
Inquiries respecting certain Changes observed to have taken place in Domestic Animals transported from the old to the new Continent. By M. ROULEN, M. D. Abridged from the more full details contained in the Edinburgh New Philosophical Journal for October, 1829, p. 326, &c.

DR. ROULEN, after a residence of six years in Columbia, states, that of the large quadrupeds which at present occur in that country, the most numerous are those which have been transported from the old continent. His observations were made

in New Grenada and in a part of Venezeula, between the 3rd and 10th degrees of north latitude, and the 70th and 80th degrees of west longitude, where, in some parts, there was a mean temperature of 56, and in others of 77 or 86. The quadrupeds which have been transported from the old to the new continent, he observes, "are the hog, the horse, the ass, the sheep, the goat, the cow, the dog, and the cat." The first hogs were carried to America by Columbus, and established in the island of St. Domingo, in November, 1493, and in succeeding years were carried to all places where the Spaniards settled, so that in half a century they were found in the new world between 25 N. and 4 S. latitude. They nowhere seemed to suffer from the change of climate, and from the commencement propagated with the same facility as in Europe.

Being allowed to run wild in the woods, they have lost all the marks of servitude; the ears have become erect, the head broadened, and raised at the upper part, and the color has become a permanent black in the adults,—in the young, there are yellowish lines on a dark ground. The hair is thin, and they present the appearance of a wild boar of the same size, (from twelve to fifteen months,) while in the mountains, at an elevation of 2500 yards, they assume much of the aspect of the wild boar of our forests, from the thickness of the hair, which becomes curled, and in some individuals (even presents a kind of wool on the under parts. The hog, at the elevation mentioned, is small and dwarfish, from cold and want of sufficient food. Though black be the general color, yet, in some warm parts, it is red, like the pecari in its early age, and there are some which are called *chiuchados*, from their having under the belly a broad white band, which commonly extends on either side to the back, so as to meet there, sometimes becoming narrower and sometimes retaining the same breadth. The young individuals of this variety, have the same markings, as those which are entirely black. The only hogs resembling those of France, were imported about twenty years ago, from the United States of America, where the race had existed for a long time, in a climate, however, very like that of France.

The establishment of black cattle in America, took place upon Columbus's second voyage to St. Domingo. They multiplied there rapidly, and from thence were carried to the continent. In twenty-seven years from the discovery of the island, herds were met with of 4000 and even 8000 head. In 1587, the number of hides exported from St. Domingo, were 35,454; and from the parts of New Spain, 64,350. "As long as the cattle were in small numbers, and grouped around the dwellings, they thrived equally well in all places, but when they had multiplied, it was perceived, that, in certain

places, they could not dispense with the assistance of man. This arose from the circumstance that a certain quantity of salt in their food was absolutely necessary for them; and if they did not find it in the plants, the waters, or in certain soils of a saltish taste, common to many parts of America, they required to be supplied with it directly, failing which they became lean, and the herd quickly perished. If it be neglected to bring the cattle together, from time to time, and the requisite salts be supplied by the country, they become entirely wild in a few years, which the writer knew to happen in two instances. He never had an opportunity of seeing a wild specimen alive, but he eat of the flesh of a cow that had only been killed one day, and perceived no difference between it and the domestic cow. The skin was remarkably thick, but of the ordinary size, and the hair long, thick, and ill laid. He has seen the wild bulls that pass the morning in the woods which cover the foot of the Cordillera, and the afternoons in the Savanna, feeding in the *ilanos* amongst the domestic cattle, but, the moment they perceived a man, they galloped off into the woods. Cattle with hair extremely thin and fine, are met with in the warmest parts of the province of Mariguita and Negla, and are called *pelones*. That variety is reproduced by generation, but the people are not desirous of propagating it. In the same places, there are also frequently produced, individuals named *calungos*, whose skin is entirely naked, like that of the Turkish dogs. These animals being weaker and more delicate, it is usual to kill them before they are capable of propagating. The cows of America will not give milk without they have their calves, which must be left all day with them, and allowed to suck as they please. They are only separated in the evening, that the milk which collects through the night may be procured. If the calves die, the milk immediately ceases to be secreted.

The ass, in the provinces in which Dr. Roulin had an opportunity of observing it, appeared to have undergone scarcely any alteration in its forms or habits. From hardships and deprivations, it is of small size, and covered with a very long and ill-combed pile. Deformities are frequent, not only in the adults, which are too soon put to labour, but even in the young at the moment of birth. In the lower and warmer parts, it is better fed, and larger, and its hair shorter and smoother. In none of the provinces which he visited, had the ass returned to the wild state.

The case is different with the horse. There are wild horses in several parts of Columbia; and the author saw small herds in the plains of St. Martin, between the sources of the Meta, Rio-Negro, and the Umadea; and he observed, that whenever they perceived a man they never stopped till out of

sight. Where they are only now and then assembled for to prevent their becoming entirely wild, as well as for the purpose of ridding them of the larvæ of the Oestri, and of marking the foals with a hot iron, as is the case in the halos of the ilanos, the color becomes uniform chesnut. In the small halos that occur on the platforms of the Cordillera, the effects of domestication are more perceptible; the colors of the horses are there more varied: there is there more difference in their size, that is to say, there are many among them smaller, and some a little larger; their hair, so long as they live in the fields, is pretty long and tufted, but a few months rubbing is sufficient to render it short and glossy. When a horse is brought from the ilanos of San Martin, or Casauare, to the platforms of Bogota, it must be kept in the stable until it becomes habituated to the climate, for if let loose at first, into the fields, it falls off, is covered with scabs, and often dies in a few months. The pace which is preferred in saddle horses, is the amble and *le pas relevé*. They are trained to them at an early age, and when ridden are carefully prevented from using any other pace. At the end of a certain time, the legs of these commonly *s'engorgent*; then, if they are of a fine form, they are kept in the hatos as stallions. There results from this, a race in which the amble is the natural pace in the adult.

