

N O T E S

ON THE

S T A

OF

V I R G I N I A.



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Our quadrupeds have been mostly described by Linnæus and Mons. de Buffon. Of these the Mammoth, or big buffalo, as called by the Indians, must certainly have been the largest. Their tradition is, that he was carnivorous, and still exists in the northern parts of America. A delegation of warriors from the Delaware tribe having visited the governor of Virginia, during the revolution, on matters of business, after these had been discussed and settled in council, the governor asked them some questions relative to their country, and among others, what they knew or had heard of the animal whose bones were

were found at the Saltlicks on the Ohio. Their chief speaker immediately put himself into an attitude of oratory, and with a pomp suited to what he conceived the elevation of his subject, informed him that it was a tradition handed down from their fathers, ‘ That in ancient times a herd of
 ‘ these tremendous animals came to the Big-bone
 ‘ licks, and began an universal destruction of the
 ‘ bear, deer, elks, buffaloes, and other animals
 ‘ which had been created for the use of the Indi-
 ‘ ans : that the Great Man above, looking down
 ‘ and seeing this, was so enraged, that he seized
 ‘ his lightning, descended on the earth, seated
 ‘ himself on a neighbouring mountain, on a rock
 ‘ of which his seat and the print of his feet are
 ‘ still to be seen, and hurled his bolts among them
 ‘ till the whole were slaughtered, except the big
 ‘ bull, who presenting his forehead to the shafts,
 ‘ shook them off as they fell ; but missing one at
 ‘ length, it wounded him in the side ; whereon,
 ‘ springing round, he bounded over the Ohio,
 ‘ over the Wabash, the Illinois, and finally over
 ‘ the great lakes, where he is living at this day.’ It is well known that on the Ohio, and in many parts of America further north, tusks, grinders, and skeletons of unparalleled magnitude, are found in great numbers, some lying on the surface of the earth, and some a little below it. A Mr. Stanley, taken prisoner by the Indians near the mouth of the Tennessee, relates, that, after being transferred through several tribes, from one to another, he was at length carried over the mountains west of

of the Missouri to a river which runs westwardly : that these bones abounded there ; and that the natives described to him the animal to which they belonged as still existing in the northern parts of their country ; from which description he judged it to be an elephant. Bones of the same kind have been lately found, some feet below the surface of the earth, in salines opened on the North Holston, a branch of the Tanissee, about the latitude of $36\frac{1}{2}^{\circ}$ north. From the accounts published in Europe, I suppose it to be decided, that these are of the same kind with those found in Siberia. Instances are mentioned of like animal remains found in the more southern climates of both hemispheres ; but they are either so loosely mentioned as to leave a doubt of the fact, so inaccurately described as not to authorize the classing them with the great northern bones, or so rare as to found a suspicion that they have been carried thither as curiosities from more northern regions. So that on the whole there seem to be no certain vestiges of the existence of this animal further south than the salines last mentioned. It is remarkable that the tusks and skeletons have been ascribed by the naturalists of Europe to the elephant, while the grinders have been given to the hippopotamus, or river horse. Yet it is acknowledged, that the tusks and skeletons are much larger than those of the elephant, and the grinders many times greater than those of the hippopotamus, and essentially different in form.

Wherever these grinders are found, there also we find the tusks and skeleton; but no skeleton of the hippopotamus nor grinders of the elephant. It will not be said that the hippopotamus and elephant came always to the same spot, the former to deposit his grinders, and the latter his tusks and skeleton. For what became of the parts not deposited there? We must agree then that these remains belong to each other, that they are of one and the same animal, that this was not a hippopotamus, because the hippopotamus had no tusks nor such a frame, and because the grinders differ in their size as well as in the number and form of their points. That it was not an elephant, I think ascertained by proofs equally decisive. I will not avail myself of the authority of the celebrated * anatomist, who, from an examination of the form and structure of the tusks, has declared they were essentially different from those of the elephant; because another † anatomist, equally celebrated, has declared, on a like examination, that they are precisely the same. Between two such authorities I will suppose this circumstance equivocal. But, 1. The skeleton of the mammoth (for so the incognitum has been called) bespeaks an animal of five or six times the cubit volume of the elephant, as Monf. de Buffon has admitted. 2. The grinders are five times as large, are square, and the grinding surface fluted with four or five

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* Hunter.

