

On the Origin and Natural History of the Ox and its allied Species. By JAMES WILSON, Esq. F. R. S. &c.

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THE domestication of the dog demonstrates the power of the human race over even a strictly carnivorous animal—and the subjugation of the common cat is another equally familiar example, which might have reminded the great French naturalist that it was not the ruminating and herbivorous animals alone which had become subservient to the will of man. The last named quadruped (and, among birds, domestic poultry illustrate the same point,) also proves, that man in some instances has subdued not the individuals alone, but the entire species—for it is known that there are several of our domestic animals, of which the personal researches of travellers, and the learning and ingenuity of naturalists, however assiduously exerted, have as yet sought in vain to discover the original sources. From this we cannot positively infer that they are extinct, but we may fairly infer, that if they exist at all they must occupy some remote and unknown corner of the earth, and be very uninfluential compared with the greatly preponderating mass of individuals which now dwell under the fostering care of man, and may be said really to constitute the species.

Buffon appears to have admitted of only two kinds of cattle, the bull and the buffalo. A wild bull, the source of all our domestic breeds, synonymous with the Aurochs of Europe, with the Bison of America, and the Zebu of Africa, and of Asia, were all regarded by him as varieties of one and the same species, produced by climate, food, and domestication. The humped backs of the Bison and Zebu, according to the imaginative views of the eloquent Frenchman, were signs of slavery produced by grossness and excess of feeding, and he sought to escape the dilemma presented by the existence of wild cattle with humped backs, by at once asserting, that these were either an emancipated tribe, originally descended from an enslaved and deteriorated race, or constituted in themselves a natural variety of which the hump was characteristic. According to the same authority, it was a humped variety, which, passing from the north of Europe or Asia, to the American Continent, gave rise to the Bison breed of that country,—a theory which he thinks strongly confirmed by the fact, that both the Aurochs of the Old World, and its representative in the new, smell strongly of musk! So confused were his notions in many respects concerning these

animals, that he appears to have confounded the Bison and the musk-ox, although Charlevoix, and other travellers to whom he had access, had previously described the difference in their external characters, as well as in their haunts and habits. In regard to their geographical distribution, he advances the dwelling-places of the Bison almost to the Pole itself, whereas, in reality, the musk-ox only is found there; and then forgetting what he had just before stated, he locates the race of Aurochs in the frigid zone, and restricts the Bison to the temperate; while he draws the general conclusion, that all domestic cattle without humps are descended from the former, and all humped cattle from the latter.

Pallas, in the 2nd volume of the Petersburg Transactions (*Act. Petrop.*), enters into a detailed statement of facts regarding the natural history of the aurochs, the bison, the musk-ox, and the yacks, or grunting-ox of Pennant and Dr. Shaw,—thus admitting, in the first place, the existence of four distinct species. In this enumeration he errs, in so far as he confounds the European and American bisons as one and the same. He refutes the mistake committed by Buffon in supposing that the aurochs of Europe consisted of two varieties, the urus and the bison. The last named author was probably drawn into error by following the sentiments of some ancient writers, for example Pliny, and by the old German word *bisem*, signifying the musky odour of the aurochs, and no doubt latinized in the term *bison*. But while Pallas freely admitted that neither the aurochs nor the bison existed throughout the whole extent of Northern or Middle Asia, he nevertheless persisted with Buffon, that the aurochs and the true American species were identical, and were merely altered in their respective localities, by the difference of climatic influences. He asserts the probability of their having passed from Europe to America, when these continents were connected by vast and continuous tracts of land, of which the shattered and sunken debris are still represented by the snow-covered mountains of Iceland, and the isles of Shetland and Feroc. He regards the aurochs as the real and original source of our domestic breeds of cattle. The result of his inquiries indicates, that according to his views our domestic cattle and the aurochs and bison are the same, while the musk-ox, the grunting-ox (yacks), and the Asiatic and African buffaloes, are distinct from those just mentioned, and from each other.