Dogs were introduced and employed by Columbus, in his wars with the natives, and in his first battle with the Indians, he had twenty blood-hounds. Their race has been preserved without apparent alteration, on the platform of Santa Fe, where they are employed for hunting deer. Amongst the poor inhabitants of the banks of the Magdalena, the dog has become deteriorated, partly by mixture and partly by the want of sufficient food.

The cat has undergone no perceptible change in America, excepting that it has ceased to have any more particular season of love in the year than another.

The sheep which was carried from Spain, is not of the Merino breed, but of the kind called *de lana burda y Cuatra*. It is very common on the Cordillera, from the height of 1000 m. to 25,000 m. It nowhere endeavours to escape from the protection of man, nor has any change taken place in its manners; the only difference exhibited by it, being a slight diminution of size. Within the limits stated, it propagates easily, but in warmer countries, as in the plains of Meta, it is difficult to rear. In the valley which separates the eastern from the middle chain of the Cordillaras, there are some seen, in a few places, but always in small numbers, the females being unprolific, and the lambs difficult to bring up. The wool on these lambs grows much in the same manner as on those of

temperate climates. If after attaining a certain thickness, it is cut, it immediately begins to sprout again, and things go on in the usual order; but if the proper time for depriving the animal of its fleece is allowed to pass, the wool thickens and becomes matted, and ends with coming off in patches, which leave under them not a new wool, nor a bare skin in a diseased state, but a short, shining and well-laid hair, very similar to that which the goats assume in the same climates. In the places where this hair has once appeared, no wool ever grows.

The goat thrives better in the low and burning valleys than in the elevated parts of the Cordillera. In the climates which agree with it, it multiplies well, there being commonly two, sometimes three kids, at each birth; but never six as some have chosen to assert. Its size is small, but in form it has gained much: its body is more slender, its head more elegant, better placed, and generally less loaded with horns.

The domestic fowls that have been carried to the West Indies, are, the common fowl, the goose, the duck, the peacock, the pigeon, and the Guinea fowl.

The two last have undergone no change. The peacock is absolutely the same as in France. The goose has been introduced about twenty years; at first it laid but a small number of eggs, and at long intervals, and scarcely the fourth part were hatched; of the goslings, more than half died in the first month. Those who escaped, formed a second generation which had become more familiarized to the climate; and at the present day, the species, without being as yet so prolific as in Europe, is evidently approaching to the same point.

With respect to the common fowl, the same thing happened at Cuzco, and in its whole valley, as Saralasso informs us; and more than thirty years passed before chickens were obtained, although At-y-Ucai and Muyna, only four leagues from the town, they were procured in abundance. At the present day, the race introduced is every where prolific; but the English breed which has been imported within these few years, for the purpose of obtaining game cocks, has not yet arrived at this degree of fecundity; and in the first year, the proprietor of a flock thought himself fortunate if he obtained two or three chickens from the whole. When the chickens of either race are observed, in the warm districts, curious differences are remarked in them. The creole chicken, whose parents have lived for ages in a temperature which never descends below 20°, comes from the egg with a small quantity of down, which it presently loses, and remains completely bare, with the exception of the wing feathers, which grow in the ordinary way. The chicken of the English breed, on the contrary, makes its appearance with a thick covering of down,

which falls off only as the feathers take its place. It is still clothed as if intended to live in the country whence its parents have been but lately brought.

The facts above related, adds the Doctor, were observed without the preconceived idea of attaching them to any theory; but, on examining them, one is naturally led, he thinks, to the following inferences:

1st. That, when certain animals are transported to a new climate, it is not the individual only, but the races, that require to be naturalized.

2ndly. That when this naturalization takes place, there are commonly introduced in these races, certain durable changes, which bring their organization to a state of accordance with the climates in which they are destined to live.

3rdly. That the habits of independence soon make the domesticated species resume the characters of the wild species from which they have sprung.

*On the Relations of the Tertiary and Secondary Rocks forming the Southern Flanks of the Tyrolese Alps near Bassano.** By RODERICK IMPEY MURCHISON, F.R.S. Sec. G.S. F.L.S. &c. &c.

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THAT various members of the secondary deposits replete with marine remains are found in dislocated positions in some of the highest regions of the Alps, was long ago noticed by De Saussure; and the fact has since been confirmed by many other geologists. The inference derived therefrom, that such remnants can alone have been placed at these heights by elevation from beneath the sea, is now considered by the greater number of observers to be the only philosophical mode of explaining the phænomenon. The object of this memoir is to determine whether the same causes of elevation were applied at a subsequent period to those newer or tertiary deposits which now form a belt around the flanks of the Alps. The solution of this question is called for, because the evidence on this point has hitherto remained so imperfect, that several

* As the interesting communication of Dr. Thom, published in our present number, gives reason to believe, that much curious information will be furnished by a thorough investigation of the Geology of South Africa, we beg, therefore, to recommend to the colonists the collecting of all sorts of rocks or stones bearing any kind of natural impressions or figures, however trifling. In order to shew the character of some formations constituting the flanks of a high mountainous range in Europe, and of the organic remains found in them, we have here reprinted the remarks of Mr. Murchison.—ED.