

## DARWIN'S VOYAGE OF A NATURALIST,

*Or a Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H. M. S. BEAGLE round the World, under the command of Capt. FITZ ROY, R. N., by C. DARWIN, M. A., R. R. S., in 2 vols. 12mo. Harper & Brothers, N. Y. 1846.*

We have no intention to write at this time a criticism of this work. Our design in noticing the Journal of Researches is the more humble one, that of recommending the work to the public, as one of the most interesting and instructive books of the kind which has been published for many years. In the form in which it is presented to the public, it is admirably adapted to the purpose of popular instruction and entertainment, and is especially worthy of a place in all the school libraries of our country. It will be found full of interesting matter in all the departments of natural history; indeed it would seem from the range of observation which Mr. Darwin takes, that he is an accomplished and finished naturalist in all the several classes of investigation into which this field of knowledge is now divided. We cannot add to Mr. Darwin's reputation or fame by any remarks which we can make; we shall content ourselves with the above recommendation of his researches, and proceed at once to make some extracts from them which have a bearing upon the objects which this Journal is designed especially to promote. We shall first take up Mr. Darwin at the Banda Oriental with his host on an estate at Arroyo de San Juan. We give a few passages from the Journal here, as it will convey a better idea of South American farming and husbandry than any labored description which we can give, and in connection we shall introduce his account of a singular breed of cattle which came under Mr. D.'s observation at this place.

18th.—Rode with my host to his estancia at the Arroyo de San Juan. In the evening we took a ride round the estate: it contained two square leagues and a half, and was situated in what

is called a rincon; that is, one side was fronted by the Plata, and the two others guarded by impassable brooks. There was an excellent port for little vessels, and an abundance of small wood, which is valuable as supplying fuel to Buenos Ayres. I was curious to know the value of so complete an estancia. Of cattle there were 3000, and it would well support three or four times the number; of mares 800, together with 150 broken-in horses, and 600 sheep. There was plenty of water and limestone, a rough house, excellent corrals, and a peach orchard. For all this he had been offered £2000, and he only wanted £500 additional, and probably would sell it for less. The chief trouble with an estancia is driving the cattle twice a week to a central spot, in order to make them tame, and to count them. This latter operation would be thought difficult, where there are ten or fifteen thousand head together. It is managed on the principle that the cattle invariably divide themselves into little troops of from forty to one hundred. Each troop is recognised by a few peculiarly marked animals, and its number is known: so that, one being lost out of ten thousand, it is perceived by its absence from one of the tropillas. During a stormy night the cattle all mingle together, but the next morning the tropillas separate as before, so that each animal must know its fellow out of ten thousand others.

On two occasions I met with in this province some oxen of a very curious breed, called nata or niata. They appear externally to hold nearly the same relation to other cattle which bull or pug dogs do to other dogs. Their forehead is very short and broad, with the nasal end turned up, and the upper lip much drawn back; their lower jaws project beyond the upper, and have a corresponding upward curve: hence their teeth are always exposed. Their nostrils are seated high up and are very open; their eyes project outwards. When walking they carry their heads low, on a short neck; and their hinder legs are rather longer, compared with the front legs, than is usual. Their bare teeth, their short heads, and upturned nostrils give them the most ludicrous, self-confident air of defiance imaginable.

Since my return I have procured a skeleton head, through the kindness of my friend, Captain Sullivan, R. N., which is now deposited in the College of Surgeons.\* Don F. Muniz, of Luxan, has kindly collected for me all the information which he could respecting this breed. From his account, it seems that about eighty or ninety years ago they were rare, and kept as curiosities at Buenos Ayres. The breed is universally believed to have originated amongst the Indians southward of the Plata, and that it was with them the commonest kind. Even to this day, those

\* Mr. Waterhouse has drawn up a detailed description of this head, which in due time he will publish in some Journal.

reared in the provinces near the Plata show their less civilized origin, in being fiercer than common cattle, and in the cow easily deserting her first calf, if visited too often or molested. It is a singular fact, that an almost similar structure to the abnormal\* one of the niata breed characterizes, as I am informed by Dr. Falconer, that great extinct ruminant of India, the Sivatherium. The breed is very *true*; and a niata bull and cow invariably produce niata calves. A niata bull with a common cow, or the reverse cross, produces offspring having an intermediate character, but with the niata characters strongly displayed: according to Senor Muniz, there is the clearest evidence, contrary to the common belief of agriculturists in analogous cases, that the niata cow when crossed with a common bull, transmits her peculiarities more strongly than the niata bull when crossed with a common cow. When the pasture is tolerably long, the niata cattle feed with the tongue and palate as well as common cattle; but during the great droughts, when so many animals perish, the niata breed is under a great disadvantage, and would be exterminated if not attended to; for the common cattle, like horses, are able just to keep alive by browsing with their lips on twigs of trees and reeds; this the niatas cannot so well do, as their lips do not join, and hence they are found to perish before the common cattle. This strikes me as a good illustration of how little we are able to judge from the ordinary habits of life, on what circumstances, occurring only at long intervals, the rarity or extinction of a species may be determined.