It appears that, antecedent to the time of Cuvier, the larger kinds of horned cattle were considered as amounting to five in number, so far as regarded living species. In the *Dictionnaire des Sciences Naturelles*, Cuvier distinguishes eight of them. He separates the aurochs from the bison, and establishes two additional species, the *arnée* of Asia, and the domestic bull, the source of which he traces, not to the aurochs, of which the

number of the ribs, the occipital arch, and the inter-orbital distances of the forehead, are dissimilar, but to a fossil species (probably extinct in the living state), the bones of which occur in various alluvial soils of Europe, and of which the dimensions equal those of the great fossil buffalo discovered by Pallas in Siberia. No species of cattle has ever been found in a truly wild condition in any part of South America. Neither have their remains occurred on that continent, even in a fossil state. In North America, on the contrary, on this side of the Tropic of Cancer, two species occur,—the bison or buffalo of the Anglo Americans, and the musk-ox (of the Arctic Regions) which recent systematic writers have formed into a separate genus, under the name of *ovibos*. The distinguishing characters of the American bison consist of its possessing fifteen pair of ribs, and being comparatively much feebler in the hinder than the anterior extremities—characters of more essential importance in the distinction of species, than the size and direction of the horns, or the texture and colour of the external coat. As far, however, as the nature of the hair is concerned, there exists a decided difference between the aborigines of the New World, and the species of Europe and Asia, viz. the coat of the former is woolly, and their hides, like those of the musk-ox, are of a more spongy nature than those of the aurochs and European oxen. The American bison appears to inhabit from about the 40th degree of north latitude to the vicinity of the polar circle, beyond which its place is occupied by the musk oxen (*B. moschatus*).

The northern provinces of Asia produce neither the aurochs, the buffalo, nor the bison, nor is there any proof that they ever existed in these territories; for the fossil skulls which are found there seem to belong to an extinct species, which, in former times, inhabited both Europe and Asia. Its remains are found with those of the fossil elephant and rhinoceros, from which it may be inferred to have been not contemporaneous with the other species, for, had it been otherwise, their bones would have been found together. The skulls analogous, but so superior in size, to those of our domestic breed, are, on the contrary, contemporaneous with the actual conditions of animal life, for they occur in soils or superficial strata, the formation of which is going on at the present time.

As some of the readers of this Journal may not be sufficiently acquainted with the subjects of Natural History to admit of their forming any very precise ideas in connexion with the terms or specific appellations which we make use of, we shall, before proceeding further, present an abridged view of the synonyms, characters, and localities, of the principal species of the genus *Bos*, chiefly in accordance with the latest arrangement with which we are acquainted—that of Baron

Cuvier, as exhibited in the recent edition of the *Regne Animal* (1829):

2.—THE DOMESTIC BULL AND COW.

(*Bos Taurus*, PLINY, GESNER, ALDROVANDUS. *Bos Taurus, domesticus*, LINNÆUS, &c.)

The most permanent and substantial specific characters of this animal may be stated as follows:—Forehead flat, longer than broad, horns round, placed at the two extremities of a projecting line, which separates the front from the occiput. Ribs amounting to thirteen pair. Teats disposed in the form of a square. Hair of the anterior parts of the body not more bushy than that of the other parts. The supposed original of this animal (the *urus* of the ancients) is most probably extinct in the living state. In the fossils skulls which appear to represent it, the horns are curved forwards and downwards, but in the countless varieties of the domestic breed, these parts are very different in their forms and direction, and are sometimes wanting altogether. The ordinary races of the torrid zone are generally distinguished by a hump or large excrescence of fat and flesh upon the shoulders. The species does not occur naturally in either North or South America.

2.—THE AUROCHS OF THE GERMANS.

