf diejenigen Botaniker sein, welche die Bildung von Gattungen nur als Mittel zu betrachten scheinen, ihre Namen als Autoren anzubringen. Von gärtnerischem Standpunkte aus ist die Sache von der grössten Wichtigkeit. Beweist sie nicht, dass Gattungen und Arten nicht als feststehend zu betrachten sind, ehe sie nicht von der Hand des Gärtners geprüft? — Und erhält der Gärtner durch ein solches Eingeständniss nicht eine neue Macht, eine höhere Würde? Wahrlich, es sieht schlimm aus, wenn diejenigen, welche die Verpflichtung übernommen haben, die Gärtnerei zu fördern und das Ansehen der Gartenkunst zu erhöhen, Gelegenheiten wie diese so unbenutzt vorübergehen lassen, oder sogar sich ermessen, unumstössliche Thatsachen in den Kreis der Lächerlichkeit zu ziehen. — Der Aegilops-Fall erinnert an einen ähnlichen Vorfall. Es ist ja noch nicht viele Jahre her, seit John Smith eines Abends die Linné'sche Gesellschaft in London dadurch in Erstaunen setzte, dass er berichtete: im Garten zu Kew befinde sich ein einziger Euphorbiaceen-Strauch, der nur weibliche