

N^o 169

NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON,

TRANSLATED INTO ENGLISH.

ILLUSTRATED

WITH ABOVE 260 COPPER-PLATES,

AND OCCASIONAL

NOTES AND OBSERVATIONS

BY

THE TRANSLATOR.

VOLUME VI.

EDINBURGH:

Printed for WILLIAM CREECH.

M, DCC, LXXX.

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E R R A T A.

- Page 101. line 17. *for hang read hung*
133. 2. *from the bottom, dele et.*
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145. 2. *for fuckles read fucks.*
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NATURAL HISTORY.



THE ELEPHANT*.

IF the human species be excepted, the Elephant is the most respectable animal in the world. In size he surpasses all other terrestrial creatures; and, by his intelligence, he makes as

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near

* The Elephant has a long cartilaginous trunk, formed of multitudes of rings, pliant in all directions, and terminated with a small moveable hook. The nostrils are at the end of the trunk, which is used, like a hand, to convey any thing into the mouth. This animal has no cutting teeth, but four large flat grinders in each jaw, and in the upper, two vast tusks, pointing forwards, and bending a little upwards; the largest of them imported into Britain are seven feet long, and weigh 152 pounds each. The eyes are small, and the ears long, broad and pendulous. The back is much arched. The legs are thick, and very clumsy and shapeless. The feet are undivided; but their margins are terminated by five round hoofs. The tail is like that of a hog. The colour of the skin is dusky, with a few scattered hairs on it; *Pennant's synopsis*.

In Greek, *Ελεφας*; in Latin, *Elephantus, Barrus*; in Spanish, *Elephante*; in German, *Helphant*; in the East, *Elfil*. *Phil*, or *Fil*, is a Chaldean word which signifies *ivory*, and Munster uses it to denote the *Elephant*. In the East Indies the elephant

was

near an approach to man as matter can approach spirit*. Of all animated beings, the elephant, the dog, the beaver, and the ape, have the most admirable instinct. But this instinct, which is only a result of all the animal powers, both internal and external, manifests itself by very different effects in each of these species. Naturally, and when left at full liberty, the dog is as cruel and bloody as the wolf; but, amidst all this ferocity of disposition, there is one flexible point which we have cherished. Hence the natural dispositions of the dog differ not from those of other rapacious animals, but by this point of sensibility, which renders him susceptible of affection and attachment. It is from Nature that he derives

was formerly called *Barre*; and it is probable that *Barrus* was derived from this word, and afterwards applied by the Latins to the elephant; *Gesner, cap. de Elephanto*. At Congo, it is called *Manzao*, or *Manzo*; *Drake, p. 104*.

Elephas; *Plinii, lib. 8. cap. 1. Raii synopsis quad. p. 131. Klein. quad. p. 36. Ludolph. Æthiop. p. 54. Boullaye-le-Gouz. p. 250. Dellon's voyage, p. 71. Leo Afric. p. 336. Kolben's Cape, vol. 2. p. 98. Bosman's hist. of Guiney, p. 230. Linschottan. iten, p. 55. Du Halde's China, vol. 2. p. 224. Auanfon's voyage, p. 138. Moor's travels, p. 31. Borri's account of Cochin China, p. 795. Barbot's Guiney, p. 141. 206. Seba, tom. 1. p. 175. tab. 3. Edwards, p. 221.*

L'Elephant; *Briffon quad. p. 28.*

Elephas maximus; *Linn. syst. nat. p. 48.*

* *Valet sensu et reliqua sagacitate ingenii excellit elephas; Arist. Hist. anim. lib. 9. cap. 46.—Elephanti sunt natura mites et mansueti, ut ad rationale animal proxime accedant; Strabo.—Vidi elephantos quosdam qui prudentiores mihi videbantur quam quibusdam in locis homines; Tartomannus, apud Gesner. cap. de Elephanto.*

rives this germ of sentiment, which man has cultivated and expanded by living long and constantly in society with this animal. The dog alone was worthy of this distinguished regard; for, being more susceptible of foreign impressions than any other quadruped, all his relative powers have been brought to perfection by his commerce with man. His sensibility, his docility, his courage, his talents, and even his manners, are modified and formed by the example and qualities of his master. We ought not, therefore, to ascribe to him all the powers he appears to possess. His most brilliant qualities are borrowed from us. He has acquired more than other animals, because he is more capable of making acquisitions. Instead of having a repugnance to man, he has a natural bias in favour of the human race. This gentle sentiment, which is always alive, is demonstrated by the desire of pleasing, and has produced docility, fidelity, perpetual submission, and, at the same time, the degree of attention necessary for acting accordingly, and for giving ready obedience to all the commands he receives.

The ape, on the contrary, is as untractable as he is extravagant. His nature, in every point, is equally stubborn. He has no relative sensibilities, no gratitude, no recollection of good treatment or of benefits received. Averse to the society of man, and to every kind of restraint, he has a violent propensity to do every thing that is

4 THE ELEPHANT.

is hurtful or displeasing. But these real faults are compensated by apparent perfections. In his external figure, he resembles man: He has arms, hands, and fingers. The use of these parts alone renders him superior in address to other animals; and the relations they give him to us, in similarity of movements and conformity of actions, please and deceive us, and lead us to ascribe to internal qualities, what depends solely on the structure of his members.

The beaver, whose individual qualities seem far inferior to those of the dog and ape, has, notwithstanding, received from Nature a gift almost equivalent to that of speech. He makes himself so well understood to his own species, that they unite in society, act in concert, undertake and execute large and long continued works; and this social attachment, as well as the result of their mutual intelligence, are more entitled to our admiration than the address of the ape, or the fidelity of the dog.

Hence the genius of the dog (if I may be permitted to profane this term) is borrowed; the ape has only the appearance of it; and the talents of the beaver extend no farther than to what regards himself and his associates. But the elephant is superior to all the three; for in him all their most exalted qualities are united. In the ape, the hand is the principal organ of address. The trunk of the elephant affords him the same means of address as the ape. It serves
instead

instead of an arm and a hand ; and by it he is enabled to raise and lay hold of small as well as large objects, to carry them to his mouth, to place them on his back, to embrace them fast, or to throw them to a distance. He has, at the same time, the docility of the dog, and, like that animal, he is susceptible of gratitude, capable of attachment, is easily accustomed to man, submits less by force than good treatment, serves him with zeal, fidelity, knowledge, &c. In fine, the elephant, like the beaver, loves the society of his equals, and can make himself to be understood by them. They are often observed to assemble together, to disperse, and to act in concert ; and, if they receive no mutual edification, if they carry on no common operation, it must, perhaps, be ascribed to the want of room and of tranquility ; for men have been very antiently multiplied in all the countries inhabited by the elephant ; he is, therefore, perpetually disturbed, and is no where a peaceable possessor of sufficient space to establish a secure abode. We have seen, that all these advantages are necessary to unfold the talents of the beaver, and that, in every place frequented by men, he loses his industry, and receives no edification from associating. Every being has its relative value in Nature. To form a just estimation of the elephant, he must be allowed to possess the sagacity of the beaver, the address of the ape, the sentiment of the dog, together with the peculiar advantages

ges of strength, largeness, and long duration of life. Neither should we overlook his arms or tusks, which enable him to transfix and conquer the lion. We should also consider, that the earth shakes under his feet; that with his hand he tears up trees*; that, by a push of his body, he makes a breach in a wall; that, though tremendous in strength, he is rendered still more invincible by his enormous mass, and by the thickness of his skin; that he can carry on his back an armed tour filled with many warriors; that he works machines, and carries burdens which six horses are unable to move; that to this prodigious

* *Veteres proboscidem elephantum manum appellaverunt.—Eadem aliquoties nummum e terra tollentem vidi, et aliquando detrahentem arboris ramum, quem viri viginti-quatuor fune trahentes ad humum flectere non potueramus; cum solus elephas tribus vicibus motum detrahebat; Vartomannus, apud Gesner. cap. de Elephanto.—Silvestres elephantum fagos, oleastros, et palmas dentibus subvertunt radicitus; Oppian.—Promuscis elephantum naribus est qua cibum, tam siccum quam humidum, ille capiat, orique perinde ac manu admoveat. Arborea etiam eadem complectendo evellit; denique ea non alio utitur modo nisi ut manu; Aristot. de partibus animalium lib. 2. cap. 16.—Habet praeterea talem tantamque narem elephantus, ut ea manus vice utatur. Suo etiam rectori erigit atque offert, arborea quoque eadem prosternit, et quoties immerfus per aquam ingreditur, ea ipsa edita in sublime refert atque respirat; Arist. hist. anim. lib. 2. cap. 1.—The strength of the elephant is so amazing that it can only be known from experience. I have seen an elephant carry on his tusks two cannons, fixed together with cables, each weighing three thousand pounds, which he first raised from the ground, and then carried them to the distance of five hundred paces. I have also seen an elephant draw ships and galleys upon land, in order to set them afloat; Voyages de Fr. Pyrard, tom. 2. p. 356.*

digious strength he adds courage, prudence, coolness, and punctual obedience; that he preserves moderation even in his most violent passions; that he is constant and impetuous in love *; that, when in anger, he mistakes not his friends; that he never attacks any but those who offend him; that he remembers favours as long as injuries; that, having no appetite for flesh, he feeds on vegetables alone, and is born an enemy to no animal; and, in fine, that he is universally beloved, because all animals respect, and none have any reason to fear him.

Men likewise, in all ages, have had a kind of veneration for this first and grandest of terrestrial creatures. The antients regarded him as a miracle of Nature; and, indeed, he is her highest effort. But they have greatly exaggerated his faculties. They have, without hesitation, ascribed to him intellectual powers and moral virtues. Pliny, Ælian, Solinus, Plutarch, and other authors of a more modern date, have given to these animals rational manners, a natural and innate religion †, a kind of daily adoration of the

* Nec adulteria nocere, nec ulla propter foeminas inter se praelia, caeteris animalibus pernicialia, non quia desit illis amoris vis, &c.; *Plin. lib. 8. cap. 5.*—Mas quam impleverit coitu, eam amplius non tangit; *Aristot. Hist. anim. lib. 9. cap. 46.*

† Hominum indigenarum linguam elephanti intelligunt; *Ælian. lib. 4. cap. 24.* Luna nova nitescente, audio elephantos naturali quadam et ineffabili intelligentia e silva, ubi pascentur, ramos recens decerptos auferre, eosque deinde in sublime

the sun and moon, the use of ablution before worship, a spirit of divination, piety toward heaven and their fellow-creatures, whom they assist at the approach of death, and, after their decease, bedew them with tears, cover them with earth, &c. The Indians, prejudiced with the notion of the metempsychosis or transmigration of souls, are still persuaded, that a body so majestic as that of the elephant must be animated with the soul of a great man or a king. In Siam*, Laos,

sublime tollere, ut suspicere, et leviter ramos movere, tanquam supplicium quoddam Deae protendentes, ut ipsis propria et benevola esse velit; *Ælian. lib. 4. cap. 10.*—Elephas est animal proximum humanis sensibus. . . . Quippe intellectus illis fermonis patrii et imperiorum obedientia, officiorumque, quae didicere, memoria, amoris et gloriae voluptas: Imo verò, quae etiam in homine rara, probitas, prudentia, aequitas, religio quoque siderum, solisque ac lunae veneratio. Autores sunt, nitescente luna nova, greges eorum descendere; ibique se purificantes solenniter aqua circumspergi, atque, ita salutato fidere, in silvas reverti. . . . Visique sunt fessi aegritudine, herbas supini in coelum jacentes, veluti tellure precibus allegata; *Plin. Hist. Nat. lib. 8. cap. 1.*—Se abluunt et purificant, dein adorant solem et lunam.—Cadavera sui generis sepeliunt.—Lamentant, ramos et pulverem injiciunt supra cadaver.—Sagittas extrahunt tanquam Chirurgi periti; *Plin. Ælian. Solin, Tzetzes, &c.*

* M. Constance conducted the ambassador to see the white elephant, which is so esteemed in India, and has given rise to so many wars. He is very small, and so old, that he is all wrinkled. Several mandarins are appointed to take care of him, and his victuals are served up to him in large golden vessels. His apartment is magnificent, and the inside of it is handsomely gilded; *Premier voyage du P. Tachard, p. 239.* In a country-house belonging to the king, situated upon the river about a league from Siam, I saw a small white elephant,

Laos, Pegu *, &c. the white elephants are regarded as the living *manes* of the Indian Emperors. Each of these animals have a palace, a number of domestics, golden vessels filled with the choicest food, magnificent garments, and they are absolved from all labour and servitude. The Emperor is the only personage before whom they bow the knee, and their salute is returned by the Monarch. By all these attentions,

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honours,

phant, which was destined to be successor to the one in the palace, which is said to be three hundred years old. This little elephant is somewhat larger than an ox, and is attended by many mandarins; and, out of respect to him, his mother and ant are kept along with him; *Idem*, p. 273.

* When the King of Pegu walks abroad, four white elephants, adorned with precious stones and ornaments of gold, march before him; *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom. 3. p. 43. When the King of Pegu gives audience, the four white elephants are presented to him, who do him reverence by raising their trunks, opening their mouths, making three distinct cries, and then kneeling. When raised, they are led back to their stables, and there each of them are fed in large golden vessels. They are twice a day washed with water taken from a silver vessel. During the time of their being dressed in this manner, they are under a canopy supported by eight domestics, in order to defend them from the heat of the sun. In going to the vessels which contain their food and water, they are preceded by three trumpets, and march with great majesty, regulating their steps by music, &c.; *Idem*, tom. 3. p. 40.—White elephants are held to be sacred by the natives of Pegu: Having learned that the King of Siam had two, they sent ambassadors offering any price that should be demanded for them. But the King of Siam would not sell them. His Majesty of Pegu, incensed at this refusal, came with his army, and not only carried off the elephants by force, but rendered the whole country tributary to him; *Idem*, tom. 2. p. 223.

honours, and marks of respect, they are flattered, but not corrupted. This circumstance alone should be sufficient to convince the Indians, that these animals are not endowed with human souls.

After removing the fabulous credulities of antiquity, and the puerile fictions of superstition, which still exist, the elephant, even to philosophers, possesses enough to make him be regarded as a being of the first distinction. He deserves to be known, and to be studied. We shall, therefore, endeavour to write his history with impartiality. We shall first consider him in a state of nature, when he is perfectly free and independent, and afterwards in a state of servitude, when the will of his master is partly the motive of his actions.

In a wild state, elephants are neither sanguinary nor ferocious. Their dispositions are gentle, and they make not a wrong use of their arms or their strength; for they never exert them but in defending themselves, or in protecting their companions. Their manners are social; for they are seldom seen wandering alone. They generally march in troops, the oldest keeping foremost *, and the next in age bringing up the rear. The young and the feeble are placed in the middle. The mothers carry their young
firmly

* Elephanti gregatim semper ingrediuntur; ducit agmen maximus natu, cogit aetate proximus. Amnes transituri minimos praemittunt, ne majorum incessu atterente alveum, crescat gurgitis altitudo; *Plin. hist. nat. lib. 8. cap. 5.*

firmly embraced in their trunks. They observe not this order, except in perilous marches, when they want to pasture on cultivated fields. In the deserts and forests, they travel with less precaution, but without separating so far as to exceed the possibility of receiving assistance from one another. Some of them, however, occasionally wander, or lag behind the troop; and it is these alone whom the hunters dare venture to attack; for a little army is necessary to assail a whole troop*; and they are never vanquished but at the expence of several lives. It is even dangerous to do them the smallest injury †; for they run straight upon the offender,

* I still tremble when I think of the danger to which we exposed ourselves in pursuing a wild elephant; for, though there were only ten or a dozen of us, the one half of which were not well armed, if we could have come up with him, we would have been foolish enough to make the attack. We thought we might kill him by two or three shot. But I afterwards saw that this business requires two or three hundred men; *Voyage de Guinée, par Guillaume Bosman, p. 436.*

† Solent elephanti magno numero confertim incedere, et si quemdam obvium habuerint, vel devitant, vel illi cedunt; at si quemdam injuria afficere velit, proboscide sublatam in terram dejicit, pedibus deculcans donec mortuum reliquerit; *Leonis Africani Descript. Africae, p. 744.*—The Negroes unanimously relate, that the elephants, when they meet any person in the woods, do him no harm, unless they are attacked; but that, when shot at, and not mortally wounded, they become extremely furious; *Voyage de Guinée, par Bosman, p. 245.*—The wild elephant is provoked to pursue a man, and is then caught in a pit-fall; *Journal du Voyage de Siam, par l'Abbé de Choisy, p. 242*—Those who hurt

der, and, though the weight of their bodies be great, their steps are so long that they easily overtake the most agile man. They then transfix him with their tusks, or, laying hold of him with their trunk, throw him against a stone, and put an end to his existence by trampling him under their feet. But it is only when provoked that they kill men in this manner, and never injure those who do not disturb them. But, as they are extremely suspicious and sensible of injuries, it is proper to avoid them; and the travellers who frequent the countries inhabited by elephants, kindle fires during the night, and beat drums to prevent their approach. When they have been once attacked by men, or have fallen into a snare, they are said never to forget it; but take every opportunity of revenge. As their sense of smelling is, perhaps, more perfect than that of any other animal, the smell of a man strikes them at a great distance, and they can easily follow him by the scent. The antients relate, that the elephants tear the grass off the ground upon which the hunters have passed, and that they hand it about to each other for the purpose of receiving information concerning the passage and march of the enemy.

These

or insult an elephant, should be much on their guard; for these animals do not easily forget injuries, until they accomplish their revenge; *Recueil des voyages de la Campagne des Indes de Hollande, tom. 1. p. 413.*

These animals love the banks of rivers *, deep vallies, and shady moist places. They cannot dispense with water, which they trouble before drinking. They often fill their trunk with water, either to carry it to their mouth, or solely for refreshing their nose, and amusing themselves by throwing it back into the river, or besprinkling it around. They cannot support cold, and likewise suffer by extreme heat. To avoid the ardour of the sun's rays, they retire into the most shady recesses of the forests. They frequently take to the water: The enormous size of their bodies rather aids than retards their swimming; for they sink not proportionably so deep as other animals; and the length of their trunk, which they hold up in the air, and through which they respire, removes from them all apprehensions of being drowned.