(Called *Zubr* in Poland. *Bos Urus* of GMELIN. The Bison of the ancients. The European Bison of SHAW, *Gen. Zool.* pl. 205. *Bos Taurus*, var. *Urus*, LINN.—*Bœuf Aurochs*, DESMAREST.)

This species has been frequently, though erroneously, regarded as the origin of our domestic cattle. It is distinguished by its bulged or convex forehead, which is, moreover, broader than high, by the peculiar attachment of the horns *below* the line of the occipital ridge, by an additional pair of ribs (fourteen), by a sort of frizzled wool, which covers the head and neck of the male, and forms, as it were, a beard or small mane upon the throat, and by a peculiarity in the tone and utterance of its voice, which, to use the convenient language of the novelist, is “more easily imagined than described.” This is a wild and independent animal, which is now confined to the marshy forests of Lithuania, of Carpathia, and the Caucasus, but formerly inhabited the temperate parts of Europe. It is the largest of all the quadrupeds native to Europe, and measures six feet in height at the shoulder, and betwixt ten and eleven feet in length, from the nose to the insertion of the tail. According to Gilibert, it surpasses the dimensions of the largest of the Hungarian bulls. The length of the mane in the female is not more than the fourth part of that of the male. In both sexes, the lips, gums, palate, and tongue, are blue, and the last mentioned part is very rough and tuberculated. The horns are black, and thicker and more compact than in the domestic bull. Certain parts of the hide

smell decidedly of musk, especially during the winter season, and the name of bison has no doubt been bestowed upon it in consequence of that peculiar odour—the German word *wisen* or *bisem* signifying musk. The name of aurochs, by which it is now designated, is probably synonymous with the Latin *urus*, originally applied to another species.

Gilibert had an opportunity of observing the manners of four young bisons, which were taken during the month of January in the forest of Bialowiezenski. They refused to suck a cow, but were at last induced to receive nourishment from a she-goat, raised on a line with their muzzles, by being placed upon a table. As soon as they were satisfied, they sometimes tossed both nurse and table by a blow of their heads to the distance of six or eight feet. The two males died after a lapse of a month. On the termination of the first year, the small manes of the females had made their appearance. They became in season at the age of two years, but refused the approaches of the domestic bull with the greatest indignation. In other respects, they were docile and obedient, caressed their keeper by licking his hands, or rubbing his body gently with their heads and muzzles, and came to him when they heard his voice. They detested the color of scarlet, and drove all the domestic cows from their pastures. The female is said to carry her young eleven months. Judging from the appearance of those described by Gilibert, it might be inferred that they had been produced in the month of December. Now Herberstein states, that the thur or real *urus* produces its young in the spring, and that such as are born in autumn rarely survive. This circumstance may be regarded as an additional support to that theory which maintains that our domestic breed has descended rather from the latter than from the aurochs or European bison.

3.—THE AMERICAN BISON.

(*Bos Bison*, LINN. *Bos Americanus*, GMELIN. Buffalo of the Anglo-Americans, and of CATESBY'S *Carolina*. American Bison, SHAW. *Gen. Zool.* pl. 206.)

According to Raffinesque, this bison has been domesticated in parts of Kentucky and the Ohio. It is reported by some authors to have bred with the tame cow of European origin, and the cross breed is said to continue prolific. But this statement requires confirmation. "Our inquiries on the spot," says Major H. Smith, "never produced a proof, or even an assertion, from the well-informed, that they had seen the hybrid offspring."

The head of the species resembles that of the preceding, and the anterior portions of its body are, in like manner, covered by a curled woolly hair, which becomes excessively long during the winter season; but its legs are shorter, its hinder extremities comparatively weaker, and its tail not nearly so long. It

is said to have fifteen pair of ribs. It inhabits a great extent of territory throughout the temperate and northern parts of North America, and its history will be found pretty fully detailed in the works of Warden, and other recent writers.

4.—THE BUFFALO.

(*Bos bubalus*, LINN. *Le Buffle*, BUFFON. *Arachosian Ox* of ARISTOTLE.)

