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DARWIN ON VARIATION.

The Variation of Animals and Plants under Domestication. By CHARLES DARWIN. London: John Murray. 2 vols., 8vo. 1868.

THE SUBJECT OF VARIATION in domesticated animals is one which has, at least until a comparatively recent period, been passed over by scientific naturalists. This neglect may have arisen from one or both of two causes—ignorance of the subject, or want of appreciation of the importance of those modifications of specific forms which are perpetuated by breeders and fanciers. Mr Charles Darwin, the author of the well-known treatise "On the Origin of Species by Natural Selection," has for very many years paid great attention to this matter, as he considers the establishment of varieties by the process of long-continued artificial or human selection to be analogous to the origin of species by natural selection; and in the volumes under notice he has given us a most complete account of the amount and nature of the changes which animals and plants have undergone whilst under man's dominion. Setting aside altogether the bearing of this work on Mr Darwin's well-known hypothesis, it possesses for naturalists the highest possible interest, as being not merely the most complete, but we may say the only work which has ever been published, in which the nature and origin of varieties or distinct breeds are scientifically treated. Nor is the value of this work lessened by its being written with reference to a particular theory. Mr Darwin is known not only as one of the most accurate observers amongst living naturalists, but also as one of the most conscientious recorders of facts, stating with equal fulness and impartiality those that are opposed to, and those that are in favour of, his own conclusions. From the peculiar nature of his speculations, Mr Darwin has had many opponents; but, however much any of these may have dissented from his conclusions, all have borne testimony to the accuracy of his statement of facts, and to the great benefits he has conferred on natural science by the singular originality of his observations.

To the breeders of domesticated animals this new work of Mr Darwin possesses the highest value, inasmuch as it is an exposition of the principles on which the improvement of breeds must be founded. We propose, therefore, to give a somewhat detailed account of the most important facts brought forward by the author, who has in this work embraced the whole subject of variation under domestication, in the hope of throwing some light on its cause, and on the laws which govern it. He treats at length of the phenomena of inheritance, of the effects of crossing different breeds, and on the sterility arising from very close interbreeding. In the course of the investigation he enters fully into the inquiry of the extent of man's influence on variability, showing that he cannot cause or prevent it, and that it is only by the selection of variations and their accumulation that he is enabled to produce important results, obtaining from the same wild original such very different varieties as the dray horse and the Shetland pony, and from another the huge cochin fowl and the diminutive bantam.

In the first volume Mr Darwin treats of the variation in the different species of domestic animals, such as dogs and cats, horses and asses, cattle, sheep, rabbits, fowls, pigeons, &c., and also that which is shown in cultivated plants. The second is devoted to inheritance, causes of variability, and laws of variation, with a chapter on a provisional hypothesis, which the author has put forward in explanation of the phenomena.

In commencing the chapter on domestic dogs and cats, the author states:

> The first and chief point of interest in this chapter is, whether the numerous domesticated varieties of the dog have descended from a single wild species, or from several. Some authors believe that all have descended from the wolf, or from the jackal, or from an unknown and extinct species. Others again believe, and this of late has been the favourite tenet, that they have descended from several species, extinct and recent, more or less commingled together. We shall probably never be able to ascertain their origin with certainty.

Mr Darwin, however, inclines strongly to the belief in the mixed origin of our domestic breeds, not only from a consideration of their high antiquity, as is proved by breeds as diverse as greyhounds and turnspits being delineated on Assyrian monuments erected at dates varying from 2000 to 3000 years before the Christian era, but also from a consideration of the various races of dogs kept by savages in different parts of the world, which always more or less closely resemble the wild dogs indigenous to the country. Thus, the North American wolf and the dog of the Indians are so like that they can scarcely be distinguished, and the more northern Esquimaux dogs resemble the grey wolf of the Arctic circle, while in British Guiana the Indians often cross their dogs with a crab-eating wolf (C. cancrivorus) to improve the breed. The power of barking possessed by the domesticated breeds is obviously only an acquired habit, and, strange to say, is lost if the animals are allowed to become feral.

> The case of the wild dogs on the island of Juan Fernandez having become dumb has often been quoted, and there is reason to believe that the dumbness ensued in the course of thirty-three years. On the other hand, dogs taken from this island by Ulloa slowly recaquired the habit of barking. The Mackenzie River dogs, of the *Canis lutreus* type, when brought to England, never learned to bark properly; but one born in the Zoological Gardens "made his voice sound as loudly as any other dog of the same age and size." According to Professor Nillson, a wolf-whelp, reared by a bitch, barks. I. Geoffroy Saint-Hilaire exhibited a jackal which turned with the same tone as any common dog. An interesting account has been given by Mr G. Clarke of some dogs run wild on Juan de Nova, in the Indian Ocean: "They had entirely lost the faculty of barking; they had no inclination for the company of other dogs; nor did they acquire their voice" during a captivity of several months. On the island they "congregated in vast packs, and catch sea birds with as much address as foxes could display."