Roots, herbs, leaves, and tender wood, are their common food. They likewise eat grains and fruits. But they disdain flesh and fish †. When one of them discovers a plentiful pasture, he calls to the others, and invites them to eat with him ‡. As they require a vast quantity

* Elephanti naturae proprium est rosida loca et mollia amare et aquam desiderare, ubi versari maxime studet; ita ut animal palustre nominari possit; *Ælian. lib. 4. cap. 24.*

† The most savage of these animals eat no flesh, but live solely upon leaves, branches, and twigs of trees, which they break off with their trunk, and even brouse pretty strong wood; *Voyage de Fr. Pyrard. tom. 2. p. 367.*

‡ Cum eis caetera pabula defecerint, radices effodiunt, quibus

tity of forage, they often change their place of pasturing; and, when they come upon cultivated fields, they do incredible damage. Their bodies being of an enormous weight, they destroy ten times more with their feet than they use for food, which generally amounts to one hundred and fifty pounds of grafs a day; and, as they always go in troops, they lay a whole country waste in a single hour. For this reason, the Indians and Negroes use every artifice to prevent the approach of these animals, or to fright them away. They make great noises, and kindle large fires round their cultivated fields. But, notwithstanding these precautions, the elephants sometimes pay them a visit, drive off the domestic cattle, put the men to flight, and, not unfrequently, overturn their limber habitations. It is difficult to scare them; and they are not susceptible of fear. Nothing can surprize them, or stop their progress, but artificial fires *, or crackers, which the natives throw at them, and the

quibus pascuntur; e quibus primus qui aliquam praedam repererit, regreditur ut et suos gregales advocet, et in praedae communionem deducat; *Ælian. lib. 9. cap. 56.*

* When the elephant is enraged, nothing stops his career but artificial fires. When fighting, the same means are employed to disengage them from the combat; *Relat. par Thevenot, tom. 3. p. 133.*—The Portuguese know no other mode of defending themselves against the elephant, but throwing squibs or torches in his eyes; *Voyage de Feynes, p. 89.*—In the Mogul empire, elephants are made to combat with each other. They fight so obstinately, that they can only be separated by throwing artificial fires between them; *Voyage de Bernier, tom. 2. p. 64.*

the sudden and repeated noise sometimes induces them to turn back. It is not easy to make them separate from each other; for they generally act in concert, whether they attack, march, or fly.

When the females come in season, this attachment to society yields to a stronger passion. The troop separates into pairs, which love had previously formed. They unite from choice, steal off in quest of retirement, and their march seems to be preceded by love, and followed by modesty; for all their pleasures are accompanied with the profoundest mystery. They have never been detected in their amours. They anxiously avoid the presence or inspection of their neighbours; and know, perhaps, better than the human race, how to enjoy pleasure in secret, and to be entirely occupied with a single object. They search for the deepest solitudes of the woods, that they may give full vent, without disturbance or reserve, to all the impulses of Nature *, which are lively and durable, in proportion to the long interval of abstinence. The female goes with young two years †: When impregnated, the male abstains; and his season of love returns
but

* *Elephanti solitudines petunt coituri, et praecipue secus flumina; Arist. Hist. Anim. lib. 5. cap. 2.*—Pudore nunquam nisi in abdito coeunt; *Plin. lib. 8. cap. 5.*

† *Mas coitum triennio interposito repetit. Quam gravidam reddidit, eandem praeterea tangere nunquam patitur. Uterum biennio gerit; Arist. Hist. Anim. lib. 5. cap. 14.*—Elephantus biennio gestatur, propter exuperantiam magnitudinis; *Idem, de Generat. Anim. lib. 4. cap. 10.*

but once in three years. The females produce only one young *, which, at the moment of birth, has teeth †, and is as large as a wild boar. There is no appearance, however, of the horns or tusks. Soon after, they begin to shoot; and, at the age of six months, they are several inches long ‡. The animal is then larger than an ox, and the tusks continue to grow and enlarge till the most advanced age, provided the creature enjoys health and liberty; for it is not to be imagined what changes may be introduced into the temperament and habits of the elephant by slavery and unnatural food. They are easily tamed, instructed, and rendered submissive; and, as they are stronger and more intelligent than any other animal, their service is more ready, more extensive, and more useful. But the disgust arising from their situation is probably never eradicated: For, though they feel, from time to time, the most lively impressions of love, they neither intermix nor produce in a domestic state. Their constrained passion degenerates into fury. Being unable to gratify themselves without witnesses, they fret, lose patience, and, at last, their indignation becomes so violent, that the strongest chains,

* Quae maxima inter animalia sunt, ea singulos pariunt, ut elephas, camelus, equus; *Arist. de Generat. Anim. lib. 4. cap. 4.*

† Statim cum natus est elephantus dentes habet, quanquam grandes illos (dentes) non illico conspicuos obtinet; *Arist. Hist. Anim. lib. 2. cap. 5.*

‡ Thomas Lopes, apud Gesnerum, cap. de Elephanto.

chains, and fetters of every kind, are necessary to repress their movements, and to break their rage. Hence they differ from all other domestic animals, who are managed by men as if they had no will of their own. They are not of the number of those born slaves, which we propagate, mutilate, or multiply, purely to answer our own purposes. Here the individual alone is a slave. The species remains independent, and uniformly refuses to augment the stores of their tyrants. This circumstance shows the elephant to be endowed with sentiments superior to the nature of common brutes. To feel the most ardent passion, and, at the same time, to deny the gratification of it, to experience all the fury of love, and not to transgress the laws of modesty, are, perhaps, the highest efforts of human virtue; and yet, in these majestic animals, they are only common and uniform exertions. The indignation they feel, because they cannot be gratified in secret, becomes stronger than the passion of love, suspends and destroys the effects of it, and, at the same time, excites that fury, which, during these paroxysms, renders them more dangerous than any wild animal.

We are inclined, were it possible, to doubt of this fact; but all naturalists, historians, and travellers, concur in assuring us, that the elephants never produce in a domestic state *. The Prin-

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* It is remarkable, that the male never covers the female, though she indicates the strongest marks of desire, in situations where

ces of India keep great numbers of elephants; and, after many fruitless attempts to multiply them like other domestic animals, they found it necessary to separate the males from the females, in order to diminish the frequency of those ineffectual ardours, which are always accompanied with fury. Hence there are no domestic elephants which have not formerly been wild: and the manner of taking, taming, and rendering them submissive †, merits particular attention.

where they may be exposed to the observation of men; *Voyage de Fr. Pyrard, p. 357.*—The elephants never couple but in secret, and produce only one at a birth; *Cosmographie du Levant, par Thevet, p. 70.*

† I went to see the grand hunting of the elephants, which was performed in the following manner: The King sent a great number of women into the woods; and, when the report was brought that they had discovered a troop of elephants, he despatched thirty or forty thousand men, who made a large circle round the place. They posted themselves in fours, at the distance of twenty or twenty-five feet from each other, and at every station they kindled a fire, which was raised about three feet above the surface of the earth. There was another circle composed of elephants trained to war, distant from one another about a hundred or a hundred and fifty paces; and, in such places as the wild elephants might most easily escape, the war elephants were posted closer. There were cannons in several places, which are discharged when the wild elephants attempt to force a passage; for they are terrified at fire. This circle is daily diminished, and at last becomes so small, that the fires are not above five or six paces distant. As the elephants hear a great noise all round them, they dare not fly, though it is not uncommon for some of them to make their escape; for I was told that ten of them got off in one day. When the hunters want to seize them, they are made to enter a place surrounded with
stakes,

tion. In the midst of the forest, and in the neighbourhood of places frequented by the elephants, a spot is chosen, and surrounded with strong palisades. The largest trees of the wood serve as the principal stakes, to which are fixed cross bars that support the other stakes. A large opening is left, through which the elephant may enter; and over this door there is a trap, or rather it receives a strong bar, which is shut after the animal passes. To draw him into this enclosure, the hunters go in quest of him: They carry along with them into the forest a tamed female in season; and, when they imagine themselves to be near enough to be heard, her governor makes her utter the cry of love. The wild male instantly replies, and hastens to join her. She is then made to march towards the enclosure, repeating the cry from time to time. She arrives first; and the male, following her by the scent, enters by the same port. As soon as he perceives the hunters, and sees himself surrounded,

ed,
 stakes, where there are also some trees, between which a man can easily pass. There is another circle of war elephants and soldiers, into which some men enter mounted on elephants, who are extremely dexterous in throwing ropes round the hind legs of these animals. When fixed in this manner, the wild elephant is put between two tame elephants, and a third one is appointed to push him behind in such a manner as obliges him to go forward; and, when he grows mischievous, the others give him blows with their trunks. He is then led off into captivity; and the others are seized in the same manner. I saw ten of them taken. The King was present, and gave every necessary order; *Relation de l'Ambassade de M. Chevalier de Chaumont à la cour du Roi de Siam, p. 91.*

ed, his ardour vanishes, and is changed into fury. Ropes and fetters are thrown round his legs and trunk. Two or three tamed elephants, conducted by men expert in that business, are brought to him, and they endeavour to fix him to one of the animals. In fine, by address, by force, by torture and caresses, he is tamed in a few days. I will not enter into a more particular detail, but content myself with quoting from those travellers who have been eye-witnesses of the hunting of elephants *, which

* At a quarter of a league from Luovo, there is a kind of large amphitheatre, of a rectangular figure, surrounded with high terrace walls, upon which the spectators are placed. Within these walls, there is a palisade of strong posts fixed in the ground, behind which the hunters retire when pursued by the enraged elephants. A large opening is left on the side next the fields, and, opposite to it, next the city, there is a smaller one, which leads to a narrow alley, through which an elephant can pass with difficulty, and this alley terminates in a large shade where the operation of taming is finished.

When the day destined for the chase arrives, the hunters enter the woods, mounted on female elephants trained to this exercise. The men cover themselves with leaves of trees, to prevent their being observed by the wild elephants. When they have advanced into the forest, and think that some elephants may be in the neighbourhood, they make the females utter certain cries, fitted to allure the males, who instantly reply by frightful roarings. Then the hunters, when they perceive the elephants at a proper distance, return, and lead the females gently back toward the amphitheatre above described. The wild elephants never fail to follow. The male, which we saw tamed, entered the enclosure spontaneously along with the females, and the passage was immediately shut. The females continue their march across the amphitheatre, and

which differs in different countries, and according to the strength and dexterity of the people who

and filed off one by one into the narrow alley at the other end. The wild elephant, who had followed them all along, kept at the entrance of this defile. Every method was tried to make him enter. The females, who were now beyond the alley, were made to cry. Some Siamese irritated him, by clapping their hands, and crying *pat, pat*. Others teased him with long poles armed with sharp points; and, when pursued, they slip through between the posts, and conceal themselves behind the palisade, which the elephant cannot surmount. Lastly, after having pursued several hunters in vain, he singles out one, whom he sets upon with extreme fury. This man runs into the narrow alley, and the elephant follows him. But, he no sooner enters than he perceives himself to be in a snare; for the man escapes, and two portcullises, one before and another behind, are instantly let fall; so that, being unable either to advance or retreat, the animal makes the most astonishing efforts, and raises the most hideous cries. The hunters endeavour to sooth him by throwing pails of water on his body, by rubbing him with leaves, by pouring oil upon his ears, and by bringing to him tamed elephants, both male and female, who caress him with their trunks. They fix ropes, however, round his body and hind legs, to enable them to drag him out, and they continue to throw water on his trunk and body, in order to refresh him. In fine, a tamed elephant, accustomed to instruct noviciates, is made to approach him. The former is mounted by a servant, who makes the animal advance and retire, to show the wild elephant that he has nothing to fear, and that he may go out. The port is then opened, and he follows his neighbour to the end of the alley. When there, two elephants are tied, one to each side of him, another marches before, leads him in the way they want him to go, while a third pushes him behind with its head, till they arrive at a kind of shade, where he is tied to a large post, which turns round like the capstan of a ship. There he is left till next day, to allow his rage to subside. But, while he frets around this post, a Bramin, one of those Indian priests who are extremely

who make war against them ; for, instead of making, like the King of Siam, walls, terrasses, palisades,

tremely numerous in Siam, dressed in white, approaches the animal, mounted on an elephant, turns gently round him, and bedews him with a consecrated water, which the priest carries in a golden vessel. They believe that, by this ceremony, the elephant loses his natural ferocity, and is rendered fit for the King's service. Next day, he walks along with his enslaved neighbours ; and, at the end of fifteen days, he is completely tamed ; *Premier Voyage du P. Tachard, p. 298.*

They had no sooner alighted from their horses, and mounted the elephants which were prepared for them, than the King appeared, accompanied with a great number of Mandarins, riding on elephants of war. They all proceeded about a league into the wood, when they arrived at the place where the wild elephants were enclosed. This was a square park, of three or four hundred geometrical paces, the sides of which were fenced with large stakes ; in which, however, considerable openings were left at certain distances. It contained fourteen large elephants. As soon as the royal train arrived, a circle was formed, consisting of a hundred war elephants, which were placed round the park to prevent the wild ones from forcing through the palisades. We were stationed behind this fence, near the King. A dozen of the strongest tame elephants were pushed into the park, each of them being mounted by two men, furnished with large ropes and nooses, the ends of which were fixed to the elephants they rode. They first ran against the elephant they wished to seize, who, seeing himself pursued, endeavoured to force the barrier and make his escape. But the whole was blockaded by the war-elephants, who pushed him back ; and, in his course, the hunters, mounted on the tame elephants, threw their nooses so dexterously upon the spots where it behoved the animal to place his feet, that the whole were seized in the space of an hour. Each elephant was then bound with ropes, and two tame ones placed on each side of him, by means of which, he is tamed in fifteen days ; *Idem, p. 340.*

A few days after, we had the pleasure of being present at the hunting of elephants. The Siamese are very dexterous at this species

palisades, parks, and vast enclosures, the poor Negroes content themselves with the most simple artifices.

species of hunting, which they have several modes of performing. The easiest, and not the least entertaining, is executed by means of female elephants. When a female is in season, she is conducted to the forest of Luovo. Her guide rides on her back, and covers himself with leaves, to prevent his being perceived by the wild elephants. The cries of the tame female, which she never fails to set up upon a certain signal given by the guide, collect all the elephants within the reach of hearing, who soon follow her. The guide, taking advantage of their mutual cries, returns slowly toward Luovo with all his train, and enters an enclosure made of large stakes, about a quarter of a league from the city, and pretty near the forest. A great troop of elephants were, in this manner, brought together; but one of them only was large, and it was very difficult to seize and to tame him.—The guide who conducted the female went out of the enclosure by a narrow passage, in the form of an alley, and about the length of an elephant. Each end of this alley was provided with a portcullis, which was easily raised or let down. All the young elephants followed the female at different times. But a passage so narrow alarmed the large one, who always drew back. The female was made to return several times; he uniformly followed her to the port; but, as if he foresaw his loss of liberty, he would never pass. Several Siamese, who were in the park, then advanced, and endeavoured to force him, by goading him with sharp pointed poles. The elephant, being enraged by this treatment, pursued them with such fury and quickness, that not one of them would have escaped, had they not nimbly retired behind the stakes of the palisade, against which the ferocious creature broke its large tusks three or four times. In the heat of the pursuit, one of those who attacked him most briskly, and who was most keenly pursued, run into the alley, which the elephant entered, in order to kill him. But the animal no sooner fell into the snare, than the Siamese escaped by a small passage, and the two portcullises were instantly let down. The elephant struggled much; but he found himself obliged to remain

artifices. They dig *, in the places where the elephants are supposed to pass, ditches so deep, that, after falling into them, there is no possibility of getting out.