The forehead of the buffalo is convex or bulging, longer than broad, the direction of the horns is lateral, and they are marked in front by a longitudinal projecting ridge. This animal is a native of India, from whence it was brought into Egypt and Greece. It was introduced into Italy about the close of the sixth century; and numerous herds now graze among the Pontian Marshes. Its milk is excellent, its hide is very strong, its flesh but slightly esteemed.

5.—THE GAYAL.

(*Bos Gævus*, MAJOR SMITH, in Griffith's *Animal Kingdom*. *Bos frontalis*, LAMBERT, Linn. *Trans.*)

Nearly of the size and shape of an English bull, with a dull heavy appearance, but in reality almost equal in strength and activity to the wild buffalo. Horns short, distant at their bases, and rising in a gentle curve directly outwards and upwards. From the upper angles of the forehead proceed two thick, short, horizontal processes of bone, covered by a tuft of light-coloured hair. On these are placed the horns, which are very thick at the base, and slightly compressed, the flattened sides being towards the head and tail. The dewlap is covered with strong longish hair, so as to join a kind of mane on the lower part of the neck; but this is not very conspicuous, when the animal is young. In place of a hump, the gayal has a sharp ridge, which runs along the hinder part of the neck, shoulders, and anterior portion of the back. Inhabits the mountain forests to the east of Burrampootra, Silhet, and Chatgoon. The milk is very rich, though neither abundant nor lasting. The gayal is venerated by the Hindoos. It is domesticated in India. The female has been known to produce with a common Zebu bull of the Deswali breed.

6.—THE YACK.

(*Bos grunniens*, PALLAS. *Grunting Ox* of SHAW and PENNANT. *Soora Goy* of the Hindostanese. *Bos Poëphagus*, HAMILTON SMITH.)

Occiput convex, and covered with frizzled hair; horns round, smooth, pointed, lateral, bending forwards and upwards; withers very high, but not so decidedly hunched as in the zebus, mammæ four, placed *transversely*; ribs fourteen pair; hair on the neck and back, very woolly, whitish and black; tail with very long hair. Sometimes hornless. This species (the *Poëphagus* of Ælian) inhabits the mountains of Central Asia. The *horse-tails*, as they are commonly called, used as standards by the Persians and Turk, are, in fact, made of hair

(usually died a fine crimson) from the tail of the grunting-ox. The *chowries*, or fly-drivers, employed in India, are composed of the same materials. This species is domesticated by the Calmucks, the Mongolians, and other Tartar tribes. These cattle, though not large boned, look very bulky, from the vast quantity of long hair with which they are covered. They have a downcast heavy look, are sullen and suspicious, and usually exhibit considerable impatience at the near approach of strangers. Though not employed in agriculture, they are strong and sure-footed as beasts of burden, and are capable of carrying great weights. "In India," says Mr. Turner, "no man of fashion ever goes out or sits in form at home, without two *chowrabadars*, or brushers attending him, each furnished with one of these tails mounted on silver or ivory handles, to brush away the flies. The Chinese die them of a beautiful red, and wear them as tufts to their summer bonnets."

7.—THE CAPE BUFFALO.

(*Bos Caffer*, SPARMANN.—*Qu' Araho* of the Hottentots.)

This species is distinguished by dark rufous horns, spreading horizontally over the summit of the head, with the beams bent down laterally, and the points turned up. They are from eight to ten inches broad at the base, and divided only by a slight groove, extremely ponderous, cellular near the root, and five feet long, measured from tip to tip along the curves. Hide black, almost naked, especially in old animals. Tail naked, furnished with an elongated tuft of bristles at the end. Lives in families or small herds in the brushwood and open forests of Caffraria. Sparmann and Professor Thunberg have published striking accounts of the strength and ferocity of these animals. Like the Buffalo, Aurochs, and others of the genus, they are capable of being excited almost to madness by any thing of a red colour. They swim with force and agility.