The objection sometimes made to the theory that our domesticated dogs cannot be descended from wolves and jackals, because their period of gestation is different, is shown to be without foundation, as the period is found to agree in the wolf, dog, and jackal, being often, however, variable in all three. Having reviewed the subject of the origin of the dog with great care, Mr Darwin concludes as follows:

> When we reflect on the extreme antiquity of the different breeds, and especially when we reflect on the close similarity both in external structure and habits between the domestic dogs of various countries and the wild species still inhabiting these same countries, the balance of evidence is strongly in favour of the multiple origin of our dogs.

The mode in which the different breeds of dogs have been established is fully entered into. With regard to man's power in selection it is stated:

> Nature having given variability, man, if he so choose, could fix five toes to the hinder feet of certain breeds of dogs, as certainly as to the feet of his Dorking fowls; he could probably fix, but with much more difficulty, an additional pair of molar teeth in either jaw, in the same way as he has given additional horns to certain breeds of sheep; if he wished to produce a toothless breed of dogs, having the so-called Turkish dog, with its imperfect teeth, to work on, he could probably do so, for he has succeeded in making hornless breeds of cattle and sheep.

The deterioration of certain races of dogs in India is a matter of great importance to sportsmen, and Mr Darwin brings some new facts to bear upon the question. He says:

> Dr Falconer informs me that bulldogs, which have been known, when first brought into the country, to pin down even an elephant by its trunk, not only fall off after two or three generations in pluck and ferocity, but lose the under-hung character of their lower jaws; their muzzles become finer, and their bodies lighter. English dogs imported into India are so valuable that probably due care has been taken to prevent their crossing with native dogs; so that the deterioration cannot be thus accounted for. The Rev. R. Everest informs me that he obtained a pair of setters, born in India, which perfectly resembled their Scotch parents; he raised several litters from them in Delhi, taking the most stringent precautions to prevent a cross, but he never succeeded, though this was only the second generation in India. In obtaining a single young dog like its parent in size or make; their mouths were more contracted, their noses more pointed, their size inferior, and their limbs more slender. This remarkable tendency to rapid deterioration in European dogs subjected to the climate of India, may perhaps partly be accounted for by the tendency to reversion to a primordial condition which many animals exhibit, as we shall see in a future chapter, when exposed to new conditions of life.

The manner in which man unconsciously has produced certain variations in animals is remarkably instanced by a consideration of the variable extent to which webbing of the feet exists in dogs, being much greater in Newfoundlands and otter-hounds than in terriers and the more terrestrial breeds. Mr Darwin states:

> As aquatic animals which belong to quite different orders have webbed feet, there can be no doubt that this structure would be serviceable to dogs that frequent the water. We may confidently infer that no man ever selected his water dogs by the extent to which the skin was developed between their toes; but what he does is to preserve and breed from those individuals which hunt best in the water, or best retrieve wounded game, and thus he unconsciously selects dogs with feet slightly better webbed. Man thus closely imitates Natural Selection. We have an excellent illustration of this same process in North America, where, according to Sir J. Richardson, all the wolves, foxes, and aboriginal domestic dogs have their feet broader than in the corresponding species of the Old World, and "well calculated for running on the snow." Now, in these Arctic regions, the life or death of every animal will often depend on its success in hunting over the snow when softened; and this will in part depend on the feet being broad; yet they must not be so broad as to interfere with the activity of the animal when the ground is sticky, or with its power of burrowing holes, or with other habits of life.

Domesticated cats are proved to have descended from several distinct species, and they consequently vary considerably in different parts of the world. It appears that the hybrids between almost all the smaller wild species of Felis are fertile, and the domesticated have certainly crossed with the wild individuals in many different countries. From the difficulty of pairing cats little or nothing has been done to produce varieties by artificial selection, and consequently cats show far less variation than any other thoroughly domesticated animals.

The variations of the other domesticated animals are described by the author in a similar manner to those noticed above. We propose in succeeding numbers of THE FIELD to give a *résumé* of Mr Darwin's researches as respects the remaining species, as cattle, sheep, pigs, &c.

THE BIRDS OF BERKSHIRE AND BUCKINGHAMSHIRE.