† D'Aubenton.

rows of blunt points : whereas those of the elephant are broad and thin, and their grinding surface flat. 3. I have never heard an instance, and suppose there has been none, of the grinder of an elephant being found in America. 4. From the known temperature and constitution of the elephant he could never have existed in those regions where the remains of the mammoth have been found. The elephant is a native only of the torrid zone and its vicinities : if, with the assistance of warm apartments and warm clothing, he has been preserved in life in the temperate climates of Europe, it has only been for a small portion of what would have been his natural period, and no instance of his multiplication in them has ever been known. But no bones of the mammoth, as I have before observed, have been ever found further south than the salines of the Holston, and they have been found as far north as the Arctic circle. Those, therefore, who are of opinion that the elephant and mammoth are the same, must believe, 1. That the elephant known to us can exist and multiply in the frozen zone ; or, 2. That an eternal fire may once have warmed those regions, and since abandoned them, of which, however, the globe exhibits no unequivocal indications ; or, 3. That the obliquity of the ecliptic, when these elephants lived, was so great as to include within the tropics all those regions in which the bones are found : the tropics being, as is before observed, the natural limits of habitation for the elephant. But if it be admitted that

that this obliquity has really decreased, and we adopt the highest rate of decrease yet pretended, that is of one minute in a century, to transfer the northern tropic to the Arctic circle, would carry the existence of these supposed elephants 250,000 years back; a period far beyond our conception of the duration of animal bones left exposed to the open air, as these are in many instances. Besides, though these regions would then be supposed within the tropics, yet their winters would have been too severe for the sensibility of the elephant. They would have had too but one day and one night in the year, a circumstance to which we have no reason to suppose the nature of the elephant fitted. However, it has been demonstrated, that, if a variation of obliquity in the ecliptic takes place at all, it is vibratory, and never exceeds the limits of 9 degrees, which is not sufficient to bring these bones within the tropics. One of these hypotheses, or some other equally voluntary and inadmissible to cautious philosophy, must be adopted to support the opinion that these are the bones of the elephant. For my own part, I find it easier to believe that an animal may have existed, resembling the elephant in his tusks, and general anatomy, while his nature was in other respects extremely different. From the 30th degree of south latitude to the 30th of north, are nearly the limits which nature has fixed for the existence and multiplication of the elephant known to us. Proceeding thence northwardly to $36\frac{1}{2}$ degrees, we enter

ter those assigned to the mammoth. The further we advance north, the more their vestiges multiply as far as the earth has been explored in that direction; and it is as probable as otherwise, that this progression continues to the pole itself, if land extends so far. The centre of the frozen zone then may be the *achmé* of their vigour, as that of the torrid is of the elephant. Thus nature seems to have drawn a belt of separation between these two tremendous animals, whose breadth indeed is not precisely known, though at present we may suppose it about $6\frac{1}{2}$ degrees of latitude; to have assigned to the elephant the regions south of these confines, and those north to the mammoth, founding the constitution of the one in her extreme of heat, and that of the other in the extreme of cold. When the creator has therefore separated their nature as far as the extent of the scale of animal life allowed to this planet would permit, it seems perverse to declare it the same, from a partial resemblance of their tusks and bones. But to whatever animal we ascribe these remains, it is certain such a one has existed in America, and that it has been the largest of all terrestrial beings. It should have sufficed to have rescued the earth it inhabited, and the atmosphere it breathed, from the imputation of impotence in the conception and nourishment of animal life on a large scale: to have stifled, in its birth, the opinion of a writer, the most learned too of all others in the science of animal history, that in the new world, ‘*La nature vivante est*
‘ beaucoup

‘ beaucoup moins agissante, beaucoup moins forte :’* that nature is less active, less energetic on one side of the globe than she is on the other. As if both sides were not warmed by the same genial sun ; as if a soil of the same chemical composition, was less capable of elaboration into animal nutriment ; as if the fruits and grains from that soil and sun, yielded a less rich chyle, gave less extension to the solids and fluids of the body, or produced sooner in the cartilages, membranes, and fibres, that rigidity which restrains all further extension, and terminates animal growth. The truth is, that a Pigmy and a Patagonian, a Mouse and a Mammoth, derive their dimensions from the same nutritive juices. The difference of increment depends on circumstances unsearchable to beings with our capacities. Every race of animals seems to have received from their Maker certain laws of extension at the time of their formation. Their elaborative organs were formed to produce this, while proper obstacles were opposed to its further progress. Below these limits they cannot fall, nor rise above them. What intermediate station they shall take may depend on soil, on climate, on food, on a careful choice of breeders. But all the manna of heaven would never raise the mouse to the bulk of the mammoth.