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remain in his prison. To appease him, they threw pailfulls of water on his body. Ropes, however, were put round his legs and neck. After being fatigued for some time, he was brought out by means of two tame elephants who drew him forward with ropes, while other two pushed him behind, till he was fixed to a large post, round which he could only turn. In an hour after, he became so tractable, that a Siamese mounted on his back; and next day he was let loose, and conducted to the stables along with the others; *Second voyage du P. Tachard, p. 352.*

* Though these animals be large and savage, great numbers of them are taken in Æthiopia by the following stratagem: In the thickest parts of the forest, where the elephants retire during the night, an enclosure is made of stakes, interlaced with large branches, in which a small opening is left, which has a door lying flat on the ground. When the elephant enters, the hunters, from the top of a tree, draw up the door, by means of a rope. They then descend and slay the animal with arrows. But if, by accident, they miss their aim, and the animal escapes from the enclosure, he kills every man he meets; *L'Afrique de Marmol, tom. 1. p. 58.*—There are different modes of hunting elephants. In some places, caltrops are spread on the ground, by means of which the animals fall into ditches, from whence, after being properly entangled, they are easily drawn out. In others, a tame female is led into a narrow defile, and allures the male to approach by her cries. When he arrives, the hunters shut him up by barriers, which they have in readiness for the purpose; and, though he finds the female on her back, he copulates with her, contrary to the practice of other quadrupeds. After this, he endeavours to retire. But, while he goes about in quest of an outlet, the hunters, who are upon a wall, or some elevated situation, throw ropes and chains of different dimensions, by which they so entangle his trunk and the rest of his body, that they can approach him without danger; and, after

The elephant, when tamed, becomes the most gentle and most obedient of all domestic animals. He is so fond of his keeper, that he caresses him, and anticipates his commands, by foreseeing e-

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ter taking some necessary precautions, they carry him off, accompanied with two tame elephants, to show him a proper example, or to chastise him if he rebels.—There are many other methods of hunting elephants; for every country has its own mode; *Relation d'un voyage par Thevenot, tom. 3. p. 131.*—The inhabitants of Ceylon dig pretty deep ditches, which they cover with thin planks and straw. During the night, the elephants, having no suspicion of the deceit, come upon the planks, and fall into the ditch, from which they are unable to escape, but would infallibly perish by hunger, if victuals were not brought to them by slaves, to whom they gradually become accustomed, and at last are rendered so tame, that they are brought to Goa, and other adjacent countries, to gain their own livelihood and that of their masters; *Divers memoires touchant les Indes Orientales, premier discours, tom. 2. p. 257. Recueil des voyages de La Compagnie des Indes, Amst. 1711.*—As the Europeans give a high price for elephants teeth, the love of gain arms the Negroes perpetually against these animals. For this species of hunting, they sometimes assemble in great bodies, with their arrows and darts. But the most common and most successful method is that of digging ditches in the woods, because they are never deceived in distinguishing the track of the elephants.—There are two methods of taking these animals, either by digging ditches and covering them with the branches of trees, into which the creatures inadvertently fall, or by hunting them, which is performed in the following manner. In the island of Ceylon, where the elephants are very numerous, the hunters keep female elephants, which they call *alias*. As soon as they learn that there are wild elephants in any place, they repair thither, accompanied with two of these *alias*, which, whenever a male is discovered, they let loose. The females come up on each side of him, and keeping him in the middle, squeeze him so hard that he cannot escape; *Voyage d'Orient, du P. Philippe de la très-sainte Trinité, p. 361.*

very thing that pleases him. He soon learns to comprehend signs, and even to understand the expression of sounds. He distinguishes the tones of command, of anger, or of approbation, and regulates his actions accordingly. He never mistakes the voice of his master. He receives his orders with attention, executes them with prudence and eagerness, but without any degree of precipitation; for his movements are always measured, and his character seems to partake of the gravity of his mass. He easily learns to bend his knees for the accommodation of those who mount him. His friends he caresses with his trunk, salutes with it such people as are pointed out to him, uses it for raising burdens, and assists in loading himself. He allows himself to be clothed, and seems to have a pleasure in being covered with gilded harness and brilliant housings. He is employed in drawing chariots*, ploughs,

* I was an eye-witness to the following facts. At Goa, there are always some elephants employed in the building of ships. I one day went to the side of the river, near which a large ship was building in the city of Goa, where there is a large area filled with beams for that purpose. Some men tie the ends of the heaviest beams with a rope, which is handed to an elephant, who carries it to his mouth, and after twisting it round his trunk, draws it, without any conductor, to the place where the ship is building, though it had only once been pointed out to him. He sometimes drew beams so large that more than twenty men would have been unable to move. But, what surprised me still more, when other beams obstructed the road, he elevated the ends of his own beams, that they might run easily over those which lay in his way. Could the most enlightened man do more?

ploughs, waggons, &c. He draws equally, and never turns restive, provided he is not insulted with improper chastisement, and the people who labour with him have the air of being pleased with the manner in which he employs his strength. The man who conducts the animal generally rides on his neck, and uses an iron rod *, hooked at the end, or a bodkin, with which he pricks the head or sides of the ears, in order to push the creature forward, or to make him turn. But words are generally sufficient †, especially if the animal has had time to acquire a complete acquaintance with his conductor, and to put entire confidence in him. The attachment of the elephant becomes sometimes so strong, and his affection so warm and durable, that he has been known to die of sorrow, when,
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more? *Voyage d'Orient. du P. Philippe de la très-sainte Trinité, p. 367.*

* The conductor rides on the elephant's neck, and uses no bridle, reins, or any kind of stimulus, but only a large iron rod, sharp and hooked at the end, with which he spurs on the animal, and likewise directs the way, by pricking his ears, muzzle, and other places that have most sensibility. This rod, which would kill any other animal, is hardly sufficient to make an impression on the skin of the elephant, or to keep him in subjection when irritated; *Voyage de Pietro della Valle, tom. 4. p. 247.*—Two servants, the one mounted on the neck, and the other on the crupper, manage the elephant, by means of a large iron hook; *Premier voyage du P. Tachard, p. 273.*

† Non freno aut habenis aut aliis vinculis regitur bellua, sed insidentis voci obsequitur; *Vartoman. apud Gesner. cap. de Elephantis.*

in a paroxysm of rage, he had killed his guide*.

Though the elephant produces but a single young one in two or three years, the species is very numerous. The prolific powers of animals are proportioned to the shortness of their lives. In elephants, the duration of life compensates their sterility; and, if it be true that they live two centuries, and can propagate till they are one hundred and twenty years old, each couple may produce forty in this period. Besides, as they have nothing to fear from other animals, and are taken with much difficulty and hazard by men, the species is easily supported, and is generally diffused over all the southern regions of Africa and Asia. Elephants abound in Ceylon †, in

* *Quidam iracundia permotus cum cessorem suum occidisset, tam valde desideravit, ut, poenitudine et moerore confectus, obierit; Arrianus in Indicis.*

† In Ceylon there are many elephants, whose teeth bring much riches to the inhabitants; *Voyage de Fr. Pyrard, tom. 2. p. 151* — There are vast numbers of elephants in India, most of which are brought from the island of Ceylon; *Voyage de la Boullaye-le-Gouz, p. 250.* — At Deli, as well as other parts of India, there are different kinds of elephants; but those brought from Ceylon are preferred to all the rest; *Relation d'un voyage, par Thevenot, tom. 3. p. 131.* — In the island of Ceylon there are many elephants, and they are more generous and noble than those of other countries; *Voyage d'Orient, du P. Philippe, p. 361. Recueil des voyages qui ont servi à l'établissement de la Compagnie des Indes de Holland. Les voyages de Tavernier, tom. 3. p. 237.*

in the Mogul empire *, in Bengal †, in Siam ‡, in Pegu §, and in all the other territories of India. They are, perhaps, still more numerous in all the southern regions of Africa, excepting certain cantons which they have abandoned, because they are totally occupied by men. Elephants are faithful to their country, and never change their climate; for, though they can live in temperate regions, yet they appear not to have ever attempted to establish themselves, or even to travel into these climates. They were formerly unknown in Europe. Homer, though he mentions ivory §, seems not to have been acquainted with the animal by which that substance is produced. Alexander the Great was the first European who ever mounted an elephant.

* Voyage de Fr. Bernier au Mogul, tom. 2. p. 64.— Voyage de de Feynes à la Chine, p. 88 — Relation d'un voyage, par Hevenot, tom. 3. p. 131.— Voyage d'Edward Terri, aux Indes Orientales, p. 15.

† The country of Bengal abounds in elephants; and it is from thence they are conveyed to the other parts of India; *Voyage de Fr. Pyrard, tom. 1. p. 353.*

‡ M. de Constance informed me, that the King of Siam had twenty thousand elephants in his dominions, without reckoning those that are wild, and live in the woods and mountains, of which fifty, sixty, and even eighty, are sometimes taken at a single hunting match; *Premier voyage du P. Tachard, p. 288.*

§ Recueil des voyages de la Compagnie des Indes.— Voyage de Vander Hagen, tom. 3. p. 40. &c.

§ Herodotus is the most antient author who mentions ivory to have been a matter derived from elephants teeth; *Vid. Plin. Hist. Nat. lib. 8. cap. 3.*

phant *. Those which he took from Porus, he caused to be brought to Greece; and they were, perhaps, the same which Pyrrhus †, several years after, employed against the Romans in the Tarentine war, and with which Curius came triumphant into Rome. Annibal afterwards transported elephants from Africa, made them pass the Alps, and conducted them almost to the gates of Rome.

The Indians, from a period beyond the records of history, have employed elephants in war ‡. Among these undisciplined nations, the elephants formed their best troop; and, as long as steel weapons alone were employed, they generally decided the fate of battles. We learn from history, however, that the Greeks and Romans were soon accustomed to these monsters of war. They opened their ranks to let them pass, and directed all their weapons, not against the animals, but their conductors, who used all their efforts to turn and appease those which had separated

* *Elephantos ex Europaeis primus Alexander habuit, cum subegisset Porum; Pausanias, in Atticis.*

† Manius Curius Dentatus, victo Pyrrho, primum in triumpho elephantum duxit; *Seneca de brevitate vitae, cap. 13.*

‡ From time immemorial, the Kings of Ceylon, of Pegu, and of Aracan, have used elephants in war. Naked fabres were tied to their trunks, and on their backs were fixed small wooden castles, which contained five or six men armed with javelins, and other weapons. They contribute greatly to disorder the enemy; but they are easily terrified by the sight of fire; *Recueil des voyages de la Compagnie des Indes, tom. 7.— Voyage de Schonten, p. 32.*

separated from the rest of the troop. Now that fire has become the element of war, and the chief instrument of death, elephants, who are terrified both at the noise and flame *, would be more dangerous than useful in our combats. The Indian Kings still arm elephants in their wars; but this practice is designed more for show than utility. One advantage, however, is derived from them. Like every other military order, they serve the purpose of enslaving their equals, and are, accordingly, used in taming the wild elephants. The most powerful monarchs of India have not now above two hundred war elephants †. They keep many others for the purposes of labour, and for transporting their women in large cages covered with foliage. It is a very safe mode of riding; for the elephant never stumbles: But, to be accustomed to his brisk and swifling movements, requires time and practice. The neck is the best seat; for there
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* The elephants are afraid of fire; and, therefore, since the use of fire-arms, these animals are of no value in war. Some of those brought from Ceylon are not so dastardly; but it is only after being daily accustomed to the firing of guns, and to having crackers thrown among their feet; *Voyage de Fr. Bernier, tom. 2. p. 65.*

† Few people in India have elephants. Even their nobles have not many; and the Great Mogul keeps not above five hundred for his household, and for transporting his baggage and women, in wattled cages or baskets. I have been assured, that he has not above two hundred war elephants, part of which are employed in carrying small pieces of artillery; *Relation d'un voyage, par Thevenot, tom. 3. p. 132.*

the succussions are not so hard as on the shoulders, back, or crupper. But, for the purposes of war, or of hunting, each elephant is always mounted by several men *. The conductor rides astraddle on the neck, and the hunters or combatants sit on the other parts of the body.

In those happy regions where cannon, and other murdering engines, are imperfectly known, they still fight with elephants †. At Cochin, and other parts of Malabar ‡, horses are not used, and all the warriors who fight not on foot, are mounted on elephants. The practice is nearly the same in Tonquin §, Siam ||, and
Pegu,

* Of all animals, the elephant is the most serviceable in war; for he can easily carry four men armed with muskets, bows, or spears; *Recueil des voyages de la Campagne des Indes de Hollande; second voyage de Vander Hagen, tom. 2. p. 53.*

† When the elephants are led to war they serve two purposes; for they either carry small wooden towers, from the top of which some soldiers fight, or they have swords fixed to their trunks with iron chains, and in this manner they are let loose against the enemy, whom they assail with courage, and would unquestionably cut to pieces, if they were not repelled by spears which throw out fire; for, as elephants are terrified at fire, this artifice is employed to put them to flight; *Voyage d'Orient, par le P. Philippe, p. 367.*

‡ In Cochin, as well as in other parts of Malabar, no horses are used in war. Those who fight not on foot, are mounted on elephants, of which there are great numbers in the mountains; and these mountain elephants are the largest in India; *Relation d'un voyage, par Thevenot, tom. 3. p. 261.*

§ In the kingdom of Tonquin, the women of rank generally ride upon elephants, so very tall and massy, that they can carry, without any danger, a tower with six men in it, beside the conductor on their neck; *Il Genio vagante del conte Aurelio degli anzi, tom. 1. p. 282.*

|| See *Le Journal du voyage de l'Abbé de Choisy, p. 242.*

Pegu, where the King and great Lords always ride upon elephants. At festivals, they are preceded and followed by a numerous train of these animals, pompously adorned with pieces of shining metal, and covered with rich stuffs. Their tusks are ornamented with rings of gold and silver * ; their ears and cheeks are painted ; they are crowned with garlands ; and a number of little bells are fixed to different parts of their body. They seem to delight in rich attire ; for they are chearful and careffing in proportion to the number of their ornaments. But it is only in the southern parts of India where the elephants have acquired this degree of polish. In Africa, it is with difficulty that they can be tamed †. The Asiatics, who have been

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* We have seen elephants whose teeth were extremely large and beautiful. In some, they are more than four feet long, and garnished with rings of gold, silver, and copper ; *Premier voyage du P. Tachard, p. 273.*—The grandeur of the princes consists in the number of elephants they are able to keep, which is the chief source of their expence. The Great Mogul has several thousands of them. The King of Madura, the Lords of Narzinga and of Bijnagar, and the Kings of Naires and of Manful, have several hundreds, which they distinguish into three classes. The largest are destined for the service of the Prince. Their harness is extremely rich. They are covered with cloth embroidered with gold, and fludded with pearls. Their teeth are adorned with fine gold and silver, and sometimes with diamonds. Those of a middle size are employed in war ; and the least are used for common labour ; *Voyage du P. Vincent Marie de Ste Catherine de Sienne, chap. 11.*

† The inhabitants of Congo have not the art of taming elephants, which are very mischievous, take crocodiles with their trunks, and throw them to a great distance ; *Il Genio reg. del Conte Aurelio, tom. 2. p. 473.*

very antiently civilized, made the education of the elephant a kind of art, and have instructed and modified him according to their own manners. But, of all the African nations, the Carthaginians alone formerly trained the elephants to war; because, at the splendid period of their republic, they were perhaps the most civilized people of the East. There are now no wild elephants in all that part of Africa on this side of Mount Atlas. There are even few beyond these mountains, till we arrive at the river Senegal. But they are numerous in Senegal *, in Guiney †, in Congo ‡, on the Teeth coast §, in the

* The elephants, of which I daily saw great numbers along the banks of the river Senegal, no longer astonished me. On the fifth day of November, I walked into the woods opposite to the village of Dagana, where I found a number of their fresh tracks, which I followed near two leagues, and at last discovered five of these animals; three of them lay wallowing, like hogs, in their own soil, and the fourth was standing with its cub, eating the branches of an acacia tree, which they had broken off. By comparing the animal with the height of the tree, I perceived that its crupper was at least eleven or twelve feet high, and its tusks near three feet long. Though my presence did not disturb them, I thought it proper to retire. In pursuing my route, I met with the impressions of their feet, which measured near a foot and a half in diameter. Their dung, which resembled that of a horse, formed balls seven or eight inches thick; *Voyage au Senegal, par M. Adanson, p. 75.* See also, *Voyage de la Maire, p. 97.*

† *Voyage de Guinée, par Bosman, p. 243.*

‡ In the province of Pamba, which belongs to the kingdom of Congo, there are many elephants, on account of the number of rivers and forests with which that country abounds; *Drake's voyages.* See likewise, in the Dutch collection of East India voyages, *le voyage de Vander Broeck, tom. 2. p. 319. and Il Genio vagante del Conte Aurelio, tom. 2. p. 473.*

§ The first country where elephants are frequent is that part
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the countries of Anta *, Acra, Benin, and all the other southern territories of Africa †, as far as those which are terminated by the Cape of Good Hope; except some well inhabited provinces, such as Fida ‡, Ardra, &c. We even find them

of the coast called by the Flemish *Tand-Kust*, or *Teeth-coast*, on account of the number of elephants teeth, of which the natives make a lucrative traffic. Then towards the gold coast, and in the countries of Awiné, Jaumoré, Eguira, Abocrocé, Ancober, and Axim, many elephants are daily slain; and, the more any country is desert and uninhabited, it is proportionally more frequented by elephants and other savage animals; *Voyage de Guinée, par Guil. Bosman, p. 244.*

* The country of Anta likewise abounds in elephants; for many of them are not only killed on the main land, but they daily come down to the sea-coast, and under our forts, from which our people descry them, and make great ravages upon them. From Anta to Acra, very few are found, but in the places mentioned above, because the countries between Anta and Acra have been a long time tolerably peopled, except that of Fetu, which, for five or six years, has been almost deserted, and the elephants, for that reason, have taken possession of it. On the coast of Acra, vast numbers are annually slain; because in these districts there is much desert and uninhabited land. . . . In the country of Benin, as well as on the Rio de Calbari, Camerones, and other adjacent rivers and countries, these animals are so numerous, that it is difficult to conceive how the natives can or dare live in them; *Idem, p. 246.*

† Below the Bay of St Helen's, the country is divided into two portions by the Elephant river, which has received its name from the elephants, who love running waters, and are found in great numbers upon their banks; *Description du Cap de Bonne Esperance, par Kolbe, tom. 1. p. 114. et tom. 3 p. 12.*

‡ There are no elephants in Ardra, nor in Fida, though, in my time, one was killed there. But the Negroes affirm, that such an event had not happened for sixty years before. I, therefore, imagine that this animal had wandered thither from some other country; *Voyage de Guinée, par Bosman, p. 245.*

them in Abyſſinia *, in Æthiopia †, in Nigritia ‡, upon the eaſtern coaſts, and in all the interior parts of Africa. They likewiſe exiſt in the large iſlands of India and Africa, as Madagaſcar §, Java ||, and as far as the Philippine iſlands **.

After comparing the teſtimonies of travellers and hiſtorians, it appears that elephants are more numerous

* See *voyage historique d'Abyſſinie* du P. Lobo, tom. 1. p. 57. where troops of elephants are ſaid to be found in Abyſſinia.

† The Æthiopians have elephants in their country; but they are ſmaller than thoſe of India; and though their teeth are hollow, and of leſs value, they conſtitute a conſiderable article of trade; *Voyage de Paul Lucas*, tom. 3. p. 186.—There are many elephants in Æthiopia, and in the country of Preſter John, beyond the iſland of Moſambique, where the Caffres or Negroes kill a great number for the ſake of their teeth; *Recueil des voyages de la Compagnie des Indes de Hollande*, tom. 1. p. 413. See alſo *L'Afrique de Marmol*, tom. 1. p. 58.

‡ *Elephas magna copia in ſilvis Nigritarum regionis invenitur. Solent magno numero conſertim incedere, &c. Leonis Afric. Deſcript. Africæ*, tom. 2. p. 744. et 745.