The Birds of Berkshire and Buckinghamshire: a Contribution to the Natural History of the Two Counties. By ALEXANDER CLARK KENNEDY. London: Simpkin, Marshall, and Co. 1868.

IT would perhaps be satisfactory to some reviewers to say of this little book that it was a "very creditable performance for an *Eton boy of sixteen*," both which facts are announced by the author himself; but we cannot feel contented with or justified in expressing such a grudging modicum of praise. The book, quite independently of the author's youth, is a good and useful book, and exhibits much care and thought; and, although written at an age when cricket is usually more cultivated than science, there is little to indicate immaturity of judgment or juvenility of mind.

In the first place the division of the birds observed within the geographical boundaries to which the author has confined his researches is a most excellent one. It is this: Residents, in number 64; summer visitors, 31; winter visitors, 34; spring and autumn visitors, 16; rare and occasional visitors, 80; total, 225. We are thus saved the ever-recurring sentence, "this bird is migratory with us," or "this bird is a constant resident." When a species is once placed in the group of residents, all is said on that point that is required.

As a matter of choice we should have preferred the omission of many of the species which occupy a place among "The Birds of Berkshire and Buckinghamshire." Such, for instance, are the great auk, the black swan, the black woodpecker, the Canada goose, the Carolina crake, the guillemot, the harlequin duck, the mandarin duck, the spur-winged goose, the wood grouse, and the Solan goose. We cannot help regretting the introduction of such birds, notwithstanding that the authority for each is carefully given. No authority could induce an ornithologist to suppose the great auk to be a bird of Berkshire or Buckinghamshire; and the story told of this bird is the old familiar one related by Mr Bullock, of Museum notoriety, to Dr Fleming, and recited by Mr Yarrell. Then as regards the black swans—although Mr Gurney has bred such numbers of them on his estate at Carshalton, and although one of them may have left his birthplace and strayed into Berkshire, no one by any stretch of the imagination, or by any process of reasoning, will suppose this Australian to be either naturalised in Berkshire or a voluntary visitor from the antipodes.

With regard to the great black woodpecker, we will give all the evidence Mr Clark Kennedy adduces, simply premising that he adds two more instances of the occurrence of this bird in Britain.

> In April, 1844, a great black woodpecker was seen on several successive days in the Home Park, Windsor. The observer in this case was a Mr Walter, whose word I have no reason to doubt; and, moreover, he gave so accurate a description of the bird as to leave no room for doubt that it was a veritable Picus martius. Improbable as it may appear to sceptical ornithologists, I feel farther justified in including this species in the present catalogue from my own personal observation. In March, 1867, while walking under some elms in Ditton Park, I saw a great black woodpecker busily engaged on one of the tallest trees within a short distance of me. I was sufficiently near to identify the bird with certainty, and had an opportunity of observing its movements for the space of half a minute, when it flew off with an undulating flight to a considerable distance, and was seen no more (p. 178).

The mandarin duck is introduced, on the authority of a Mr Sharpe, in the following paragraph:

> Mr Sharpe tells me that a very fine adult male mandarin duck, in splendid plumage, was shot by Mr Briggs, near Cookham, in the month of May, 1866. It might have been, and doubtless was, an escaped specimen, but it was exceedingly wild, and gave Briggs a chase which lasted nearly a whole day before he managed to shoot it (p. 208).

The statements of this kind are made in the most perfect good faith, and doubts expressed with so much candour and *naiveté*, that one cannot quarrel with the author; but the list of species would be far more valuable and more interesting to the ornithologist were such *rara aves* as great auks, mandarin ducks, and black swans altogether omitted. May we be allowed to hope that this will be the case in future editions; since their introduction actually leads to a misapprehension, for the assertion that the avifauna can boast of no less than 225 species becomes erroneous if we eliminate those which we know not to be indigenous.

As reviewers we are bound to express fairly and candidly any opinions we may entertain; but we do not urge these opinions as objections—we only mention them in the cause of science, because, were the species we have enumerated really "Birds of Berkshire," there would at once be an end to the value of all laws of geographical distribution, one of the most interesting branches of ornithology would become a dead letter, and must of necessity be abandoned.

While occupying the critic's chair we are bound also to object to the index. The words "common," "great," "little," "yellow," are perfectly useless in an index. No one ever thought, or ever will think, of looking for heron under the word "common," plover under the word "great," sea swallow under the word "little," or wren under the word "yellow;" and yet twenty-four species are arranged under the word "common," ten under the word "great," six under the word "little," and six under the word "yellow," just as though these stood in the place of such generic names as duck, goose, swan, owl, &c., &c. We are well aware that the word "common" occurs no less than thirty-eight times in Mr Yarrell's index, but there is abundant evidence that that voluminous index was never compiled by an ornithologist.