The opinion advanced by the Count de Buffon†, is 1. That the animals common both to the

* Buffon, xviii. 122 edit. Paris, 1764.

† xviii. 100—156.

the old and new world, are smaller in the latter. 2. That those peculiar to the new are on a smaller scale. 3. That those which have been domesticated in both, have degenerated in America : and 4. That on the whole it exhibits fewer species. And the reason he thinks is, that the heats of America are less ; that more waters are spread over its surface by nature, and fewer of these drained off by the hand of man. In other words, that *heat* is friendly, and *moisture* adverse to the production and developement of large quadrupeds. I will not meet this hypothesis on its first doubtful ground, whether the climate of America be comparatively more humid ? Because we are not furnished with observations sufficient to decide this question. And though, till it be decided, we are as free to deny, as others are to affirm the fact, yet for a moment let it be supposed. The hypothesis, after this supposition, proceeds to another ; that *moisture* is unfriendly to animal growth. The truth of this is inscrutable to us by reasonings à priori. Nature has hidden from us her *modus agendi*. Our only appeal on such questions is to experience ; and I think that experience is against the supposition. It is by the assistance of *heat* and *moisture* that vegetables are elaborated from the elements of earth, air, water, and fire. We accordingly see the more humid climates produce the greater quantity of vegetables. Vegetables are mediately or immediately the food of every animal : and in proportion to the quantity of food,

we see animals not only multiplied in their numbers, but improved in their bulk, as far as the laws of their nature will admit. Of this opinion is the Count de Buffon himself in another part of his work*: “ en general il paroît que les
 “ pays un peu *froids* conviennent mieux à nos
 “ boeufs que les pays chauds, et qu’ils sont d’au-
 “ tant plus gros et plus grands que le climat est
 “ plus *humide* et plus abondans en paturages.
 “ Les boeufs de Danemarck, de la Podolie, de
 “ l’Ukraine et de la Tartarie qu’habitent les Cal-
 “ mouques sont les plus grands de tous.” Here
 then a race of animals, and one of the largest
 too, has been increased in its dimensions by *cold*
 and *moisture*, in direct opposition to the hypothe-
 sis, which supposes that these two circumstances
 diminish animal bulk, and that it is their contra-
 ries *heat* and *dryness* which enlarge it. But when
 we appeal to experience, we are not to rest sa-
 tisfied with a single fact. Let us therefore try
 our question on more general ground. Let us
 take two portions of the earth, Europe and Ame-
 rica for instance, sufficiently extensive to give
 operation to general causes; let us consider the
 circumstances peculiar to each, and observe their
 effect on animal nature. America, running
 through the torrid as well as temperate zone,
 has more *heat* collectively taken, than Europe.
 But Europe, according to our hypothesis, is the
dryest. They are equally adapted then to ani-
 mal productions; each being endowed with one
 of

of those causes which befriend animal growth, and with one which opposes it. If it be thought unequal to compare Europe with America, which is so much larger, I answer, not more so than to compare America with the whole world. Besides, the purpose of the comparison is to try an hypothesis, which makes the size of animals depend on the *heat* and *moisture* of climate. If therefore we take a region, so extensive as to comprehend a sensible distinction of climate, and so extensive too as that local accidents, or the intercourse of animals on its borders, may not materially affect the size of those in its interior parts, we shall comply with those conditions which the hypothesis may reasonably demand. The objection would be the weaker in the present case, because any intercourse of animals which may take place on the confines of Europe and Asia, is to the advantage of the former, Asia producing certainly larger animals than Europe. Let us then take a comparative view of the quadrupeds of Europe and America, presenting them to the eye in three different tables, in one of which shall be enumerated those found in both countries; in a second, those found in one only; in a third, those which have been domesticated in both. To facilitate the comparison, let those of each table be arranged in gradation according to their sizes, from the greatest to the smallest, so far as their sizes can be conjectured. The weights of the large animals shall be expressed in the English avoirdupoise pound and its

decimals: those of the smaller, in the same ounce and its decimals. Those which are marked thus,* are actual weights of particular subjects, deemed among the largest of their species. Those marked thus,† are furnished by judicious persons, well acquainted with the species, and saying, from conjecture only, what the largest individual they had seen would probably have weighed. The other weights are taken from Messrs. Buffon and D'Aubenton, and are of such subjects as came casually to their hands for dissection. This circumstance must be remembered where their weights and mine stand opposed: the latter being stated, not to produce a conclusion in favour of the American species, but to justify a suspension of opinion until we are better informed, and a suspicion, in the mean time, that there is no uniform difference in favour of either; which is all I pretend.