§ In the iſland of Madagaſcar, elephants are ſuppoſed to be more numerous than in any other country. Madagaſcar, and an adjacent iſland called *Cuzibet*, furniſh ſuch vaſt quantities of ivory, that, in the opinion of merchants, the reſt of the world does not produce an equal number of elephants teeth; *Deſcript. de l'Inde Orient. par Marc Paul*, p. 114.

|| The animals found in the iſland of Java, are 1. elephants, which are tamed and hired out for labour; *Recueil des voyages de la Compagnie des Indes de Hollande*, tom. 1. p. 411.—At Tuban the King's elephants are each placed under a particular ſhade ſupported by four pillars; and, in the middle of the area, which is likewiſe covered, there is a large ſtake to which the elephant is fixed by a chain; *Idem*, tom. 1. p. 526.

** Mandaſar is the only Philippine iſland which produces elephants; and, as the natives do not tame theſe animals, as at Siam and Cambaya, they are prodigiouſly numerous; *Voyage autour du Monde, par Gemelli Careri*, tom. 5. p. 209.

numerous and common in Africa than in Asia. They are also less suspicious, and retire not to such distant solitudes. They seem to know the unskilfulness and debility of the men who inhabit this part of the world; for they daily approach the villages without discovering any apprehensions *. They treat the Negroes with that natural and supercilious indifference which they entertain for all animals. They regard not man as a powerful or formidable being, but as a crafty creature, who knows only how to lay snares in their way, but who dare not attack them face to face, and is ignorant of the art of reducing them to slavery. It is by this art alone, which has been long known in the Eastern nations, that the number of these animals has been diminished. The wild elephants, which these people render domestic, become by captivity so many voluntary eunuchs, in whom the sources of generation are daily dried up. But, in Africa, where the elephants are all free, the species is supported, and might even increase, though more of them were destroyed; because every individual is constantly labouring to repair the waste. I perceive no other cause to which this difference of number can be ascribed; for it appears, from every consideration, that the

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* The elephants often pass the night in the villages, and are so little afraid of frequented places, that, instead of turning when they perceive the houses of the Negroes, they march straight forward, and overturn them like nut-shells; *Voyage de la Maire, p. 98.*

south of India and the East of Africa, are the countries most congenial to the nature of the elephant. He is there much larger and stronger than in Guiney, or any other western region of Africa. He dreads excessive heat, and never inhabits the burning sands of the desert. Neither is the species so numerous in the country of the Negroes, as along the rivers; and they are never found in the mountainous parts of Africa. But, in India, the strongest and most courageous of the species, and which have the largest tusks, are called *Mountain Elephants*: They inhabit the elevated parts of the country, where, the air being more temperate, the waters less impure, and the food more wholesome, they acquire all the perfections of which their nature is capable.

In general, the elephants of Asia exceed, in size, strength, &c. those of Africa; and those of Ceylon, in particular, are superior to all those of Asia, not only in magnitude, but in courage and intelligence. These qualities they perhaps derive from a more perfect education. However this may be, all travellers have celebrated the elephants of this island*, where the surface
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* The elephants of Ceylon are preferred to all others, because they have most courage. . . . The Indians say, that all the other elephants respect those of Ceylon; *Relation d'un voyage par Thevenot, p. 261.*—The elephants of Ceylon are the boldest of the species; *Voyage de Bernier, tom. 2. p. 65.*—The best and most intelligent elephants come from the island of Ceylon; *Recueil*

of the earth is variegated with mountains, which are more elevated in proportion as they advance toward the centre of the island, and where the heat, though great, is not so excessive as in Senegal, Guiney, and the other western parts of Africa. The antients, who knew nothing of this quarter of the world, except the territories situated between Mount Atlas and the Mediterranean, had remarked, that the Lybian elephants were much smaller than those of India *. There are now no elephants in that part of Africa; which proves what was alledged under the article *Lion* †, that men are at present more numerous there than they were in the days of the Carthaginians. The elephants have retired in proportion to the disturbance they have met with from the human species. But, in travelling through the climates of Africa, they have not changed their nature; for the elephants of Senegal, Guiney, &c. are still much smaller than those of India.

The strength of these animals is proportioned to their magnitude. The Indian elephants carry
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cueil des voyages, tom. 1. p. 413.; tom. 2. p. 256.; tom. 4. p. 363.
—In Ceylon the elephants are numerous, and more generous and noble than any others. . . . All other elephants revere those of Ceylon, &c. *Voyage d'Orient du P. Philippe, p. 130. et 367.*

* *Indicum (elephantum) Afri pavent, nec contueri audent; nam et major Indicis magnitudo est; Plin. Hist. nat. lib. 8. cap. 9.*

† See above, vol. 5. p. 66.

with ease three or four thousand weight *: The smaller, or those of Africa, can easily raise with their trunk a weight of two hundred pounds, and place it on their own shoulders †. They draw up into their trunks large quantities of water, which they squirt into the air, or all around, to the distance of several fathoms. They can carry a weight of above a thousand pounds on their tusks. They use their trunk for breaking branches, and their tusks for tearing up trees. The greatness of their strength may be still farther conceived from the quickness of their movements, compared with the magnitude of their bodies. At their ordinary step, they cut as much ground as a horse at a gentle trot; and they run as fast as a horse can gallop: But, in a state of liberty, they never run, unless when enraged or terrified. Domestic elephants are generally walked, and they perform easily, and without fatigue, a journey of fifteen or twenty leagues in a day; and, when pushed, they can travel thirty or forty leagues a-day ‡. Their tread is heard at a great distance, and they may be easily followed by the tracks of their feet, which,

* Relation d'un voyage, par Thevenot, p. 261.

† The elephant raises with his trunk a weight of two hundred pounds, and places it on his own shoulders. . . . He draws up into his trunk one hundred and fifty pounds of water, which he squirts to a considerable height in the air; *L'Afrique de Marmol. tom. 1. p. 58.*

‡ When an elephant is pushed, he can perform, in one day, as much as a man generally does in six; *L'Afrique de Marmol. tom. 1. p. 58.*

which, in soft ground, measure fifteen or eighteen inches in diameter.

A domestic elephant performs more work than perhaps six horses *; but he requires from his master much care, and a great deal of good victuals, which cost about four francs, or a hundred pence a day †. He is generally fed with rice, raw or boiled, and mixed with water. To keep him in full vigour, he is said to require daily a hundred pounds of rice, beside fresh herbage to cool him; for he is subject to be over-heated, and must be led to the water twice or thrice a day for the benefit of bathing. He easily learns to bathe himself. He takes the water up in his trunk, carries it to his mouth, drinks part of it, and, by elevating his trunk, allows the remainder to run over every part of his body. To

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give

* The price of elephants is very high. They are sometimes sold from a thousand pagodas of gold to fifteen thousand roupees, that is, from nine or ten thousand livres to thirty thousand; *Notes de M. de Buffon*.—At Ceylon, an elephant is worth, at least, eight thousand pardaons; and, when very large, he brings twelve, and even fifteen thousand pardaons; *Hist de l'Isle de Ceylon, par Ribeyro, p. 144*.

† The food of an elephant costs about half a pistole each day; *Relation d'un voyage par Thevenot, p. 261*.—Tamed elephants are very delicate in their feeding. They require rice well boiled, and seasoned with butter and sugar, which is given to them in large balls. They devour daily a hundred pounds of rice, beside leaves of trees, particularly those of the Indian fig, called *bananas* or *plantane*, which are given them by way of refreshment; *Voyage de Pyrard, tom. 2. p. 367*.—See also, *Voyages de la Boullaye-le-Gouz, p. 250*;—and *Recueil des voyages de la Compagnie des Indes de Hollande, tom. 1. p. 473*.

give an idea of the labour he performs, it is sufficient to remark, that all the tuns, sacks, and bales, transported from one place to another in India, are carried by elephants; that they carry burdens on their bodies, their necks, their tusks, and even in their mouths, by giving them the end of a rope, which they hold fast with their teeth; that, uniting sagacity to strength, they never break or injure any thing committed to their charge; that, from the margins of the waters, they put these bundles into boats without wetting them, laying them down gently, and arranging them where they ought to be placed; that, when disposed in the places where their masters direct, they try with their trunk whether the goods are properly stowed; and, if a tun or cask rolls, they go, of their own accord, in quest of stones to prop and render it firm.

When the elephant is properly managed, though in captivity, he lives a long time; and, it is probable, that, in a state of liberty, his life is still longer. Some authors affirm, that he lives four or five hundred years *, others two or three hundred †, and others a hundred and twenty,

* Onesimus, according to Strabo, *lib. 15.* says, that elephants live five hundred years.—Philostratus, *Vit. Apoll. lib. 16.* relates, that the elephant Ajax, which fought for Porus against Alexander the Great, lived four hundred years after that battle.—Juba, King of Mauritania, asserts, that an elephant was taken in Mount Atlas, which was known to have been in a battle four hundred years before.

† *Elephantum alii annos ducentos vivere aiunt, alii trecentos;*

twenty, a hundred and thirty, and a hundred and forty *. I believe, that a medium between the two extremes is the truth; and that, if captive elephants live a hundred and twenty, or a hundred and thirty years, those which are free, and enjoy all the conveniencies and rights of Nature, ought to exist at least two hundred. Besides, if they go two years with young, and require thirty before they obtain their full growth, we may, with still more certainty, conclude, that their life extends beyond the period we have affixed. But captivity abridges their existence less than the injuries arising from change of climate. Whatever care is bestowed on him, the elephant lives not long in temperate, and still shorter in cold countries. That which the King of Portugal sent to Louis XIV. in

centos; *Arifi. Hist. anim. lib. 8. cap. 9.*—*Elephas ut longissimum annos circiter ducentos vivit; Arrian. in Indicis.*—I saw a white elephant, which was destined to be the successor of that in the palace, and was said to be near three hundred years old; *Premier voyage de Siam du p. Tachard, p. 273.*

* The elephants grow during one half of their existence, and generally live a hundred and fifty years; *Drake's voyage, p. 104.*—The female elephants go two years with young, and live a hundred and fifty years; *Recueil des voyages de la Compagnie des Indes de Hollande, tom. 7. p. 31.*—Notwithstanding all the inquiries I have made, I could never learn exactly how long the elephant lives. The keepers of these animals can give no other information, than that such an elephant was in the possession of their father, grandfather, and great-grandfather; and, by computing the length of time which these people lived, it is sometimes found to amount to a hundred and twenty, or a hundred and thirty years; *Voyage de Tavernier, tom. 3. p. 242.*

in 1668 *, and which was then only four years old, died in the month of January 1681, at the age of seventeen, and lived at Versailles only thirteen years, though he was fed plentifully, and managed with the greatest attention. He had daily eighty pounds of bread, twelve pints of wine, and two pails of pottage, mixed with four or five pounds of bread; and, every second day, in place of pottage, he had two pails of boiled rice, without reckoning what was given him by visitors. He had, besides, a sheaf of corn every day for his amusement; for, after eating the ears, he made a kind of whip of the straw, with which he drove away the flies. He delighted in breaking the straw into small morsels, which he did very dexterously with his trunk; and, as he was daily led out to walk, he pulled and eat the grass. The elephant which was lately at Naples, though the heat is greater there than in France, lived but a few years. Those which were sent to Petersburg, though well sheltered, clothed, and warmed with stoves, all died successively. Hence we may conclude, that this animal is incapable of subsisting, and far less can he multiply, in any part of Europe. But I am astonished that the Portuguese, who first knew the value and utility of elephants in the East Indies, did not transport them to the warm climate of Brasil, where, by leaving them at liberty, they would probably

* Mem. pour servir à l'histoire des animaux, part. 3. p. 101. et 127.

probably have multiplied. The elephants are generally ash-coloured, or blackish. White elephants, as formerly remarked, are extremely rare *; and authors are quoted who have seen white and red elephants in different parts of India, where they are highly valued †. Besides, these

* Some persons who lived long in Pondicherry, seem to doubt the existence of white and red elephants; for they affirm, that, in this part of India, at least, the elephants are all black. It is true, they remark, that, when these animals are long neglected to be washed, the dust which adheres to their oily and naked skin gives them the appearance of a dirty gray colour; but, when washed with water, they become as black as formerly. I believe that black is the natural colour of elephants, and none of any other colour are to be found in those parts of India which these people have had an opportunity of seeing. But, at the same time, it seems not to admit of a doubt, that, in Ceylon, Siam, Pegu, Cambaya, &c. some white and red elephants are accidentally to be met with. For ocular witnesses of this fact, we might quote le Chevalier Chaumont, l'Abbé de Choisy, le P. Tachard, Vander Hagen, Joost Schuten, Thevenot, Ogilvy, and other travellers of less note. Hortensius, who has collected, in his *Elephantographia*, a great number of facts from different voyages, assures us, that the white elephant has not only a white skin, but that the hair of its tail is also white. To these testimonies, we might add the authority of the antients. Ælian, lib. 3. cap. 46. mentions a small white elephant in India, and seems to insinuate that the mother was black. This variety in the colour of elephants, though rare, is certain, and very antient. It has, perhaps, proceeded from their domestic condition, to which the Indians have been long accustomed to reduce these animals.

† In the procession of the King of Pegu, two red elephants are led before, harnessed with silk and gold stuffs, which are followed by four white elephants, harnessed in a similar manner, with the addition of precious stones, and the tusks covered

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these varieties are so uncommon, that, instead of considering them as distinct races, they ought to be regarded as qualities purely individual and accidental; for, if it were otherwise, we would know the countries of white, red, and black elephants, in the same manner as we know the climates of white, red, and black men. ‘In India,’ says P. Vincent Marie, ‘there are three kinds of elephants, the white, which are the largest, the most gentle, and peaceable, are adored as gods by several nations: The red, such as those of Ceylon, though the smallest in size, are the most valorous, the strongest, and the best for the purposes of war; the other elephants, whether from natural inclination, or from recognising something superior, pay great respect to those of Ceylon: The black is the third kind, and they are the most common, and in most estimation *.’ This is the only author who seems to hint, that Ceylon is the peculiar climate of red elephants; for other travellers make no mention of such a fact. He likewise asserts, that the Ceylon elephants are the smallest. Thevenot says the same thing in his voyage, p. 260. But other writers relate the reverse. In fine, P. Vincent is the only author who says, that

ed with rubies; *Voyage de la Compagnie des Indes de Hollande*, tom. 3. p. 60.

* *Voyage du P. Fr. Vincent-Marie de St Catherine de Sienne*, chap. 9. translated from the Italian by M. le Marquis de Montmirail,

that the white elephants are the largest. P. Tachard, on the contrary, assures us, that the King of Siam's white elephant was diminutive, though very old. After comparing the testimonies of travellers with regard to the magnitude of elephants in different climates, to me it appears, that the smallest are those of the west and north of Africa, and that the ancients, who knew only the northern part of Africa, were right in their general assertion, that the Indian elephants were much larger than those of Africa. But, in the eastern regions of this quarter of the world, of which the ancients were ignorant, the elephants are as large, and perhaps larger than those of India. In this last region, it appears, that the elephants of Siam, Pegu, &c. are larger than those of Ceylon; which, however, from the unanimous testimony of travellers, have more courage and intelligence.

Having thus marked the principal facts with regard to the species, let us next examine, in detail, the properties of the individual, his senses, movements, size, strength, address, sagacity, &c. In proportion to the magnitude of his body, the eyes of the elephant are very small; but they are lively and brilliant: What distinguishes them from the eyes of all other animals, is a pathetic expression of sentiment, and an almost rational management of all their actions*. He turns them slowly and with mildness towards his

* *Elephantographia Christophori Petri ab Hartenfels.*

his master. When he speaks, the animal regards him with an eye of friendship and attention, and his penetrating aspect is conspicuous when he wants to anticipate the inclination of his governour. He seems to reflect, to deliberate, to think, and never determines till he has several times examined, without passion or precipitation, the signs which he ought to obey. The dog, whose eyes are very expressive, is too prompt and vivacious to allow us to distinguish with ease the successive shades of his sensations. But, as the elephant is naturally grave and moderate, we read in his eyes, whose movements are slow, the order and succession of his internal affections*.

His ear is very good; and the external organ of hearing, like that of smelling, is more remarkable in the elephant than in any other animal. His ears are very large, and much longer, even in proportion to his body, than those of the ass. They lie flat on the head, like the human ears. They are commonly pendulous; but he can raise and move them with such facility, that he uses them to defend his eyes from dust and flies †. He delights in the sound of musical

* The eyes of the elephant are, proportionally, exceedingly small; but they are very active and lively, and they uniformly move in such a manner, as gives him the air of thought and reflection; *Voyage au Indes Orientales du P. Fr. Vincent Marie de St Catherine de Sienne*, p. 396.

† The elephant has very large ears. . . . He perpetually moves them with much gravity, and they defend his eyes from all kinds of insects; *Id. ibid.* See also *Les Memoires pour servir à l'histoire des Animaux*, part. 3. p. 107.

musical instruments, and moves in cadence to the trumpet and tabour. His sense of smelling is exquisite, and he is passionately fond of perfumes of every kind, and especially of odoriferous flowers, which he gathers one by one, makes nosegays of them, and, after gratifying his nose, conveys them to his mouth. The flowers of the orange constitute one of his most delicious morsels. With his trunk he robs an orange tree of all its verdure, eating the fruit, the flowers, the leaves, and even the small branches *. In the meadows, he selects the most odoriferous plants ; and, in the woods, he prefers the cocoa, the banana, the palm, and the sago trees ; and, as these trees are soft and tender, he eats not only the leaves and fruit, but even the branches, the trunk, and the roots ; for when they are unable to pull up the trees with their trunk, they always succeed by using their tusks.

