DARWIN AND DOMESTICATION.

Darwin's late work "Animals and Plants under Domestication," has just been issued in this country by Orange Judd & Co., of New York. It has been very highly spoken of in England and comes to us with an excellent reputation. The popular problem of modern science seems to be the *Origin of Species*, and of late years, it has been shaking the moral and intellectual world as by an earthquake. Half a century ago the French naturalist, Lamarck, propounded his theory which met with little else but ridicule, while twenty years since the anonymous work "Vestiges of the Natural History of Creation" made its appearance. Though this latter was far more unpopular then than it would be to-day, it was learned and lucid —ran through several editions and was manifestly the forerunner of Darwin's "Origin of Species." The intense interest which this last work created is as well known as the great opposition it has met with from many sources. The objectors to the theory can but admire the candor and modesty with which it is put forth, while the fact, that the tide of opinion among naturalists is setting strongly in favor of it, and that such men as Asa Gray, Draper, Hooker, Lubduck, Herbert, Huxley, Owen, Lyell, Bates, Grove, Wallace, Tyndall, Spencer and others, advocate the same or very similar opinions, should have some weight with those who have never given any attention to the matter.

The theory is, briefly, that, since selection by man has produced such wonderful modifications in our different races of both plants and animals; natural selection, the result mainly of the "struggle for existence," first propounded by Malthus, together with change of conditions and of climate—accumulating these differences for ages, have produced our natural species. The facts which have been accumulated in corroboration of the theory, must however, be alike interesting to the believer or disbeliever in it, and as the very general prejudice against his first work may proscribe the one under consideration from many a household, it will not be amiss to jot down in a desultory way a few of those which more particularly interest the agriculturist. The professed object of the work is to demonstrate the amount and nature of the changes which animals and plants have undergone while under man's dominion. Speaking of parentage, he thinks the dog has certainly had a multiple origin, while he favors the belief that cats have had a common one. The dog has varied more and given us more distinct breeds than the cat, on account of the night-prowling habits of the latter, precluding that selection which the dog has been subjected to. Though the history of the horse is lost in antiquity he believes it to be descended from the quagga, and cites the continual appearance of stripes on dun-colored horses as instances of reversion to that type. The ass has descended from the wild *Asinus Tæniopus*, and though there are distinct breeds, it has varied less than the horse on account of its lesser value, and of its being kept mostly by poor people, who do not rear large numbers, nor carefully match and select the young. Pigs have descended from two forms, sheep from several, goats from one or two, and rabbits from one form. Though cattle have probably descended from several wild types, every farmer knows what wonderful modifications they have undergone, as witness the introduction of short-horns during the present century. The chapter on pigeons is especially full and comprehensive, and he shows conclusively that all the improved races are descended from the wild Rock pigeon, *Columba livia*, and they differ so essentially both in their skeleton and form, that if found wild in nature they would be classed as distinct species. The wild *Gallus bankiva* is supposed to be the prototype of our present breeds of chickens, while our ducks have descended from the wild representative *Anas boschas*. To show how rapidly modification sometimes results under domestication, Mr. Hewitt found that his young wild birds, always changed and deteriorated in character in the course of two or three generations, notwithstanding that great care was taken to prevent any crossing with tame ducks. After the third generation his birds lost the elegant carriage of the wild species, and began to acquire the gait of the common duck. They increased in size in each generation, and their legs became less fine. The white collar around the neck of the Mallard became broader and less regular, the wing feathers became more or less white, etc., etc. The most capable judges are convinced that the goose has descended from the wild Gray-lag goose, *A. ferus*, the young of which can easily be tamed, and it is worthy of notice that this bird has varied but little under domestication, and Darwin accounts for it by selection not having come largely into play. Birds of all kinds which present many distinct races are valued as pets or ornaments; no one makes a pet of the goose; the name, indeed, in more languages than one, is a term of reproach. The goose is valued for its size and flavor, for the whiteness of its feathers and for its prolificness and tameness; in all of which points it differs from the wild parent form, and these are the points which have been selected. The turkey is descended from the wild Mexican species, *Meliagris Mexicana*, which, it appears, was domesticated by the natives of this country before its discovery by Columbus. Practically our farmers are little concerned in the Peacock, Guinea-fowl, Gold-finch and Canary. The latter bird has been domesticated but 350 years, and yet we have top-knotted, frilled and feather-footed breeds. Though bees have varied, still it is in but small degree, which is accounted for by the almost impossibility of bringing selections into play by pairing particular queens and drones, as they unite only during flight. Here is a striking illustration of instinct suffering from domestication: The silk-worm when placed on a mulberry tree, often commits the strange mistake of devouring the base of the leaf on which it is feeding and consequently falls down.