Farmers of this and the New England States have complained of the Canada thistle, and have felt that it is so much of a nuisance as to call for legislative enactments for its extirpation. Let us see what kind of thistles Mr. Darwin saw on the fertile pampas near Mercedes on the Rio Negro:—

21st.—Started at sunrise, and rode slowly during the whole day. The geological nature of this part of the province was different from the rest, and closely resembled that of the Pampas. In consequence, there were immense beds of the thistle, as well as of the cardoon: the whole country, indeed, may be called one great bed of these plants. The two sorts grow separately, each plant in company with its own kind. The cardoon is as high as a horse's back, but the Pampas thistle is often higher than the crown of the rider's head. To leave the road for a yard is out of

\* A nearly similar abnormal, but I do not know whether hereditary, structure has been observed in the carp, and likewise in the crocodile of the Ganges: *Histoire des Anomalies*, par M. Isid. Geoffroy St. Hilaire, tom. i., p. 244.

the question; and the road itself is partly, and in some cases entirely closed. Pasture, of course, there is none; if cattle or horses once enter the bed, they are for the time completely lost. Hence it is very hazardous to attempt to drive cattle at this season of the year; for when jaded enough to face the thistles, they rush among them and are seen no more. In these districts there are very few estancias, and these few are situated in the neighborhood of damp valleys, where, fortunately, neither of these overwhelming plants can exist. As night came on before we arrived at our journey's end, we slept at a miserable little hovel inhabited by the poorest people. The extreme though rather formal courtesy of our host and hostess, considering their grade of life, was quite delightful.

Another subject which our friends, the wool-growers, will be interested in is Mr. D.'s description of the South American shepherd dogs; and we would suggest whether the same plan might not be adopted here for breaking in our common dogs to the business of yarding sheep. Certainly the plan appears to us perfectly feasible.

While staying at this estancia, I was amused with what I saw and heard of the shepherd-dogs of the country.\* When riding, it is a common thing to meet a large flock of sheep guarded by one or two dogs, at the distance of some miles from any house or man. I often wondered how so firm a friendship had been established. The method of education consists in separating the puppy, while very young, from the bitch, and in accustoming it to its future companions. A ewe is held three or four times a day for the little thing to suck, and a nest of wool is made for it in the sheep-pen; at no time is it allowed to associate with other dogs, or with the children of the family. The puppy is, moreover, generally castrated; so that, when grown up, it can scarcely have any feelings in common with the rest of its kind. From this education, it has no wish to leave the flock, and just as another dog will defend its master, man, so will these the sheep. It is amusing to observe, when approaching a flock, how the dog immediately advances barking, and the sheep all close in his rear, as if round the oldest ram. These dogs are easily taught to bring home the flock at a certain hour in the evening. Their most troublesome fault, when young, is their desire of playing with the sheep; for in their sport they sometimes gallop their poor subjects most unmercifully.

\* M. A. D'Orbigny has given nearly a similar account of these dogs, tom. i., p. 175.

The shepherd-dog comes to the house every day for some meat, and as soon as it is given him he skulks away as if ashamed of himself. On these occasions the house-dogs are very tyrannical, and the least of them will attack and pursue the stranger. The minute, however, the latter has reached the flock, he turns round and begins to bark, and then all the house-dogs take very quickly to their heels. In a similar manner, a whole pack of the hungry wild dogs will scarcely ever (and I was told by some never) venture to attack a flock guarded by even one of these faithful shepherds. The whole account appears to me a curious instance of the pliability of the affections in the dog; and yet, whether wild or however educated, he has a feeling of respect or fear for those who are fulfilling their instinct of association; for we can understand on no principle the wild dogs being driven away by the single one with its flock, except that they consider, from some confused notion, that the one thus associated gains power, as if in company with its own kind. F. Cuvier has observed, that all animals that readily enter into domestication, consider man as a member of their own society, and thus fulfil their instinct of association. In the above case the shepherd-dog ranks the sheep as its fellow-brethren, and thus gains confidence; and the wild dogs, though knowing that the individual sheep are not dogs, but are good to eat, yet partly consent to this view when seeing them in a flock with a shepherd-dog at their head.