These are hints for a future edition rather than objections to the first, which we are delighted to welcome as an acceptable addition to our knowledge of the geographical distribution of British birds, and which we cordially recommend to our readers. We trust our criticisms will be sufficient evidence that our praise is no mere matter of form.

MANSFIELD PARKYNS'S LIFE IN ABYSSINIA.

Life in Abyssinia: being Notes collected during Three Years' Residence and Travels in that Country. By MANSFIELD PARKYNS. Second edition, with a new Introduction, Map, and Illustrations. London: Murray. 1868.

WHEN EVERYONE WAS TALKING about the Abyssinian exhibition, and when most people were exhibiting their intense ignorance of all pertaining to the country, no one was more frequently referred to as an authority proper to consult, and of comparatively recent date, than Mr Mansfield Parkyns. True, his journey to Abyssinia commenced in 1843, and nearly a quarter of a century has elapsed since then. But Abyssinia is not Europe, and the manners and customs of a semi-civilised or semi-barbarous people are more unvarying in their peculiarities than the changing habits of such a nation as ourselves. In point of fact, Bruce's travels, considered so incredible in their statements when they were first published, remain to the present day accurate descriptions both of country and people. Subsequent Abyssinian travellers have done little more than confirm the salient points of his narrative, adding descriptions here and there of portions of the country which he did not visit, and modernising the history.

The peculiarity of Mr Parkyns's journey consists in the fact that for the three years of his stay he lived in all respects as one of the Abyssinians themselves, mixing with the natives and learning their ways. He says he was—

> Leading the life of an Abyssinian gentleman "about town," my hair well dressed, my pantaloons always of the newest, frequently of an original cut; in dull weather setting fashions, disputing and deciding on the merits and demerits of shields and spears; in fine weather, swelling about the town with a quarter of a pound of butter melting on my head, face, neck, and clothes; and with a tail of half a dozen well got-up and equally greasy soldiers at my heels; doing the great man, with my garment well over my nose, at every festival and funeral worth attending; "hanging out" extensively when I had a few shillings to spend; spending on my neighbours when, as was oftener the case, I had nothing; in fact, living a most agreeable life on a very limited income.

It was not only town life which was known to him. As a hunter, he had much experience and great success. In describing one of his journeys, he says:

> To tantalise my English sporting readers, I will tell them what bag I brought home in little more than an hour. My first shot brought down four guinea-fowl; my second, five ditto; third, a female potoloh, fourth, her male companion; and fifth, a brace of grouse. So that, in five shots, I had as good a bag as in England one would get in an average day's shooting, and after expending half a pound of powder, and a proportionate quantity of shot, caps, and wads. But I feel it my duty to explain that *I never shot flying*, considering that unsportsmanlike. A true sportsman shows his skill by getting up to his game unperceived, when, putting the muzzle of his gun as close to the tail feathers as he possibly can, he blazes away into the thick of the covey, always choosing the direction in which he sees three or four heads peeping in a row! At any rate, this is the only way you can shoot in a country where, if you entirely expend your powder and shot, you must starve.

Mr Parkyns's book divides itself into two parts; the first describing his roving life in Abyssinia, and the second giving an account of the people, their manners, religion, government, &c. There is a very interesting chapter on the superstitions of the country, in which Mr Parkyns describes "possession by the devil," or what is believed to be such, with a vividness which half makes the reader believe "there must be something in it."

Of course Mr Parkyns occasionally suffered great discomforts, or what most English people would consider to be such. He seems, however, to have been able to find consolations under the most adverse circumstances. For instance, at a time when vetches, dried and roasted, had formed the principal part of the sustenance of himself and his servants, he says:

> I never felt lighter in my life, or more free from the many ills that vex humanity, than during this my long period of semi-starvation. Wounds of all kinds healed on me like magic, and I never knew what it was to feel lazy or fatigued.

One is inclined to say that semi-starvation in Abyssinia must be rather desirable than otherwise.

As this is the second edition of Mr Parkyns's book which has been given to the public, and as his fame as a traveller is already sufficiently well established, it is only requisite to mention the alterations which have been made in the volume. An introduction is given, which furnishes a brief account of the general geography of Abyssinia, states some facts about King Theodore, and makes certain remarks with regard to the Abyssinian expedition. Some portions of the first edition, which did not directly bear on Abyssinia, are omitted from this volume.