With regard to the sense of touching, it is chiefly confined to the trunk ; but, in this member, it is as delicate and distinct as in the human hand. The trunk is composed of membranes, nerves, and muscles ; it is both an organ of feeling and of motion. The animal cannot only move and bend it, but he can contract, lengthen, and turn it on all sides. The extremity of the trunk terminates in a protuberance

* Voyage de Guinée, par Bosman, p. 243.

rance * which stretches out on the upper side in the form of a finger, by means of which the elephant performs all that we do with our fingers. He lifts from the ground the smallest piece of money ; he selects the herbs and flowers, and picks them up one by one ; he unties the knots of ropes, opens and shuts gates, by turning the keys, or pushing back the bolts. He learns to trace regular characters with an instrument as small as a quill †. It cannot be denied that the elephant's hand has several advantages over ours. It is equally flexible, and as dexterous in touching or laying hold of objects. These operations are performed by means of the appendix or finger, situated on the superior part of the border that surrounds the extremity of the trunk, in the middle of which there is a concavity in the form of a cup, and in the bottom of the cup are the apertures of the two common canals of smelling and of respiration. The elephant, therefore, has his nose in his hand, and is enabled to combine the power of his lungs with the action of his fingers, and to attract fluids.

* Mem. pour servir a l'histoire des animaux, part. 3. p. 108. & 140.

† Mutianus ter Consul auctor est, aliquem ex his et litterarum ductus Graecarum didicisse, solitumque praescribere ejus linguae verbis : Ipse ego haec scripsi, &c. ; *Plin. Hist. nat. lib. 8. cap. 3.*——Ego verò ipse elephantum in tabula litteras Latinas promuscide atque ordine scribentem vidi : Verùm tamen docentis manus subjiciebatur ad litterarum ductum et figuram eum instituens ; dejectis autem et intentis oculis erat cum scriberet ; doctos et litterarum gnaros animalium oculos esse dixisses ; *Ælian. de nat. Anim. lib. 2. cap. 11,*

fluids by a strong suction, or to raise heavy bodies by applying to them the edge of his trunk, and making a vacuum within by a vigorous inspiration.

Hence delicacy of feeling, acuteness of smelling, facility of movement, and the power of suction, are united at the extremity of the elephant's nose. Of all the instruments which Nature has so liberally bestowed on her most favourite productions, the trunk of the elephant is perhaps the most complete and the most admirable. It is not only an organic instrument, but a triple sense, whose united functions are at once the cause, and produce the effects of that sagacity and those remarkable talents which distinguish the elephant, and exalt him above all other quadrupeds. He is not so subject, as other animals, to errors of vision; because he quickly rectifies them by the sense of touching; and, by using his trunk, as a long arm, for the purpose of touching remote objects, he acquires, like man, clear ideas of distances. But the other animals, excepting the monkeys and others who have a kind of arms and hands, cannot acquire ideas of distance but by traversing space with their bodies. Of all the senses, that of touching has the greatest relation to intelligence. The delicacy of touching, the flexibility of the trunk, the power of suction, the sense of smelling, and the length of the arm, give the ideas of the substance of bodies, of their external form, of their weight,

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of their salutary or noxious qualities, and of their distance. Thus, by the same members, and by one simultaneous act, the elephant feels, perceives, and judges of several things at one time. Now a multiplied sensation is equivalent, in some measure, to reflection: Though this animal, therefore, is, like all others, deprived of the faculty of reflecting, as his sensations are combined in the same organ, contemporary, and not separated from each other, it is not surprising that he should have ideas of his own, and readily acquire those we wish to communicate to him. The memory of the elephant should be more perfect than that of any other animal; for memory depends greatly on the circumstances of actions. No solitary sensation, however lively, can leave any distinct or durable impression; but several combined and contemporary sensations make deep and lasting impressions; so that, if the elephant cannot recollect an idea by touch alone, the adjacent and accessory sensations of smelling, and the power of suction, which have acted at the same time, aids him in recalling the remembrance of it. In man, the best mode of rendering the memory faithful, is to employ successively all our senses in examining an object; and it is owing to the neglect of habituating ourselves to the combined use of our senses, that we forget most things we ought to remember.

But,

But, though the elephant has more memory and intelligence than any other animal, his brain is proportionally smaller than that of most quadrupeds*. I mention this fact as a proof that the brain is not the seat of sensation, the *sensorium commune*, which, on the contrary, resides in the nerves of the senses, and in the membranes of the head. Thus the nerves distributed upon the trunk of the elephant, are so numerous as to be equivalent to all those bestowed on the rest of the body. It is, therefore, by virtue of this singular combination of senses and faculties in the trunk, that the elephant excels all other animals in sagacity, notwithstanding the enormity of his mass, and the disproportion of his form; for the elephant is, at the same time, a miracle of intelligence and a monster of matter. The thickness and inflexibility of his body; the shortness and stiffness of his neck; the smallness and deformity of his head; the excessive largeness of his ears and nose; the minuteness of his eyes, mouth, genitals, and tail; his straight, clumsy, and almost inflexible limbs; the shortness and smallness of his feet †, which are hardly apparent; the thick-
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* Mem. pour servir à l'hist. des animaux, part. 3. p. 135.

† The feet of every animal is proportionally larger than that of man, excepting the elephant, which is still smaller. —The feet were so small as to be hardly perceptible; because the toes are covered with the skin of the legs, which hangs down on all sides as far as the ground, and appears like the trunk of a tree cut across; *Mem. pour servir à l'hist. des animaux*, p. 102.

ness and callosity of his skin: All these deformities are the more conspicuous and disagreeable to the eye, because they are modelled on a large scale, and most of them peculiar to the elephant alone; for in no animal are the head, the feet, the nose, the ears, and the tusks, situated like those of the elephant.

From this strange conformation, the animal is subjected to several inconveniencies. He moves his head with difficulty, and cannot turn himself, in order to go back, without making a circuit. The hunters who attack him behind, or on the flanks, avoid the effects of his vengeance by circular movements; and they have time to renew their blows while he is turning himself against them. His legs, the rigidity of which is not so great as that of his neck and body, bend but slowly, and with difficulty. They are strongly articulated to the thighs. His knee is like that of man *, and his foot is equally low; but the latter has no extent, spring, or force, and the former is hard and rigid. As long, however, as the elephant is young and in health, he bends his knees to lie down, and to allow himself to be mounted, or charged with a load. But, when old or sick, this movement becomes so laborious, that

* His knee is situated, like that of man, in the middle between the belly and the foot; so that the elephant's leg is similar to a man's, both with regard to the position of the knee and the smallness of the foot, the extent of which, from the heel to the toes, is very small; *Mém. pour servir à l'hist. des animaux*, part. 3. p. 102.

that he choofes rather to fleep on his feet ; and, if forced to lie down *, machines are neceffary to raife him. His tusks, which, with age, become enormously heavy, and not being placed, like the horns of other animals, in a vertical pofition, form two long levers, which, by their almoft horizontal direktion, fatigue the head prodigioufly, and make it hang down ; fo that the animal is fometimes obliged to make holes in the wall of his lodge to fupport them, and relieve him of their weight †. He has the difadvantage of having the organ of fmelling very diftant from that of tafting, and the inconvenience of not being able to feize any thing on the ground with his mouth, becaufe his neck is too ftiff and too fhort to allow his head to reach the earth. He is, therefore, obliged to lay hold of his food, and even of his drink, with his nofe, and then to convey it, not only to the entrance of his mouth, but as far as the throat ; and, when the trunk is filled with water, he thrufts the end of it

* We learned from the people who had the charge of the elephant at Verfailles, formerly mentioned, that, the firft eight years he lived, he lay down and rofe with great facility ; and that, during the laft five years, he did not lie down to fleep, but leaned againft the wall of his apartment ; fo that, if he had happened to lie down when fick, it would have been neceffary to pierce the floor above, in order to raife him with engines ; *Mem. pour fervir à l'hift. des animaux, p. 104.*

† We faw where the elephant had employed his tusks in marking holes in a ftone-pillar, which projected from the wall of his lodge, and thefe holes fupported him when fleeping, his tusks being put into them ; *Id. p. 102.*

it to the very root of the tongue *, seemingly with the intention of pushing back the epiglottis to prevent the water, which rushes out with impetuosity, from entering into the larynx ; for he forces out the water by the same air which he employed to suck it up, and it rushes out of the trunk with noise, and precipitantly enters the gullet. The tongue, the mouth, and the lips, are of no use to him, as in other animals, to suck or lap his drink.

From this description, the singular consequence results, that the young elephant must suck with its nose, and afterwards convey the milk to its gullet. We are told, however, by the ancients, that he sucks with his mouth, and not with his trunk †. But there is reason to believe that they never were witnesses of the fact, and that they reasoned solely from the analogy of other animals. If the young elephant ever acquired the habit of sucking with his mouth, why should he lose it during the rest of his life? Why does he never employ the mouth to suck in water? Why does he uniformly employ a double action, when a single one would answer the purpose? Why does he never seize any object with his mouth, except

* Mem. pour servir à l'hist. des animaux, part 3. p. 109.

† Pullus editus ore fugit, non promuscide, et statim cum natus est cernit et ambulat ; *Arist. hist. anim. lib. 6. cap. 27.*—Anniculo quidem vitulo aequalem pullum edit elephantus, qui statim, ut natus est, ore fugit ; *Ælian. de nat. anim. lib. 6. cap. 3.*

cept what is thrown into it when open *? It is, therefore, extremely probable, that the young elephant sucks only with his trunk. This presumption is not only proved by the following facts, but is founded on a stronger analogy than that which gave rise to the opinion of the ancients. We formerly remarked, that, in general, animals, at the moment of birth, can perceive the presence of the aliment they want by no other sense but that of smelling. The ear can have no effect; neither can the eye; for most animals are blind when they begin to suck. The sense of touching can only convey a vague and indiscriminate notion of all the parts of the mother's body, or, rather, it can indicate nothing relative to appetite. But the sense of smelling is alone sufficient for this purpose: It is not only a species of taste, but a fore-taste, which precedes, accompanies, and determines the other kind. The elephant, therefore, like all other animals, perceives, by this fore-taste, the presence of his aliment: And, as the seat of smelling is united with the power of suction at the extremity of the trunk, he applies it to the teat, sucks the milk, and conveys it to the mouth to satisfy his appetite. Besides, the two paps, as in woman, are situated on the breast, and, the teats being very small in proportion to the size of the young one's mouth,

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whose

* Voyez les Memoires pour servir à l'hist. des Animaux, part. 3. p. 109. et 110.

whose neck also has little flexibility, the mother must have lain on her back or side to enable her young to lay hold of the teat with its mouth; and, even in this situation, it would have been difficult to extract the milk, on account of the enormous disproportion between the largeness of the mouth and the smallness of the teat. But the margin of the trunk, which the animal contracts at pleasure, is easily accommodated to the teat, and enables the young elephant to suck the mother either when she stands or lies on her side. Thus every circumstance concurs in invalidating the notion of the antients on this subject; for none of them, nor even any of the moderns, alledge that they ever saw the elephant sucking; and I have no hesitation in predicting, that, whenever such an observation is made, it will appear, that he sucks not with his mouth, but with his nose. I likewise imagine that the antients are deceived, when they tell us, that the elephants copulate like other quadrupeds, the female only lowering her crupper*, for the more easy reception of the male. The situation of the parts seems to render this mode of junction impossible. The female elephant has not, like other quadrupeds, the orifice of the vagina adjacent to the anus; for it is situated nearly in the middle of the belly, about two and a half, or three

* Subfidit foemina, clunibusque submissis, et insidit pedibus ac innititur; mas superveniens comprimit, atque ita munere venereo fungitur; *Arist. hist. anim. lib. 5. cap. 2.*

three feet distant from the anus*. On the other hand, the male organ is by no means proportioned to the magnitude of his body, nor to so long an interval, which, in the situation supposed, would preclude the practicability of his approach. Naturalists as well as travellers agree in affirming, that the male organ of the elephant exceeds not, either in length or diameter †, that of a horse. It is, therefore, impossible that he should attain his end in the ordinary position of quadrupeds. The female must necessarily lie on her back. De Feynes‡ and Tavernier|| positively assert, and the situation of the parts confirms their evidence, that these animals cannot intermix in any other manner §. They require, therefore,

* Mem. pour servir à l'hist. des animaux, part. 3. p. 132.

† *Elephantus genitale equo simile habet, sed parvum nec pro corporis magnitudine. Testes idem non foris conspicuos sed intus circa renes conditos habet; Arist. hist. anim. lib. 2. cap. 1. —L' Afrique d'Ogilby, p. 13. et 14.*

‡ When these animals couple, the female lies on her back; and, after the operation, the male raises the female with his trunk; *Voyage par terre à la Chine du S. de Feynes, p. 90.*

|| Though the elephants have no intercourse in a domestic state; yet they frequently come in season. It is remarkable that the female, on these occasions, collects all kinds of herbs and leaves, of which she makes a bed elevated four or five feet above the ground, and, contrary to the nature of all other quadrupeds, lies down on her back, and solicits the male by her cries; *Voyage de Tavernier, tom. 3. p. 240.*

§ This article was written before I saw M. de Buffon's Notes concerning the elephant; and his evidence fully confirms the fact, which the situation of the parts had suggested. 'The elephant,' says M. de Buffon, 'copulate in a singular manner.

' The

therefore, more time and conveniency for this operation than other quadrupeds; and it is, perhaps, for this reason, that they never copulate but when they enjoy full liberty, and have every necessary article at their command. The female must not only consent, but solicit the male by a position which she never assumes, unless when she thinks herself in perfect retirement *. May we not, therefore, conclude, that modesty is a physical virtue which exists in the brute creation? It is, at least, like softness, moderation, and temperance, a general and beautiful attribute of the female sex.

Thus the elephant neither sucks, generates, eats, nor drinks like other animals. The sound of his voice is likewise extremely singular. If we believe the antients, the elephant utters two kinds of cries, one by the trunk, which, from its sinuosities and inflexions, is rough and long, like the sound of a trumpet; and another by the mouth, which is interrupted by short pauses and harsh sighs †. This fact, which was advanced by

* The female lies down on her back. The male rests on his fore legs, bends down those behind, and touches not the female any farther than is necessary to effect his purpose.

* Pudore nunquam nisi in abdito coeunt; *Plin. hist. nat. lib. 8. cap. 5.*—The elephants couple very rarely; and, when they do, it is with such secrecy, and in places so solitary, that they have never been observed by any person. When in a domestic state, they never produce; *Voyage aux Indes Orientales du P. Vincent-Marie de Sainte Catherine de Sienne, chap. 11. p. 396.*

† *Elephantus citra nares ore ipso vocem edit spirabundam, quem-*

by Aristotle, and afterwards repeated by naturalists and travellers, is probably false, or, at least, not exactly related. M. de Buffon denies that the elephant utters any cry through the trunk. However, as a man, by shutting his mouth close, can make a sound through his nose, the elephant, whose nose is so large, may produce sounds in the same manner. But, however this may be, the cry of the elephant is heard at the distance of more than a league, and yet it excites not terror, like the roaring of the lion or tiger.

The elephant is still more singular in the structure of his feet, and the texture of his skin, which last is not, like other quadrupeds, covered with hair, but totally bare, as if it were shaven. There are only a few bristles in the fissures of the skin, and these bristles are thinly scattered over the body, but very numerous on the cilia and back of the head *, in the auditory passages, and the insides of the thighs and legs. In the epidermis, or scarf skin, there are two kinds of wrinkles, the one raised and the other depressed, which give it the appearance of being cut into fissures, resembling pretty nearly the bark of an old oak tree. In man and the other animals,

the

quemadmodum cum homo simul et spiritum reddit et loquitur, at per nares simile tubarum raucitati sonat; *Arist. hist. anim. lib. 4. cap. 9.*—Citra nares ore ipso sternutamento similem edit sonum; per nares autem tubarum raucitati; *Plin. hist. nat. lib. 8.*

* *Memoires pour servir à l'Histoire des animaux, part. 3. p. 113.*

the epidermis adheres throughout to the skin; but, in the elephant, it is only attached by some points of infertion, like two pieces of cloth stitched together. This epidermis is naturally dry, and very subject to grow thick. It often acquires the thickness of three or four lines, by the successive drying of different layers which are produced one above another. It is this thickening of the scarf skin which gives rise to the *elephantiasis* or *dry leprosy*, to which man, whose skin is naked like that of the elephant, is sometimes subject. This disease is very common to the elephant; and the Indians, to prevent it, rub him frequently with oil, and bathe him with water, with a view to preserve the skin clean and flexible. The skin, where it is not callous, is extremely sensible. In the fissures, and other places where it is neither dry nor hardened, the elephant feels the stinging of flies in such a lively manner, that he not only employs his natural movements, but even the resources of his intelligence, to get rid of them. He strikes them with his tail, his ears, and his trunk. He contracts his skin, and crushes them between its wrinkles. He drives them off with branches of trees, or handfuls of long straw. When all these artifices are unsuccessful, he collects dust with his trunk, and covers all the sensible parts of his skin with it. He has been observed pulverizing himself in this manner several times in a day; and always at the most proper season, namely,

after

after bathing *. The use of water is as necessary to these animals as air. When free, they never quit the banks of rivers, and often go into the water till it reaches their belly, and in this situation they daily spend several hours. In India, where the elephants are treated in the manner that best corresponds with their nature and temperament, they are carefully bathed, and allowed time and every possible conveniency for bathing themselves †. Their skin is cleaned by rubbing

* I was informed that the elephant at Versailles always rolled in the dust after bathing, which he did as often as he was allowed; and it was observed, that he threw dust upon all the places which had been missed when he rolled himself, and that he drove off the flies with handfuls of straw, or by throwing dust with his trunk on the places where he felt himself stung, there being nothing which the flies avoid so much as falling dust; *Mem. pour servir à l'hist. des animaux, part. 3. p. 117.*

† About eight or nine o'clock before noon, we went to the river to see the elephants belonging to the King and the Nobles bathed. The animal goes into the water till it reaches his belly, and, lying down on one side, fills his trunk several times, and throws the water upon the parts which are uncovered. The master then rubs off, with a kind of pumice stone, all the dirt that has been collected on the creature's skin. Some authors tell us, that, when the elephant lies down, he is unable to raise himself. But this assertion is not founded in truth; for the master, after rubbing one side, desires the animal to turn to the other, which he does very quickly; and, after both sides are well curried, he comes out of the river, and stands some time on the bank till he dries. The master then brings a pot of red or yellow paint, and draws lines on the elephant's face, round the eyes, upon the breast and rump. He is next rubbed over with oil to strengthen his nerves; *Voyage de Tavernier, tom. 3. p. 264.*

rubbing it with a pumice stone ; and then they are anointed with perfumed oils, and painted with various colours.

