NOTICES OF NEW PUBLICATIONS.

THE VARIATION OF ANIMALS AND PLANTS UNDER DOMESTICATION. By Charles Darwin, M. A., F. R. S., etc. With a Preface by Prof. Asa Gray. In two volumes, with Illustrations. New York: Orange Judd & Co.

Darwin in his great work, "Origin of Species," broached the theory that all living creatures descended from a single prototype. In that work he promised at some future day to give us his reasons for this theory. The work before us is the fulfillment of that promise. As a most valuable contribution to scientific literature it will be hailed by men of learning everywhere, for it is the most wonderful storehouse of facts that has ever been gathered together in one book, and these facts have a higher significance than those of Geology or Astronomy, or even Chemistry, for they are all facts relating to life. If they do not deal largely with human life they at least prepare the way for a future Darwin.

Darwin reasons from the known to the unknown in the largest sense of the term. He shows us how great have been the variations of plants and animals under domestication, leading us to believe from this, that if the time is sufficiently extended, all the variation which is seen in the animal and vegetable world may be accounted for without separate creation for different species. Much of this variation is the result of "natural selection," made necessary by the "ever-recurrent struggle for existence," in which those variations, however slight, which are favorable, are the ones which are preserved, while those which are unfavorable are destroyed. This natural selection has been going on ever since living creatures inhabited the globe, and more now than ever before, because man brings his own intelligence to bear upon the subject. The principles of selection under the influence of man, he divides into three kinds, *Methodical Selection*, in which man endeavors to modify a breed to some standard; *Unconscious Selection*, the result of choosing the most valued, and destroying the less valued individuals; and *Natural Selection*, in which is implied that those plants or animals best fitted for life, survive and propagate their kind. We must content ourselves with a few selections taken almost at random, but which will illustrate the character of the work, and we hope give our readers such a taste of it that they will desire the two volumes for their libraries. The first extract refers to the variation which takes place in our well-known wheat plant when exposed to various modes of culture, and different climatic conditions:

"Wheat quickly assumes new habits of life. The summer and winter kinds were classed by Linnæus as distinct species; but M. Monnier has proved that the difference between them is only temporary. He sowed winter wheat in spring, and out of one hundred plants four alone produced ripe seeds; these were sown and resown, and in three years plants were reared which ripened all their seed. Conversely, nearly all the plants raised from summer wheat, which was sown in autumn, perished from frost; but a few were saved and produced seed, and in three years this summer variety was converted into a winter variety. Hence it is not surprising that wheat soon becomes to a certain extent acclimatised, and that seed brought from distant countries and sown in Europe vegetates at first, or even for a considerable period, differently from our European varieties. In Canada the first settlers, according to Kalm, found their winters too severe for winter wheat brought from France, and their summers often too short for summer wheat; and until they procured summer wheat from the northern parts of Europe, which succeeded well, they thought that their country was useless for corn crops. It is notorious that the proportion of gluten differs much under different climates. The weight of the grain is also quickly affected by climate: Loiscleur Deslongchamps sowed near Paris fifty-four varieties, obtained from the south of France and from the Black Sea, and fifty-two of these yielded seed from 10 to 40 per cent. heavier than the parent seed. He then sent these heavier grains back to the south of France, but there they immediately yielded lighter seed.

"All those who have closely attended to the subject insist on the close adaptation of numerous varieties of wheat to various soils and climates, even within the same country; thus Colonel Le Couteur says: 'It is the suitableness of each sort to each soil that will enable the farmer to pay his rent by sowing one variety, where he would be unable to do so by attempting to grow another of a seemingly better sort.' This may be in part due to each kind becoming habituated to its conditions of life, as Metzger has shown certainly occurs, but it is probably, in main part due to innate differences between the several varieties.

"Much has been written on the deterioration of wheat; that the quality of the flour, size of grain, time of flowering, and hardiness may be modified by climate and soil, seems nearly certain; but that the whole body of any one sub-variety ever becomes changed into another and distinct sub-variety, there is no reason to believe. What apparently does take place, according to Le Couteur, is, that some one sub-variety out of the many which may always be detected in the same field is more prolific than the others, and gradually supplants the variety which was first sown."

How came our grains and fruits to be of the improved sorts so valuable to man is an interesting question, as they undoubtedly were originally wild and uncultivated. A single paragraph on this point will show no doubt the correct process:

"The savage inhabitants of each land, having found out by many and hard trials what plants were useful, or could be rendered useful by various cooking processes, would after a time take the first step in cultivation by planting them near their usual abodes. Livingstone states that the savage Batokas sometimes left wild fruit trees standing in their gardens, and occasionally even planted them, 'a practice seen nowhere else among the natives.' But Du Chaillu saw a palm and some other wild fruit trees which had been planted; and these trees were considered private property. The next step in cultivation, and this would require but little forethought, would be to sow the seeds of useful plants; and as the soil near the hovels of the natives would often be in some degree manured, improved varieties would sooner or later arise. Or a wild and unusually good variety of a native plant might attract the attention of some wise old savage; and he would transplant it, or sow its seed. That superior varieties of wild fruit trees occasionally are found is certain, as in the case of the American species of hawthorns, plums, cherries, grapes, and hickories, specified by Professor Asa Gray. Downing also refers to certain wild varieties of the hickory, 'as being 'of much larger