Several other species and varieties have been described by travellers and zoological inquirers; but those above enumerated will suffice for our present purpose.

The following is a summary of the geographical distribution of the principal species of wild cattle. There are two species proper to North America—the Musk Ox (*B. moschatus*), which dwells within the polar circle, and the Bison or American Buffalo (*B. Americanus*), which inhabits from that circle southwards till between the 40th and 35th degrees of north latitude. There are two species characteristic of Europe—the Aurochs or European Bison (*B. Bison*), called Zubr by the Poles, and the genuine Bull (*B. Taurus*), the Thur of the middle ages, and Urus of the ancients, now extinct in the wild state. There are at least four species found in Asia—the Yack or Grunting-Ox (*B. grunniens*)—the common Buffalo (*B. bubalus*)—the Arnee (*B. arnéc*)—and the Gayal (*B. ga-*

væus). There is only one well determined species peculiar to Africa, the Cape Buffalo (*B. Caffer*).

In relation to the localities of species, it thus appears that the zone inhabited by the genus *Bos* stretches obliquely across all climates; and that each species, with the exception of the bull and the buffalo, now widely dispersed from their original centres through the dominating influence of man, is confined within certain circumscribed limits, in which it is retained, as well by natural barriers as by instinctive inclination. The difference in the habits of life observable between the American and European bisons, would, of itself, suffice to establish the specific distinction of these animals. Had they been identical, the aurochs, or European species, would have preserved in America that love of retirement which induces it to dwell in the central solitudes of forests, where (in that of Hercynia) it was found in the days of Cæsar, as it now is in those of Lithuania and the Carpathian Mountains. The American bison, on the contrary, congregates in large troops, and delights to dwell in those open plains or prairies which produce a thick and abundant pasture. The musk ox, without avoiding such stunted forests as the sterile regions to which it is native are capable of producing, yet dwells for the greater part of the year among the rocky and almost ice-covered countries of the extreme north, "creating an appetite under the ribs of death," with little wherewithal to appease that appetite after it is created. The Buffalo (of Asiatic origin) is an animal of almost amphibious habits, fond of the long, coarse, rank pasture which springs up in moist and undrained lands. Hence its love of the Pontian marshes, where, according to Scaliger, it will lie for hours submerged almost to the very muzzle—an instinctive habit which it exhibits equally in Timor, where it was more recently seen to indulge in its aquatic propensities in a similar manner by Dr. Quoy, of the *Uranie*. The Yack inhabits elevated ranges, and the cool and lofty table lands of central Asia. The Buffalo of the Cape, in this respect resembling the aurochs, prefers the dense forests of Southern Africa, though, in the form and volume of its horns, it in some degree coincides in character with the musk-ox, located under a different and very distant clime. All these species, then, with the exceptions above stated, may be regarded as the aborigines of the countries where they now occur.

The urus, or wild bull of ancient authors, may, I think, be reasonably regarded as the origin of our domestic kinds, and it may now also be considered as extinct, at least in Europe. Although we cannot trace it to those temperate regions of Asia, where the human race is supposed to have had its creation and increase, and where probably all those species which man had contrived to subjugate at an early period of his own career,

must likewise have been originally placed; yet its early absence from those countries where mankind, in a state of civilization, first became the dominating power, is a circumstance in no way unconformable with the natural progress of events, or indeed with the almost "invariable sequence" observable in the history of all wild animals of the larger and more unwieldy kinds, when their native boundaries become encroached upon, and consequently circumscribed or intersected by the human race.