To us no subject of enquiry has been so interesting as the process by which our domestic animals have been subdued and domesticated; and hence every fact which bears upon this subject, directly or indirectly, we esteem of great importance. It is a broad field of inquiry, and we have no time now to enter upon a consideration of the facts even in a general manner; we, however, take the opportunity to extract one more interesting passage from Mr. D.'s book, which bears upon this subject, and which contains, aside from its bearing, curious matter of fact for the consideration of naturalists, in regard to the changes which species undergo under the special influence of local circumstances. The observations are upon the cattle which have become wild in the Falkland Islands. They were introduced here by the French in 1764, since which time they have greatly increased. Mr. D. remarks:—

It is a curious fact that the horses have never left the eastern end of the island, although there is no natural boundary to pre-

vent them from roaming, and that part of the island is not more tempting than the rest. The Gauchos whom I asked, were unable to account for it, except from the strong attachment which horses have to any locality to which they are accustomed. Considering that the island does not appear fully stocked, and that there are no beasts of prey, I was particularly curious to know what has checked their originally rapid increase. That in a limited island some check would sooner or later supervene, is inevitable; but why has the increase of the horse been checked sooner than that of the cattle? Capt. Sullivan has taken much pains for me in this inquiry. The Gauchos employed here attribute it chiefly to the stallions constantly roaming from place to place, and compelling the mares to accompany them, whether or not the young foals are able to follow. One Gaucho told Capt. Sullivan that he had watched a stallion for a whole hour, violently kicking and biting a mare till he forced her to leave her foal to its fate. Capt. Sullivan can so far corroborate this curious account, that he has several times found young foals dead, whereas he has never found a dead calf. Moreover, the dead bodies of full-grown horses are more frequently found, as if more subject to disease or accidents than those of the cattle. From the softness of the ground their hoofs often grow irregularly to a great length, and this causes lameness. The predominant colors are roan and iron-grey. All the horses bred here, both tame and wild, are rather small-sized, though generally in good condition; and they have lost so much strength that they are unfit to be used in taking wild cattle with the lasso: in consequence, it is necessary to go to the great expense of importing fresh horses from the Plata. At some future period the southern hemisphere probably will have its breed of Falkland ponies, as the northern has its Shetland breed.

The cattle, instead of having degenerated like the horses, seem, as before remarked, to have increased in size; and they are much more numerous than the horses. Capt. Sullivan informs me that they vary much less in the general form of their bodies and in the shape of their horns than English cattle. In color they differ much; and it is a remarkable circumstance, that in different parts of this one small island different colors predominate. Round Mount Osborne, at a height of from 1000 to 1500 feet above the sea, about half of some of the herds are mouse or lead-colored, a tint which is not common in other parts of the island. Near Port Pleasant dark brown prevails, whereas south of Choiseul Sound (which almost divides the island into two parts) white beasts with black heads and feet are the most common: in all parts black and some spotted animals may be observed. Capt. Sullivan remarks, that the difference in prevailing colors was so obvious, that, in

looking for the herds near Port Pleasant, they appeared from a long distance like black spots, whilst south of Choiseul Sound they appeared like white spots on the hill-sides. Capt. Sullivan thinks that the herds do not mingle; and it is a singular fact that the mouse-colored cattle, though living on the high land, calve about a month earlier in the season than the other colored beasts on the lower land. It is interesting thus to find the once domesticated cattle breaking into three colors, of which some one color would in all probability ultimately prevail over the others, if the herds were left undisturbed for the next several centuries.

The few extracts which we have made will convey some idea of Mr. D.'s mode of treating the subject which came under his observation, and we cannot do less than recommend the work to our readers as one abounding in curious and valuable facts; those which are not only practical, but also suited to convey to us reliable information in regard to the state and condition of the Republic of South America, and the peculiar habits and condition of its inhabitants.

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## A TEXT BOOK ON AGRICULTURE.

BY N. S. DAVIS, M. D., BINGHAMTON, N. Y.

This is a duodecimo volume of 126 closely printed pages, and as its name imports, is a strictly elementary work. The first twenty pages are occupied with a brief account of the imponderable bodies or agents which produce changes in matter; together with the laws that govern chemical combinations, the nomenclature or system of naming, and the general classification of all elementary substances—then follows a short account of each elementary body that enters into the composition of soils and vegetables. The next two chapters treat of the formation, composition and classification of soils, and the composition of vegetables. Then come twenty pages devoted to a consideration of “the means possessed by man for fertilizing the soil, and rendering it fit for the cultivation of any crop that he may desire,” including the preparation and application of manures. The chapter on the latter subject closes with the following very just summary of the objects to be accomplished, viz :