The structure of the elephant's feet and legs still differs from that of most other animals. The fore legs appear to be longer than the hind legs, and yet the former are somewhat shorter *. The hind legs are not bended in two places like those of the horse and ox, in whom the thigh-bone is almost totally concealed in the buttock, the knee is situated near the belly, and the bones of the foot are so high and so long, that they appear to constitute a great part of the leg. But the foot of the elephant is very short, and rests on the ground. His knee, like that of man, is placed near the middle of the leg. The short foot of the elephant is divided into five toes, which are so covered with the skin as not to be visible. We only see a kind of nails, the number of which varies, though that of the toes remains always the same. There are uniformly five toes on each foot, and commonly five nails † ; but sometimes there are only four ‡, or even three nails ;
and,

* Mem. pour servir à l'hist. des anim. part. 3. p. 102.

† The royal Academy of sciences recommended to me to examine whether all the elephants had nails on their feet. I never saw a single elephant which had not five on each foot at the extremities of the five large toes. But the toes are so short, that they hardly project from the foot ; *Premier voyage du P. Tachard, p. 273.*

‡ All those who have written concerning the elephant, assign five nails to each foot ; but, in our subject, there were
only

and, in this case, they correspond not exactly with the extremities of the toes. Besides, this variety, which has only been remarked in young elephants brought to Europe, seems to be purely accidental, and probably depends on the manner the animal has been treated during the first years of its growth. The sole of the foot is covered with a kind of leather as hard as horn, and projects outward all around. The nails consist of the same substance.

The ears of the elephant are very long, moveable at pleasure, and serve the animal as a fan. The tail is not longer than the ears, being generally from two and a half to three feet in length. It is thin, pointed, and garnished at the extremity with a tuft of thick hairs, or rather threads of a black, glossy, solid, horny substance. This hair or horn is as thick and strong as iron-wire, and a man cannot break it by pulling it with his hands, though it be flexible and elastic. In fine, this tuft of hair is greatly esteemed as an ornament by the Negro women, who are probably attached to it by some superstition *. An elephant's

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tail

only three. The small Indian elephant formerly mentioned had four nails both on the fore and hind feet. But there are uniformly five toes on each foot; *Mem. pour servir à l'hist. des animaux, part. 3. p. 103.*

* Merolla remarks, that many of the Pagans in these countries, and particularly the Saggas, have a devout regard for the elephant's tail. When any of their chiefs die, they preserve, in honour of him, one of these tails, to which they pay a kind of religious worship, founded on the notion of its power.

tail is sometimes fold for two or three flaves; and the Negroes often hazard their lives in endeavouring to cut it off from the live animal. Beside this tuft, the tail is covered, or rather strewed, through its whole extent, with bristles as large and as hard as those of the wild boar. These bristles are also found on the convex part of the trunk and the eye-brows, where they sometimes exceed a foot in length. Bristles or hairs on the eye-lids are peculiar to man, the monkey, and the elephant.

Climate, food, and situation, have a great influence on the growth and size of the elephant. In general, such as are taken young, and reduced to captivity, never acquire their natural dimensions. The largest elephants of India and the eastern parts of Africa are fourteen feet high; the smallest, which are found in Senegal, and other western regions of Africa, exceed not ten or eleven feet; and those which are brought young to Europe never arrive at this height. The Versailles elephant, which came from Congo*, at the age of seven years, was not above seven and a half feet high. During the thirteen years that he lived, he acquired only one foot; so that, at the age of four, when he was transported, he was only

power. They often go a hunting solely with a view to obtain a tail of this kind. But it must be cut off with a single blow from the live animal, without which, superstition ascribes to it no virtue; *Hist. gen. des Voyages, par l'Abbé Prevost, tom. 5. p. 79.*

* Mem. pour servir à l'hist. des animaux, part. 3. p. 101.

only six and a half feet in height; and, as the rate of growth always diminishes as animals advance in years, it cannot be supposed, that, if he had lived thirty years, the common period when the growth of elephants is completed, he would have acquired more than eight feet in height. Hence the domestic state reduces the growth of the elephant one third, not only in height, but in all other dimensions. The length of his body, from the eye to the origin of the tail, is nearly equal to his height at the withers. An Indian elephant, therefore, of fourteen feet high, is more than seven times larger and heavier than the Versailles elephant. By comparing the growth of this animal to that of man, we will find, that an infant, being commonly thirty-one inches high, that is, one half of its height, at the age of two years, and taking its full growth at twenty years, the elephant, which grows till thirty, ought to acquire the half of his height in three years. In the same manner, if we would form a judgment of the enormous mass of the elephant, we will find, that, the volume of a man's body being supposed to be two cubic feet and a half, the body of an elephant of fourteen feet long, three feet thick, and a proportional breadth, would be fifty times as large; and, consequently, that an elephant ought to weigh as much as fifty men*.

‘ I

* Peirère, in his life of Gassendi, says, that an elephant which he caused to be weighed, was three thousand five hundred pounds. This elephant seems to have been very small; for,

‘ I saw,’ says le P. Vincent Marie, ‘ some elephants which were fourteen and fifteen * feet high, with a proportional length and thickness. The male is always larger than the female. The price of these animals augments in proportion to their size, which is measured from the eye to the extremity of the back, and, after exceeding certain dimensions, the price rises like that of precious stones †.’ ‘ The Guiney elephants,’ Bosman remarks, ‘ are ten, twelve, or thirteen feet high ‡; and yet they are incomparably smaller than those of the East Indies; for the historians of that country give more cubits to the height of the latter than the former has feet §.’ ‘ I saw,’ says Edward Terry, ‘ elephants of thirteen feet in height, and many people affirmed, that they had seen elephants fifteen feet high ||.’

From these, and many other testimonies which might be enumerated, we may conclude, that the ordinary stature of the elephant is from ten to eleven feet; that those of thirteen and fourteen are very rare; and that the smallest, when they acquire

for, according to the calculation I have made in the text, the dimensions of which I rather under-rated, would have weighed at least eight thousand pounds.

* These are probably Roman feet.

† Voyage aux indes Orientales du P. Vincent Marie, chap. 11. p. 396.

‡ These are probably Rhenish feet.

§ Voyage en Guinée de Guillaume Bosman, p. 244.

|| Voyage to the East Indies by Edward Terry. *Note.* These are perhaps English feet.

acquire their full growth in a state of liberty, are at least nine feet. These enormous masses of matter fail not, however, as formerly remarked, to move with great quickness. They are supported by four members, which, instead of legs, resemble massy columns of fifteen or eighteen inches diameter, and from five to six feet high. These legs, therefore, are twice as long as those of man. Hence, though the elephant should make but one step, while a man makes two, it would outstrip him in the chace. The ordinary walk of the elephant is not quicker than that of a horse * ; but, when pushed, he assumes a kind of amble, which, in fleetness, is equivalent to a gallop. He performs with promptness, and even with freedom, all direct movements ; but he wants facility in oblique or retrograde motions. It is generally in narrow and hollow places, where the elephant can hardly turn, that the Negroes attack him, and cut off his tail, which they value above all the rest of the body. He has great difficulty in descending steep declivities, and is obliged to fold his hind legs †, that, in going down, the anterior part of his body may be on a level with the posterior, and to prevent being precipitated by his own weight. He swims well, though the form of his legs and feet seem to indicate the contrary. But, as the
 capacity

* Notes of M. de Buffy, communicated by the Marquis de Montmirail.

† Notes of M, de Buffy.

capacity of his breast and belly is large, as the size of his lungs and intestines is enormous, and as all the great parts of his body are filled with air, or matters lighter than water, he sinks not so deep as other animals. He has, therefore, less resistance to overcome, and, consequently, is enabled to swim more quickly with smaller efforts of his limbs. Of course, he is of great use in the passage of rivers. When employed on these occasions *, beside two pieces of cannon which admit three or four pound balls, he is loaded with great quantities of baggage, independent of a number of men fixed to his ears and his tail. When thus loaded, he enters the river, and swims so much below the water that no part of his body is seen except his trunk, which he raises in the air for the benefit of respiration.

Though the elephant generally feeds on herbs and tender wood, and though prodigious quantities of this aliment are necessary to afford a sufficient number of organic particles to nourish so vast a body, he has not several stomachs, like most animals who live on the same substances. He has but one stomach, does not ruminate, and is formed rather like the horse than the ox and other ruminating animals. The want of a paunch is supplied by the largeness and length of his intestines, and particularly of the colon, which is two or three feet in diameter by fifteen or twenty in length. The stomach is much smaller

* Notes of M. de Buffon.

smaller than the colon, being only three and a half or four feet long, and only one or one and a half in its largest diameter. To fill such capacious vessels, it is necessary that the animal, when not furnished with nourishment more substantial than herbage, should eat almost perpetually. Wild elephants, accordingly, are almost continually employed tearing up trees, gathering leaves, and breaking young wood; and the domestic elephants, though supplied with great quantities of rice, fail not to collect herbs whenever they have an opportunity. However great the appetite of the elephant, he eats with moderation, and his taste for cleanliness is superior to the calls of hunger. His address in separating with his trunk the good leaves from the bad, and the care which he takes in shaking them till they are perfectly clear of insects and sand, afford great pleasure to the spectator*. He is fond of wine, aquavita, arrack, &c. By showing him a vessel filled with any of these liquors, and promising him it as the reward of his labours, he is induced to exert the greatest efforts, and to perform the most painful tasks. He seems to love the smoke of tobacco; but it stupefies and intoxicates him. He abhors all bad smells; and has such a terror at the hog, that the cry of that animal makes him fly †.

To

* Notes of M. de Buffon.

† The Versailles elephant had such a terror and aversion at swine, that the cry of a young hog made him fly to a great distance. This antipathy has been remarked by Ælian.

To complete the idea of the nature and intelligence of this singular animal, I shall here add some notes communicated to me by the Marquis de Montmirail, president of the royal academy of sciences, who has been so obliging as not only to collect, but to translate every thing regarding quadrupeds from some Italian and German books with which I am unacquainted. His zeal for the advancement of knowledge, his exquisite discernment, and his extensive knowledge in natural history, entitle him to the highest marks of distinction; and the reader will find how often I shall have occasion to quote him in the subsequent parts of this work. ‘ The elephant is used in dragging
‘ artillery over mountains; and it is on such
‘ occasions that his sagacity is most conspicuous.
‘ When the oxen, yoked to a cannon, make an
‘ effort to pull it up a declivity, the elephant
‘ pushes the breach with his front, and, at each
‘ effort, he supports the carriage with his knee,
‘ which he places against the wheel. He seems
‘ to understand what is said to him. When his
‘ conductor wants him to execute any painful
‘ labour, he explains the nature of the opera-
‘ tion, and recites the reasons which ought to
‘ induce him to obey. If the elephant shows a
‘ repugnance to what is exacted of him, the
‘ *Cornack*, which is the name of the conductor,
‘ promises to give him arrack, or some other
‘ thing that he likes. But it is extremely dan-
‘ gerous

‘gerous to break any promise that is made to
 ‘him : Many cornacks have fallen victims to in-
 ‘discretions of this kind. On this subject, a fact,
 ‘which happened at Dekan, deserves to be rela-
 ‘ted, and, though it has the appearance of in-
 ‘credibility, is, notwithstanding, exactly true.
 ‘An elephant, out of revenge, killed his cornack.
 ‘The man’s wife, who beheld the dreadful
 ‘scene, took her two infants and threw them at
 ‘the feet of the enraged animal, saying, *Since*
 ‘*you have slain my husband, take my life also, as*
 ‘*well as that of my children.* The elephant in-
 ‘stantly stopped, relented, and, as if stung with
 ‘remorse, took the eldest boy in its trunk,
 ‘placed him on its neck, adopted him for its
 ‘cornack, and would never allow any other per-
 ‘son to mount it.

‘If the elephant is vindictive, he is not un-
 ‘grateful. A soldier at Pondicherry was accu-
 ‘stomed to give a certain quantity of arrack to
 ‘one of these animals every time he got his pay ;
 ‘and, having one day intoxicated himself, and,
 ‘being pursued by the guard, who wanted to
 ‘put him in prison, he took refuge under the
 ‘elephant, and fell fast asleep. The guard in
 ‘vain attempted to drag him from this assylum ;
 ‘for the elephant defended him with its trunk.
 ‘Next day, the soldier having recovered from
 ‘his drunkenness, was in dreadful apprehensions
 ‘when he found himself under the belly of an
 ‘animal so enormous. The elephant, which

‘ unquestionably perceived his terror, careffed
 ‘ him with its trunk.

‘ The elephant is fometimes feized with a
 ‘ kind of madnefs, which deprives him of all
 ‘ tractability, and renders him fo formidable,
 ‘ that it is often neceffary to kill him. The
 ‘ people try to bind him with large iron
 ‘ chains, in the hope of reclaiming him.
 ‘ But, when in his ordinary ftate, the moft a-
 ‘ cute pains will not provoke him to hurt thofe
 ‘ who have never injured him. An elephant,
 ‘ rendered furious by the wounds it had received
 ‘ at the battle of Hambour, ran about the field
 ‘ making the moft hideous cries. A foldier,
 ‘ notwithstanding the alarms of his comrades,
 ‘ was unable, perhaps on account of his wounds,
 ‘ to fly. The elephant approached, feemed a-
 ‘ fraid of trampling him under its feet, took him
 ‘ up with its trunk, placed him gently on his
 ‘ fide, and continued its route.’

Thefe notes I have tranfcribed verbatim. They were communicated to the Marquis de Montmirail by M. de Buffy, who refided ten years in India, and performed many important fervices to the ftate. He had feveral elephants under his own charge, often rode upon them; and had daily opportunities of obferving many others, which belonged to his neighbours. Hence thefe notes, as well as all the others quoted under the name of M. de Buffy, merit every degree of credit. The members of the Royal Academy

Academy of Sciences have also left us some facts, which they learned from those who had the management of the elephant at Versailles, and which deserve a place in this work. ‘ The elephant seemed to know when it was mocked by any person; and remembered the affront till an opportunity of revenge occurred. A man deceived it, by pretending to throw something into its mouth: The animal gave him such a blow with its trunk as knocked him down, and broke two of his ribs. After which, it trampled on him with its feet, broke one of his leg, and, bending down on its knees, endeavoured to push its tusks into his belly; but they luckily run into the ground on each side of his thigh, without doing him any injury. A painter wanted to draw the animal in an unusual attitude, with its trunk elevated, and its mouth open. The painter’s servant, to make it remain in this position, threw fruits into its mouth, but generally made only a faint of throwing them. The elephant was enraged, and, as if it knew that the painter was the cause of this teasing impertinence, instead of attacking the servant, it eyed the master, and squirted at him such a quantity of water from its trunk as spoiled the paper on which he was drawing.

‘ This elephant generally made less use of its strength than its address. With great care and coolness, it loosed the buckle of a large
‘ double

‘ double leathern strap, with which its leg was
 ‘ fixed; and, as the domestics had wrapped the
 ‘ buckle round with a small cord, and tied many
 ‘ knots on it, the creature deliberately loosed
 ‘ the whole, without breaking either the cord or
 ‘ the strap. One night, after disengaging itself
 ‘ in this manner from its strap, it broke up the
 ‘ door of its lodge with such dexterity as not to
 ‘ waken the keeper. From thence it went into
 ‘ several courts of the menagery, forcing open
 ‘ doors, and throwing down the walls when the
 ‘ doors were too narrow to let it pass. In this
 ‘ manner it got access to the apartments of o-
 ‘ ther animals, and so terrified them, that they
 ‘ fled into the most retired corners of the enclo-
 ‘ sure.’

In fine, that nothing may be omitted which
 can contribute to throw light upon the natural
 and acquired faculties of an animal so superior
 to all others, we shall add some facts, extracted
 from the most respectable and unsuspecting tra-
 vellers.

‘ Even the wild elephant,’ says le P. Vincent
 Marie, ‘ has his virtues. He is generous and
 ‘ temperate; and, when rendered domestic, he
 ‘ is esteemed for gentleness and fidelity to his
 ‘ master, friendship to his governour, &c. If
 ‘ destined to the immediate service of Princes,
 ‘ he recognises his good fortune, and maintains
 ‘ a gravity of demeanour corresponding to the
 ‘ dignity

‘ dignity of his office. If, on the contrary, less
 ‘ honourable labours are assigned to him, he
 ‘ turns melancholy, frets, and evidently disco-
 ‘ vers that he is humbled and depressed. In
 ‘ war, during the first onset, he is fiery and
 ‘ impetuous. When surrounded with hunters,
 ‘ he is equally brave. But, after being van-
 ‘ quished, he loses all courage. He fights with
 ‘ his tusks, and dreads nothing so much as to
 ‘ lose his trunk, which, from its consistence, is
 ‘ easily cut. I shall only add, that the
 ‘ elephant is mild, attacks no person without
 ‘ being injured, seems to love society, is parti-
 ‘ cularly fond of children, whom he caresses,
 ‘ and appears to discern the innocence of their
 ‘ manners.’

‘ The elephant,’ says Pyrrard *, ‘ is an animal
 ‘ of so much knowledge and judgment, that,
 ‘ beside his infinite utility to man, he may be
 ‘ said to enjoy a certain portion of reason. When
 ‘ about to be ridden, he is so obedient and well
 ‘ trained, that he accommodates his behaviour
 ‘ to the quality of the person he serves. He
 ‘ bends down, and assists his master to mount
 ‘ with his trunk. He is so tractable, that
 ‘ he will perform any thing that is required of
 ‘ him, provided he be treated with gentleness. . .
 ‘ He does every thing he is desired, caresses
 ‘ those who ride on him,’ &c.