We know of no book of travel more thoroughly interesting than this. It is clear, simple, straightforward, and unpretentious, and carries the reader on without sense of weariness. Mr Murray has done well to give us at the present crisis a new edition of a work of so much interest.

The book is illustrated by woodcuts and by a map, which shows not only Mr Parkyns's route, but those of some other of the principal Abyssinian travellers.

TREATMENT OF DAIRY STOCK.

The Treatment of Stock in the Dairy Districts of Shropshire and Cheshire. Wolverhampton: George Griffith, 24, Queen-street.

THIS was the subject of a lecture lately delivered before the Severn Valley Farmers' Club by J. Bailey Denton. The lecturer considered his subject under two heads, viz., the treatment of dairy stock in the field, and at the homestead. The folly of poaching during winter; the cold wet pastures (generally on the new red sandstone formation); the condition of such in spring; the land near and about the gates looking like mud; the deep tracks all over the fields; the retention in these impressions of water long after it has been absorbed on the untrodden land—are all proofs of the injury that must result from keeping young stock out day and night through winter, and turning the dairy cows out during the day. Not only as regards the pastures, but as affecting the health of the cows, is the ordinary treatment most unfortunate. When animals tied up in a hot, crowded, low-roofed shed during night, are turned out during days regardless of weather, to stand with backs up and staring coats on the lee side of a hedge, such violent changes must surely predispose to disease; the seeds of consumption, inflammation of bowels or lungs, are sown in such a soil with a lively prospect of rapid growth; and, when any epidemic does appear, what chance has the already weakened system of fighting it out? Was not the fearful visitation of cattle plague the inevitable corollary of such mismanagement? Is it not well known that pleuro-pneumonia has been especially destructive in Cheshire? We are the last to advocate a system which pampers the animal, and therefore do not altogether coincide with Mr Denton as to covered yards, although the economy of litter is a very strong point when the proportion of arable land is so small; but now that drainage has become more general—now that the application of bones has greatly increased the value of the produce—now that broad-breasted bulls have fathered a more thriving class of stock—may it not be desirable, nay, almost necessary, to increase the proportion under plough, and thus, with more roots and straw, make a better provision for winter food? Granted that we can satisfactorily manage this question of litter, we should prefer warm sheltered yards facing south, with ample shed room open to the eaves; the sheds to be carefully spouted, the mangers under cover, and the animals fed from a gangway, cows being tied up for milking if required. Mr Denton gives a graphic description of the shippon or cowhouse—dark, damp, low, with the loft floor just above the animals' heads; the loft full of compressed hay, which is rendered mouldy and unwholesome by the fetid breath that passes upwards. Absence of ventilation, and the violent changes already noticed, are all fruitful causes of disease affecting the breathing apparatus. In advocating the covered yard, Mr Denton alludes to the fact that in the Eastern counties, where the rainfall is more moderate and therefore less injurious to the manure, and where straw is so abundant that its consumption is often a difficulty, covered yards are on the increase, whereas in the West they do not make way at all; and he seems unable to offer an explanation for this apparent anomaly. We venture to give one. The West is essentially a breeding country; the large proportion of pasture renders it the nursery for producing the supply that is to feed the eastern side of our island, where the absence of pasture prevents to a great extent the keeping a large breeding stock. Young animals thrive better, take the year round, when wintered in open than in covered yards, because they are not subject to violent change or contrast, and because exposure to atmospheric influences, such as rain and wind, are very beneficial. Who that has studied cattle has not noticed the contented way in which stock will stand exposed to rain, disdaining the comfortable shed; and, lastly, what grazier but will rue after the rough long coats of the winter-fed stock, and give more for them than for the fresher, smoother, and rather delicate-looking habitués of the covered yard? These are facts of great importance in the West, but not felt in the Eastern districts, where feeding is the principal business. Nothing can be better in such cases; the manure is perfect, the beasts thrive fast, and the return may justify the outlay. Various statements are made to prove the superior nature of manure made under cover to that in open yards; this must be so, since the proportion of fæcal matter is greater; but no experiments yet carried out have proved that manure carefully made in well-spouted yards is, according to proportion of fæces and straw, less valuable than that under cover. It may be so to some extent, but not certainly in the proportion the advocates for covered yards would have us believe. We heartily agree with Mr Bailey Denton in the contrast he draws between cattle in covered yards and starving in the fields. Surely Cheshire landlords should see what can be done in the matter. Draining and bones will only be a partial work, if the wretched system inseparable from the present buildings is to go on. It is a duty they owe not only to their successors, but to the State, to increase the productive powers of their properties; and there is great room for progress in Cheshire.

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