With regard to plants, as this is intended but for a brief notice, the numerous facts given cannot even be synopsized upon. Suffice it to say that well nigh all our vegetables have been modified mostly, in those parts useful to man. The cabbage has undergone remarkable changes in the leaf and stem, but not in the seeds, while peas have varied in the pod more than in the vine. Potatoes have varied most in the tuber and even the mulberry has varied in the leaf on account of selection. The weight of the wild gooseberry has been increased between 7 and 8 times, but with no comparative change in the bush. The common turnip and oil-giving rape are shown to be one and the same thing, and the one can in a short time be produced from the other. When we consider these several facts, and that we do not owe a single useful plant to Australia, the Cape of Good Hope, or to any uninhabited island, notwithstanding their numerous endemic species; the fact becomes apparent, without entering further into detail, that most of our present fruits and vegetables have been produced by man's agency, i. e. mainly by selection and cultivation. In this light the words of Prof. Asa Gray, "that variation has been led along certain beneficial lines like a stream along definite and useful lines of irrigation" come well nigh the truth.

That the peach is but a modified almond, there is little doubt, and it is a well known fact that the peach tree occasionally produces nectarines and *vica versa*. Our apricots come from a single variety found wild in the Caucassian region, while the different plums are descended from the Bullace, or *Prunus insititia*. Speaking of the apple he mentions the fact that the well known bloom is almost entirely peculiar to Russian varieties; and in reference to the sexes of the Strawberry, that the true Hautbois, though properly bearing male and female organs on separate plants, frequently produces hermaphrodites; and Lindley by propagating these latter by runners, at the same time destroying the males, soon raised a prolific stock.

The principle of Reversion or Atavism, is treated of at considerable length, and some of the cases are truly astounding. Thus the frequent dropping of black lambs in the purest flocks of sheep of all breeds, is accounted for on the supposition that the primordial sheep were dark (of which there is good evidence) and of reversion to that type. Whenever a bird appears in any of the different races of the pigeon, with blue wing-coverts, they always have the marks which characterize the wild Rock pigeon, and which concur in no other wild species. Crosses between varieties frequently thus revert, and thus prove an index to the parent species. For instance, Mr. Darwin produced a cock bearing the closest resemblance to the wild *Gallus bankiva* by crossing a Black Spanish cock with a white Silk hen, both of which kinds are known to breed true *inter se*.

The good effects of crossing, so far as constitutional vigor and size are concerned, are made patent in this work, and many instances, such as crossed wheat never blighting, might be given, while a large array of facts show the evil effects of close interbreeding, though it is worthy of remark that it may be practiced with less evil effect with cattle and sheep, than with any other animals. As Andrew Knight and Kolreuter however, have hinted, it seems to be a law of Nature, that organic beings shall not fertilize themselves for perpetuity, as witness the many adaptations in nature for compelling or favoring the crossing of distinct individuals.

As to the effects of long continued bud or short propagation, which is thought by many to be injurious, it is made manifest that plants may be propagated for a long time in this manner. Who ever saw the Horseradish produce seeds, for instance? and yet how difficult of eradication it is!

Thus much for a hasty glimpse at the subject-matter of the book, and whether believing in his hypothesis and general deductions, which occupy the last part of it, or not, no one can peruse the work without being the gainer, for it is in fact an Encyclopædia of facts, interesting especially to the husbandman — a fund of knowledge and discovery, which very large experience and ample means alone could enable one to acquire.

The great practical question rests on whether or not there is any limit to variation. The opposers to Darwinism affirm that there is, and cite rinderpest, peach rot, etc., as Infinite provisions against improvement beyond a certain point. To quote Darwin's own words: "In some lines of variation the limit has propably been reached. Youatt believes that the reduction of bone in some of our sheep has already been carried so far that it entails great delicacy of constitution. But seeing the great improvement within recent times in our cattle and sheep, and especially in our pigs; seeing the wonderful increase in weight in our poultry of all kinds during the last few years, he would be a bold man who would believe that perfection had been reached." In some directions there must of course be a limit, as for instance in the fleetness of any animal, and this has probably been reached with regard to the horse, but the fact remains, that most of our anciently cultivated plants still vary, and that though the peach for instance was known to Theophrastus 322 B. C., it has recently been greatly improved. At all events Darwin's idea must be the more gratifying to the husbandman, for he has a continued inducement to select and improve; whereas the belief that all things have been created as we now see them, or at the most are only suscepti-

ble of definite modification, places a sort of embargo on all future experiments. The discussion of the subject must be productive of good, and we want more such essays as that of Mr. Wier, read before the N. I. Horticultural Society, on the production of new varieties of fruits from seed.

In conclusion, the principal cause of the common unpopularity of Darwin's views, is that they do not accord with the "Law and the Prophets," — they are not Mosaic. But the columns of the P. F., are not the fit place to discuss these matters. C. V. RILEY,

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