‘ By

* Voyage de François Pyrrard, tom. 2. p. 366.

‘ By giving elephants,’ say the Dutch voyagers *, ‘ whatever is agreeable to them, they are soon rendered as tame and submissive as men. They may be said to be deprived only of the use of language. They are proud and ambitious; but they are so grateful for benefits received, that, as a mark of respect, they bow their heads in passing the houses where they have been hospitably received. They allow themselves to be led and commanded by a child †; but they love to be praised and caressed. They quickly feel an injury or an affront; and the guilty person should be on his guard; for he may reckon himself happy if they content themselves with squirting water upon him with their trunks, or simply throwing him into a mire.’

‘ The elephant,’ P. Philippe remarks ‡, ‘ makes a near approach to the judgment and reasoning of man. When compared with the apes, they appear to be stupid and brutal animals. The elephants are so extremely modest, that they will not copulate in the presence of any person; and, if by accident, any man perceives this operation, they infallibly resent it, &c. . . . Their salute is performed by bending the knees, and lowering the head; and, when their
‘ master

* Voyage de la Compagnie des Indes de Hollande, tom. 1.

P. 413.

† Idem, tom. 7. p. 31.

‡ Voyage d’Orient. du P, Philippe de la Très-Sainte-Trinité, p. 366.

‘ master wants to mount them, they assist him
 ‘ with great dexterity. When a wild elephant
 ‘ is taken, the hunters tie his feet, and one ac-
 ‘ costs and salutes him, makes apologies for
 ‘ binding him, protests that no injury is meant,
 ‘ tells him, that, in his former condition, he of-
 ‘ ten wanted food, but that, henceforward, he
 ‘ shall be well treated, and that every promise
 ‘ shall be performed to him, &c. The hunter
 ‘ no sooner finishes this soothing harangue, than
 ‘ the elephant follows him like a tamed lamb.
 ‘ We must not, however, conclude from hence,
 ‘ that the elephant understands language, but
 ‘ only, that, having a very strong discerning
 ‘ faculty, he distinguishes esteem from contempt,
 ‘ friendship from hatred, and all the other emo-
 ‘ tions which men exhibit to him; and for this
 ‘ reason he is more easily tamed by arguments
 ‘ than by blows. With his trunk he
 ‘ throws stones very far, and very straight, and
 ‘ also uses it for pouring water on his body when
 ‘ bathing.’

‘ Of five elephants,’ Tavernier remarks *,
 ‘ which the hunters had taken, three escaped,
 ‘ though ropes and chains were thrown round
 ‘ their bodies and limbs. The natives told us
 ‘ the following most astonishing story, if it could
 ‘ be credited. When an elephant, they said,
 ‘ has once been caught in a pitfall, and escapes
 ‘ from the snare, he becomes extremely diffi-
 ‘ dent,

* Voyage de Tavernier, tom. 3. p. 238.

‘ dent, breaks off a large branch with his trunk,
 ‘ and strikes the ground every where before he
 ‘ sets down his feet, in order to discover by the
 ‘ sound whether there are any concealed holes
 ‘ by which he may be entrapped a second time.
 ‘ For this reason, the hunters who related this
 ‘ story despaired of being able, without much
 ‘ difficulty, to retake the three elephants which
 ‘ had made their escape. Each of the
 ‘ two elephants which had been seized were
 ‘ placed between two tame ones, and surrounded
 ‘ by six men with burning torches, who
 ‘ spoke to the animals, and, presenting food to
 ‘ them, said, in their language, *take this and eat*
 ‘ *it*. The food consisted of small bunches of
 ‘ hay, pieces of black sugar, and boiled rice
 ‘ mixed with pepper. When the wild elephant
 ‘ refused to do what he was ordered, the men
 ‘ ordered the tame elephants to beat him, which
 ‘ they performed, the one striking him on the
 ‘ front and head, and, if the captive animal at-
 ‘ tempted to defend himself, the other struck
 ‘ him on the side; so that the poor creature knew
 ‘ not where he was, and soon found himself ob-
 ‘ liged to obey.’

‘ I have frequently remarked,’ says Edward
 Terry *, ‘ that the elephant performs many ac-
 ‘ tions which seem to proceed more from rea-
 ‘ son than from instinct. He does every thing
 ‘ that his master commands: If he wants to ter-
 ‘ rify

* Voyage to the East Indies by Edward Terry, p. 15.

‘ rify any person, he runs upon him with every
 ‘ appearance of fury, and, when he comes near,
 ‘ stops short, without doing him the smallest
 ‘ injury. When the master chooses to affront
 ‘ any man, he tells the elephant, who collects
 ‘ water and mud with his trunk, and squirts it
 ‘ upon the object pointed out to him. The
 ‘ trunk is composed of cartilage, hangs between
 ‘ the tusks, and is by some called his *hand*, be-
 ‘ cause, on many occasions, it answers the same
 ‘ purposes as the human hand. . . . The Mogul
 ‘ keeps some elephants who serve as execution-
 ‘ ers to criminals condemned to death. When
 ‘ the conductor orders one of these animals to
 ‘ despatch the poor criminals quickly, he tears
 ‘ them to pieces in a moment with his feet.
 ‘ But, if desired to torment them slowly, he
 ‘ breaks their bones one after another, and
 ‘ makes them suffer a punishment as cruel as
 ‘ that of the wheel.’

We might quote many other facts equally
 curious and interesting. But we would soon
 exceed the limits we have prescribed to ourselves
 in this work. We would not even have given
 so long a detail, if the elephant had not been,
 in many respects, the chief animal in the brute
 creation, and who, of course, merited the great-
 est attention.

M. Daubenton has made several useful re-
 marks on the nature and qualities of ivory, and
 has restored to the elephant those prodigious

tusks and bones which have been attributed to the Mammouth. I acknowledge, that I was long doubtful with regard to this point. I had often compared these enormous bones with the skeleton of nearly a full grown elephant preserved in the Royal Cabinet: And as, before composing their history, I could not persuade myself that there existed elephants six or seven times larger than the one whose skeleton I had so often examined, and, as the large bones had not the same proportions with the corresponding bones of the elephant, I believed, with the generality of naturalists, that these huge bones belonged to a much larger animal, the species of which had been lost or annihilated. But it is certain, from the facts formerly mentioned, that there are elephants fourteen feet high, and, consequently, (as the masses are as the cubes of the height), six or seven times larger than that whose skeleton is in the Royal Cabinet, and which was not above seven, or seven and a half feet high. It is likewise certain, that age changes the proportions of bones, and that adult animals grow considerably thicker, though their stature does not increase. In fine, it is certain, from the testimonies of travellers, that there are elephants tusks, each of which weighs more than a hundred and twenty pounds *. From all these facts, it is apparent,

* Mr Eden informs us, that he measured several elephants tusks, which he found to be nine feet long; that others were

parent, that the prodigious bones and tusks above taken notice of, are really the tusks and bones of the elephant. Sir Haas Sloane * says the same thing; but brings no proof of the fact. M. Gmelin affirms it still more positively †, and gives

as thick as a man's thigh; and that some of them weighed ninety pounds. It is said, that, in Africa, some tusks have been found, each of which weighed a hundred and twenty-five pounds. The English voyagers brought from Guiney the head of an elephant, which Mr Eden saw in the possession of Mr Judde: It was so large, that the bones and cranium alone, without including the tusks, weighed about two hundred pounds; from which it was computed, that the whole parts of the head, taken in their entire state, would have weighed five hundred pounds; *Hist. gen. des voyages, tom. 1. p. 223.*—Lopes amused himself in weighing several tusks of the elephant, each of which amounted to about two hundred pounds; *Idem, tom. 5. p. 79.*—The magnitude of elephants may be estimated by their tusks, some of which have been found to weigh two hundred pounds; *Drake's voyage, p. 104.*—In the kingdom of Loango, I purchased two tusks, which belonged to the same animal, and each of them weighed a hundred and twenty-six pounds; *Voyage de la Compagnie des Indes de Hollande, tom. 4. p. 319.*—At the Cape of Good Hope, the elephants teeth are very large, and weigh from sixty to a hundred pounds; *Descript. du Cap de Bonne-espérance, par Kolbe, tom. 3. p. 12.*

* *Hist. de l'Acad. des Sciences, année 1727, p. 1.*

† In Siberia, there are prodigious quantities of bones found in different places under the ground. This part of natural history is both curious and important: I have therefore collected all the facts I could learn upon this subject. Peter the Great, who was a patron of naturalists, gave orders to his subjects, in the year 1722, that, wherever any bones of the mammoth were discovered, the other bones belonging to the animal should be diligently sought for, and the whole sent to Petersburg. These orders were published in all the towns of Siberia,

gives some curious facts on the subject, which deserve to be here related. But M. Daubenton appears

Siberia, and, among others, in Jakutzk, where, after this publication, a Slutchewoi, called *Waflei Otlaſow*, entered into a written obligation before Michael Petrowitſch Iſmailow, captain-lieutenant of the guard, and Woywode of the place, to travel into the inferior cantons of Lena, in order to ſearch for the bones of the mammoth; and he was deſpatched thither on the 23^d of April the ſame year. The following year, another addreſſed the Chancery of Jakutzk, and repreſented, that he had travelled along with his ſon toward the ſea, in queſt of the bones of the mammoth, and that, oppoſite to Surjatoi Noſs, about two hundred verſts from that place and the ſea, he found, in a turfy ſoil, which is common in theſe diſtricts, the head of a mammoth with one of the horns adhering to it; and in the neighbourhood there was another horn of the ſame animal, which had probably fallen off while the creature was alive; that, at a little diſtance, they drew out of the earth another head, with the horns, of an unknown animal; that this head reſembled that of an ox, only it had horns above its noſe; that, on account of an accident which beſet his eyes, he was obliged to leave theſe heads where they were; and that, having heard of his Maſteſty's orders, he now begged to be ſent off with his ſon toward Viſt-janſkoje, Simowie, and the ſea. His demand was complied with, and they were inſtantly deſpatched. A third Slutchewoi of Jakutzk repreſented to the chancery, in 1724, that he made a voyage on the river Jelon; that he was happy enough to diſcover, in a ſteep bank of this river, a freſh head of the mammoth, with the horn and all its parts; that he drew it out of the earth, and left it where he could find it again; and that he begged to be ſent off with two men accuſtomed to ſuch reſearches. The woywode accordingly conſented. The Coſſack ſoon after ſet out on his journey, and found the head and all its parts, excepting the horns; for there remained only the half of one horn, which he brought, along with the head, to the chancery of Jakutzk. Some time after, he brought two horns of the mammoth, which he alſo found on the river Jelon.

appears to be the first who has put the matter beyond all doubt, by accurate mensurations, exact

The Cossacks of Jakutzk were extremely happy to find, under the pretext of going in quest of the bones of the mammoth, an opportunity of making such agreeable voyages. They were furnished with five or six post horses, while one would have been sufficient, and they could employ the rest in carrying various articles of merchandize. Such an advantage was a great encouragement to adventurers. . . . A Cossack of Jakutzk, called *Jwanseisku*, petitioned the chancery to be sent to the Simowies of Alafeisch and Kowymisch, in quest of these kind of bones, and of true crystal. He had already sojourned in these places, had collected many curious objects, and actually sent to Jakutzk some of these bones. Nothing seemed more important than this expedition; and the Cossack was despatched on the 21st day of April 1725.

Nasar-Kolefchow, commissary of Indigirsk, in the year 1723, sent to Jakutzk, and from that to Irkutzk, the bones of a singular head, which, according to my information, was two arschines, bating three werschok, in length, one arschine high, and armed with two horns and a tusk of the mammoth. This head arrived at Irkutzk on the 14th day of October 1723; and I found the history of it in the chancery of that town. I was also assured, that the same man afterwards sent a horn of the mammoth.

These facts, collected from different sources, regard, in general, the same species of bones, namely, 1. All the bones in the Imperial cabinet of Petersburg, under the name of *Mammoth bones*, will be found, upon examination, to have a perfect resemblance to those of the elephant. 2. From what has been above related, it appears, that there have been found in the earth, heads of an animal totally different from an elephant, and which, particularly in the figure of the horns, resembled the head of an ox more than that of an elephant. Besides, this animal could not be so large as an elephant; and I have seen a head of it at Jakutzk, which had been sent from Anadirskoi-Ostrog, and was, according to my information, perfectly similar to that found by Portn-jagin. I myself had one from Ilainkoi-

exact comparisons, and reasonings derived from the

Ilainkoi-Ostrog, which I sent to the Imperial cabinet at Petersburg. In fine, I learned, that, on the banks of Nischnaja-Tunguska, similar heads are not only found every where dispersed, but likewise other bones which unquestionably belong not to the elephant, such as shoulder bones, ossa sacra, ossa innominata, hip-bones, and leg-bones, which probably pertained to the same animal to which the above head ought to be attributed, and which should by no means be excluded from the ox kind. I have seen leg and hip-bones of this species, concerning which I have nothing particular to remark, except that they appeared to be extremely short in proportion to their thickness. Thus, in Siberia, two kinds of bones are found in the earth, of which none were formerly esteemed, but those which perfectly resembled the tusks of the elephant. But, after the Imperial order, the whole began to be examined; and, as the first gave rise to the fable of the mammoth, the last have also been indiscriminately ranked under the same class. Neither must we believe, with Isbrand-Ides, and the followers of his reveries, that it is only in the mountains which extend from the river Ket to the North-east, and, consequently, likewise in the environs of Mangasca and Jakutzk, where the elephants bones are to be found: For they appear not only through all Siberia, not excepting its most southern districts, as in the superior cantons of the Irtsch, Toims, and Lena, but are dispersed in different parts of Russia, and even in many places of Germany, where they are called, with much propriety, by the name of *fossil Ivory*; for they have a perfect resemblance to elephants teeth, except that they are in a corrupted state. In temperate climates, these teeth are softened and converted into fossil ivory; but, in countries frequently frozen, they are generally found very fresh. From this circumstance, the fable, that those and other bones are often found besmeared with blood, might easily arise. This fable has been gravely related by Isbrand-Ides, and, after him, by Muller, (*Moeurs et usages des Ostiaques, dans le Recueil des Voyages au Nord, p. 382.*) who have been copied by others with equal confidence as if there had been no room for doubt: And, as one fiction begets another, the blood pretended to be found on those bones has produced

the extensive knowledge he has acquired in the science of comparative anatomy.

S U P-

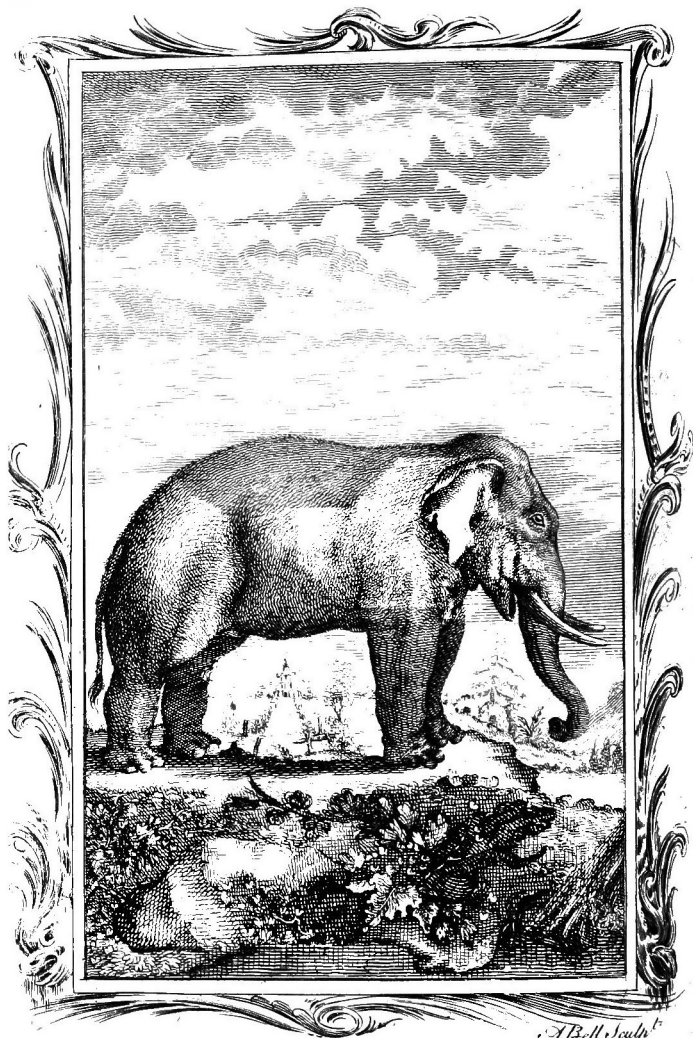
produced the notion, that the mammoth is an animal which lives in Siberia under the ground, where it sometimes dies, and is buried under the rubbish. All this has been invented with the view to account for the blood pretended to be found on these bones. Muller gives a description of the mammoth. This animal, says he, is four or five yards high, and about thirty feet long. His colour is grayish; his head is very long, and his front very broad. On each side, precisely under the eyes, there are two horns, which he can move and cross at pleasure. In walking, he has the power of extending and contracting his body to a great degree. His paws, in thickness, resemble those of the bear. Librandes-Ides is candid enough to acknowledge, that he never knew any person who had seen the mammoth alive. The heads and other bones, which correspond with those of the elephant, unquestionably once constituted real parts of that animal. To this abundance of elephants bones we cannot refuse our assent; and I presume, that the elephants, to avoid destruction in the great revolutions which have happened in the earth, have been driven from their native country, and dispersed themselves wherever they could find safety. Their lot has been different. Some longer, and others shorter after their death, have been transported to great distances by some vast inundation. Those, on the contrary, who survived, and wandered far to the North, must necessarily have fallen victims to the rigours of the climate. Others, without reaching so great a distance, might be drowned, or perish with fatigue. . . . The largeness of those bones ought not to astonish us. The tusks are sometimes four arschines long, and six inches in diameter, (M. de Strahlenberg says they have been seen nine inches in diameter,) and the largest weigh from six to seven puds. I mentioned, in another place, that fresh tusks have been taken from the elephant, which were ten feet long, and weighed a hundred, a hundred and forty-six, a hundred and sixty, and a hundred and sixty-eight pounds. There are pieces of fossil ivory which are yellowish, or grow yellow in the
course

SUPPLEMENT.