The only other animal which has been brought forward as the probable source of our domestic cattle, is the *Aurochs* of the modern Germans, or European Bison (*Bos Bison*), before described. It still inhabits the forests of Southern Russia, those of the Carpathian and Caucasian Mountains, and the deserts of Kobi. There are several considerations which render such a source unlikely, if not impossible. The form of the skull, one of the most invariable characters, is very different in these animals. The forehead of domestic oxen is flat, or even slightly concave; whereas that of the aurochs or bison is arched. In the ox, it is nearly square, or equal in height or breadth, taking the base between the orbits; but, in the aurochs, the breadth of that surpasses the height in the proportion of three to two. But the strongest distinctive character consists in this,—that the aurochs has fourteen pair of ribs, while the ox has only thirteen. In the former animal also, the tongue is blue; in the ox flesh-colour. These, and other circumstances, which need not be here more minutely detailed, render it unadvisable to regard the European bison as the origin of our domestic cattle.

I shall conclude this communication with a few miscellaneous observations of a general nature.

The size of oxen, in general, seems to bear a more immediate relation to the quality of the pasture, than to the nature of the climate. The Danish cows, though lean, are larger than the French; and, when transported to Holland, they become very fat, and yield great quantities of milk. The cattle of the Ukraine, of which the herbage is abundant, are equal in size to any in Europe; and those of Switzerland, which find, even on the tops of mountains, a sweet and highly nutritious pasture, are larger than those of the neighbouring countries. In Barbary, and most of the African regions, where the land is dry and sandy, and the pasture meagre, the cattle are small, and are observed to lose their milk as soon as the calves are removed. So likewise, in many parts of Persia, in Lower Egypt, and Great Tartary, the size of the cattle is proportionate to the scanty supply of herbage; whilst, in Kalmuc Tartary, in Upper Ethiopia, and in Abyssinia, they attain to a much greater size. In northern countries, in temperate climes, and

under equatorial regions, we find cattle of all sizes, and are thus led to infer, that it is the increased abundance of food, rather than any amelioration, or other change of climate, which produces an increase in their dimensions.

The size of the horns does not, in any way, indicate the dimensions of the animal; for some small breeds have large horns, and some good sized ones, such as the Yorkshire polled cattle, have no horns at all. The fact is, that, in cattle, the horns continue to grow even after the animal has, in every other respect, attained its full growth; and, as there is a much greater tendency in the fluids of one individual, than in those of another, to produce that secretion which in its indurated state is called horn, these external organs consequently bear little or no relation to the size of the body. Were the size of the *arnée*, for instance, or great Indian buffalo, to be estimated (on the principle of *ex pede Herculem*), from the extent of its horns, its dimensions would exceed those of the elephant. It is, however, known not to surpass the height of five or six feet, which is only equal to that of the large Hungarian oxen.

Although food and climate are very influential in regulating the size and external aspect of cattle, they do not appear to exert so powerful an influence as to change, or greatly modify, substantially specific characters. The buffalo of Italy is characterized by the same hard black coat of thinly scattered hair as it exhibits among the sultry islands of the Indian Archipelago. The domestic oxen of European origin, which have become wild or domesticated in the Llanos of the Caraccas, and the Pampas of Buenos Ayres, though perhaps more uniformly coloured, present no other distinction to those of Europe. "Oxen," says Buffon, "like other domestic animals, differ in colour, but red appears the most common colour, and the redder they are the more they are esteemed. Some prefer the black; while others assert that those of a bay colour last longest; that the brown are sooner fatigued, and shorter lived; that the grey, brindled, and white, are not proper for farm work, and are only fit to be fattened for slaughter." It is believed in France, that black cows give the best milk, and white ones the greatest quantity.

The sense of smell is acute in all animals. Their sense of sight is somewhat peculiar in its nature. It cannot be said to be very quick in regard to form, distance, or position; and yet it is sometimes exquisitely affected by a peculiar colour, red for example, which frequently renders these animals perfectly furious. This effect is, however, in all probability, related to some inward affection unconnected with an unusually vivid perception in the bodily organ, just as, in certain individuals of the human race, the influence of a musical ear gives rise to ideas and associations in no way dependent upon a quicker perception in the sense of hearing.