From comparing the male and female elephants, the former of which we saw in the year 1771, and the latter in 1773, it appears, that, in general, the parts of the female are grosser and more fleshy. Her ears, indeed, are proportionally smaller than those of the male: But her body is more swollen, her head larger, and her members more rounded.

Like all other animals, the female elephant is more gentle than the male. Our female even caressed people with whom she was unacquainted. But the male is often formidable: The one we saw in 1771 was fiercer, less affectionate, and
more

course of time; others are brown like cocoa nuts, and more lustrous; and others of a blackish blue colour. The tusks which have not been much affected with the frost in the earth, and have remained some time exposed to the air, are subject to become more or less yellow or brown, and assume other colours, according to the species of humidity with which the air is impregnated. M. de Strahlenberg also remarks, that pieces of these corrupted teeth are sometimes of a bluish black colour. For the interest of natural history, it were to be wished, that, with regard to the other bones found in Siberia, we knew the animal to which they belong; but there is little hope of accomplishing this purpose; *Relation d'un voyage à Kamtschatka, par M. Gmelin, imprimé, en 1735 à Peterbourg, en langue Russe.* The translation of this article was first communicated to me by M. de l'Isle, of the academy of sciences, and afterwards by the Marquis de Montmirail.



A. Bell Sculp^t

ELEPHANT.

more ungovernable than this female. In a state of repose, the genitals of the male appear not externally: His belly seems to be perfectly smooth; and it is only at the time of discharging urine, that the extremity of the penis comes out of the sheath. This male elephant, though equally young with the female, was, as formerly remarked, more difficult to manage. He endeavoured to lay hold of people who approached too near, and often tore their clothes. Even his governours were obliged to act with caution; but the female obeyed with complacence and alacrity. The only time she exhibited marks of displeasure was when her keepers forced her into a covered waggon, in order to be carried from one town to another. When they wanted her to enter, she refused to advance, and they could only accomplish their purpose by pricking her behind. Irritated by this ill treatment, and being unable to turn herself in her prison, she had no other method of revenge but to fill her trunk with water, and throw it in torrents upon those who had teased her.

I remarked, in the history of the elephant*, that these animals probably did not copulate in the manner of other quadrupeds; because the position of the organs in both sexes seemed to require that the female, in order to receive the male, should lie on her back. This conjecture, which appeared to be plausible, is not true; for

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the

* See above, p. 59.

the following testimony of M. Marcel Bles, an eye-witness, deserves full credit.

‘ Having perceived that the Count de Buffon, in his excellent work, is deceived with regard to the copulation of the elephants, I know, that, in several parts of Asia and Africa, these animals, especially during the season of love, remain always in the most inaccessible places of the forests; but, in the island of Ceylon, where I lived twelve years, the land being every where inhabited, they cannot so easily conceal themselves; and, having often examined them, I perceived that the female organ is situated nearly under the middle of the belly, which would lead us to think, with M. de Buffon, that the males cannot cover the females in the manner of other quadrupeds. However, there is only a slight difference of situation. When they inclined to copulate, I perceived that the female bowed down her head and neck, and leaned her two fore legs, which were also bended, upon the root of a tree, as if she meant to prostrate herself on the ground; and the two hind legs remained erect, which gave the male an opportunity of embracing her as other quadrupeds do. I can likewise affirm, that the females go with young about nine months. Moreover, the elephants never copulate, unless when in a state of freedom. In the season of love, the males are strongly chained for four or five weeks, during which time, they discharge

‘ charge

‘ charge vast quantities of semen, and are so fu-
 ‘ rious, that their cornacks or governours can-
 ‘ not come near them without danger. The ap-
 ‘ proach of the rutting season is easily known ;
 ‘ for, some days before it happens, an oily liquor
 ‘ flows from a small hole on each side of the
 ‘ head. The domestic female, on these occa-
 ‘ sions, sometimes makes her escape, and joins
 ‘ the wild males in the woods. Some days af-
 ‘ terward, her cornack goes in quest of her, and
 ‘ calls her by her name till she comes. She sub-
 ‘ mits to him with complacence, and allows her-
 ‘ self to be conducted home, and shut up in the
 ‘ stable. It was from cases of this kind that it
 ‘ was discovered that the females bring forth a-
 ‘ bout the end of nine months.’

The first remark, with regard to the mode of
 copulating, seems to be unquestionable, since M.
 Marcel Bles assures us, that he has seen the ele-
 phants perform the operation. But, as to the
 time of gestation, which he limits to nine months,
 we ought to suspend our judgment, because all
 travellers affirm, that the female elephant is
 believed to go with young no less than two years.

THE RHINOCEROS*.

NEXT to the elephant, the Rhinoceros is the strongest quadruped. He is at least twelve feet long, from the extremity of the muzzle

* The rhinoceros has one large horn, sometimes two, placed near the end of the nose; it is sometimes three feet and a half long, black, and smooth. The upper lip is long, hangs over the lower, ends in a point, is very pliable, and serves to collect its food, and deliver it into the mouth. The nostrils are placed transversely. The ears are large, erect, and pointed. The eyes are small and dull. The skin is naked, rough, or tuberculated, and lies about the neck in vast folds. There is another fold from the shoulders to the fore legs, and another from the hind part of the back to the thighs. The skin is so thick and so strong as to turn the edge of a scymeter, and resist a musket ball. The tail is slender, flattened at the end, and covered on the sides with very stiff, thick, black hairs. The belly hangs low. The legs are short, strong, and thick. The hoofs are divided into three parts, each pointing forward; *Pennant's synopsis of quadr.* p. 75.

Though the name of this animal be entirely Greek, it was unknown to the ancient Greeks. Aristotle takes no notice of it. Strabo is the first Greek, and Pliny the first Roman author who mention it. The rhinoceros probably did not frequent that part of India into which Alexander had penetrated, though he met with great numbers of elephants; for it was about three hundred years after Alexander that Pompey first brought this animal to Europe.

Rhinoceros in Italian; *Abada* in Portuguese; *Linscot*, navig. in Orient. pars 2. p. 44. *Abada* in India and Java; *Bontius Ind. Orient.* p. 50. *P. Philippe*, p. 371. *Purchas's Pilgrim*, vol. 2. p. 1001. 1773. *Borri hist. Cochîn-china*, p. 797. *Du Halde's China*,

muzzle to the origin of the tail, and the circumference of his body is nearly equal to his length*.

In

China, vol. 1. p. 120. *Fannul. Sinens.* *Cbiengtuen*den and *Elkerkedon* in Persia; *Pietro della Valle*, tom. 4. p. 245. *Chardin*, tom. 3. p. 45. *Arou-barisi*, according to *Thevenot*; *Relation de divers voyages*, p. 10.

Rhinoceros; *Plin. lib.* 8. c. 20. *Gesner. quad.* p. 842. *Raii synopsis.* p. 122. *Klein. quad.* p. 26. *Grew's Mus.* p. 29. *Worm. Mus.* p. 336. *Brisson. quad.* p. 78. *Phil. Transf. abrid.* vol. 9. p. 93. *Kolben*, vol. 2. p. 101.

Rhinoceros unicornis; *Linn. syst. nat.* p. 104. *Edward's Gleanings of Natural Hist.* p. 221.

Rhinoceros, $\alpha\ \rho\iota\varsigma$ et $\alpha\iota\gamma\alpha\varsigma$. *Naricornis* Catelani. It is called *Noemba* in Java; *Tuabba*, *Nabba*, at the Cape of Good Hope; *Nozorozes*, *Zebati*, in Poland; and *Gomals* in India.

* I have in my possession a figure of a rhinoceros, drawn by an officer of the Shaftsbury East India vessel in the year 1737. The figure corresponds very well with mine. The animal died in the passage from the East Indies to Britain. This officer had written the following note at the bottom of the figure. 'His back was about seven feet high. His colour resembled that of a hog whose skin is beginning to dry after wallowing in the mire. He had three hoofs on each foot. The folds of his skin lay backward on each other. Between these folds were harboured insects, millepeds, scorpions, small serpents, &c. He was not above three years old when his figure was drawn. His penis, when extended, spread out in form of a flower de luce.' In a corner of the plate I have given a figure of the penis. As this figure was communicated to me by Dr Tyson, I had not an opportunity of consulting the author, whether these noxious insects, which he says take up their abode in the folds of the animal's skin, were seen by himself, or whether he only related what had been told him by the Indians. I acknowledge that the fact appears very singular; *Edward's Gleanings*, p. 25. *Note.* This last fact is not only doubtful, but that of the animal's age, compared with his largeness, appears to be false. We saw a rhinoceros of,

In magnitude, therefore, he makes a near approach to the elephant; and he appears to be much less, only because his legs are proportionally shorter than those of the elephant. But he differs still more from the elephant in his natural powers and intelligence; for Nature has bestowed on him nothing that elevates him above the ordinary rank of quadrupeds. He is deprived of all sensibility in his skin; neither has he hands to enable him to improve by the sense of touching; and, instead of a trunk, he has only a moveable lip, to which all his means of dexterity or address is limited. His chief sources of superiority over other animals consists in his strength, his magnitude, and the offensive weapon on his nose, which is entirely peculiar to him. This weapon is a very hard horn, solid throughout its whole extent, and situated more advantageously than the horns of ruminating animals, which defend only the superior parts of the head and neck. But the horn of the rhinoceros preserves from insult the muzzle, the mouth, and the face. For this reason, the tiger will rather attack the elephant, whose trunk he lays hold of, than the rhinoceros, whom he dare not face, without running the risk of having his bowels torn out; for
the

of, at least, eight years of age, which exceeded not five feet in length. Mr Parsons saw one of two years, which was not higher than a heifer, which may be computed at about four feet. How, then, could the rhinoceros above taken notice of be only three years old, if it was seven feet high?

the body and limbs of the rhinoceros are covered with a skin so impenetrable, that he fears neither the claws of the tiger or lion, nor the sword or shot of the hunter. His skin is blackish, being of the same colour, but thicker and harder than that of the elephant, and is not sensible of the stinging of flies. He can neither extend nor contract his skin, which is rolled up into large folds at the neck, the shoulders, and the crupper, in order to facilitate the motion of his head and limbs, which last are massy, and terminated by large feet, armed with three great toes. His head is proportionally longer than that of the elephant; but his eyes are still smaller, and seldom above half open. The upper lip, which projects over the under one, is moveable, and can be stretched out about six or seven inches in length; and it is terminated by a pointed appendix, which gives this animal a power of collecting herbage in handfuls as the elephant does with its trunk. This muscular and flexible lip is a kind of hand or imperfect trunk; but it enables the creature to seize any object with force, and to feel with some dexterity. Instead of those long ivory tusks which constitute the armour of the elephant, the rhinoceros has a formidable horn, and two strong incisive teeth in each jaw. These teeth, of which the elephant is deprived, are situated at a great distance from each other, one in each angle of the jaw. The under jaw is square before; and there are no other incisive teeth

teeth in the anterior part of the mouth, which is covered by the lips. But, beside the four cutting teeth in the four corners of the mouth, there are twenty-four grinders, six on each side of the two jaws. He holds his ears always erect: In figure they resemble those of the hog; but they are proportionally smaller. The ears are the only parts of the body on which there are hairs, or rather bristles. The extremity of the tail, like that of the elephant, is garnished with a bush of large, solid, hard bristles.

Dr Parsons, a celebrated physician in London, to whom the republic of letters is much indebted for many valuable discoveries in natural history, and to whom I owe the highest acknowledgments for the marks of esteem and of friendship with which he has been pleased to honour me, published, in the year 1743, a history of the rhinoceros, from which I shall the more willingly make extracts, because every composition of that gentleman merits the attention and confidence of the public.

Though the rhinoceros was frequently exhibited in the Roman spectacles, from the days of Pompey to those of Heliogabulus; though he has often been transported into Europe in more modern times; and though Bontius, Chardin, and Kolben have drawn figures of him both in India and Africa; yet so ill was he represented and described, that he was very imperfectly known till the errors and caprices of those who had



W. B. Woodcut

had published figures of him were detected by inspection of the animals which arrived in London in the years 1739 and 1741. The figure given by Albert Durer was the first, and the least conformable to Nature ; yet it was copied by most naturalists, some of whom loaded it with preposterous drapery and foreign ornaments. That of Bontius is more simple and correct ; but the inferior part of the legs is improperly represented. That of Chardin, on the contrary, gives a pretty good idea of the feet, and the folds of the skin ; but, in other respects, it has no resemblance to the animal. That of Camerarius is no better ; neither is that drawn from the rhinoceros exhibited at London in the year 1685, and which was published by Carwitham in the 1739. In fine, the figures on the antient pavement of Praeneste, and on Domitian's medals, are extremely imperfect ; but they have the merit of not being deformed by the imaginary ornaments represented in the figure drawn by Albert Durer. Dr Parsons has taken the trouble of drawing this animal himself * in three different

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* One of our learned philosophers, M. de Mours, has made some remarks on this subject, which must not be omitted. ' The figure,' says he, ' of the rhinoceros which Dr Parsons has added to his Memoir, and which he drew from the life, is to differ from that engraved at Paris in the year 1749, from a rhinoceros exhibited at the fair of Saint Germain, that it is difficult to recognise them to be the same animal. That of Dr Parsons is shorter, and the folds of the skin are fewer in number, less marked, and some of them placed in a different position.'

views, before, behind, and in profile. He has likewise drawn the male organs of generation, the

position. The head, particularly, has hardly any resemblance to that of the Saint-Germain rhinoceros. We cannot, however, entertain a doubt with regard to the accuracy of Dr Parsons. The reasons of such remarkable differences must be sought for in the age and sex of the two animals. That of Dr Parsons was drawn from a male rhinoceros, which exceeded not the age of two years. That which I have here added, was drawn from a picture of the celebrated M. Oudry, a most distinguished animal painter. He painted from the life, and of the natural size, the Saint-Germain rhinoceros, which was a female, and at least eight years old; I say, at least eight years; for we see, by an inscription written on the bottom of a wooden print, entitled, *A true portrait of a living rhinoceros exhibited at the fair of Saint-Germain in Paris*, that this animal, when taken, in the 1741, in the province of Assen, belonging to the Mogul, was three years old: And, eight lines lower, it is said, that the animal was only one month old when some Indians entangled it with ropes, after having slain the mother by their spears and darts. Hence it must have been at least eight years of age, and might be ten or twelve. This difference of age is probably the reason of the remarkable differences between Dr Parsons's figure and that of M. Oudry, whose picture, executed by the order of the King, was exhibited in the painter's hall. I shall only remark, that M. Oudry has made the horn of his rhinoceros too long; for I examined the animal with great attention, and I find that this part is better represented in the wooden print. The horn of the present figure was drawn after this print, and the rest is copied from M. Oudry's picture. The animal which it represents was weighed, about a year before, at Stouquart, in the dutchy of Wittemberg, and its weight was at that time five hundred pounds. It eat, according to the relation of Captain Domet Wan-dermeer, who conducted it to Europe, sixty pounds of hay, and twenty pounds of bread, every day. It was very tame, and surprisngly agile, considering the enormity of its mass, and its unwieldy aspect.' These remarks, like all those

the single and double horns, as well as the tail, from other rhinoceroses, whose parts are preserved in the cabinets of natural history.

The rhinoceros which came to London in the year 1739, was sent from Bengal. Though not above two years of age, the expence of his food and journey amounted to near one thousand pounds Sterling. He was fed with rice, sugar, and hay. He had daily seven pounds of rice, mixed with three pounds of sugar, and divided into three portions. He had likewise hay and green herbs, which last he preferred to hay. His drink was water, of which he took large quantities at a time. He was of a peaceable disposition, and allowed all parts of his body to be touched. When hungry, or struck by any person, he became mischievous, and, in both cases, nothing appeased him but food. When enraged, he sprung forward, and nimbly raised himself to a great height, pushing, at the same time, his head furiously against the walls, which he performed with amazing quickness, notwithstanding his heavy aspect and unwieldy mass. I often observed, says Dr Parsons, these movements produced by rage or impatience, especially in the mornings before his rice and sugar were brought to him. The vivacity and promptitude of his movements, Dr Parsons adds, led me

of M. de Mours, are judicious and sensible. See the figure in his French translation of the Philosophical Transactions, ann. 1743.

me to think, that he is altogether unconquerable, and that he could easily overtake any man who should offend him.

This rhinoceros, at the age of two years, was not taller than a young cow that has never produced. But his body was very long and very thick. His head was disproportionally large. From the ears to the horn there is a concavity, the two extremities of which, namely the upper end of the muzzle, and the part near the ears, are considerably raised. The horn, which was not yet above an inch high, was black, smooth at the top, but full of wrinkles directed backward at the base. The nostrils are situated very low, being not above an inch distant from the opening of the mouth. The under lip is pretty similar to that of the ox; but the upper lip has a greater resemblance to that of the horse, with this advantageous difference, that the rhinoceros can lengthen this lip, move it from side to side, roll it about a staff, and seize with it any object he wishes to carry to his mouth. The tongue of this young rhinoceros was soft, like that of a calf †. His eyes had no vivacity: In figure,

† Most voyagers and all naturalists, both ancient and modern, tell us, that the tongue of the rhinoceros is very rough, and its papillae so sharp, that, with the tongue alone, he tore the flesh from a man's body even to the bones. This fact, which is every where related, appears to be very suspicious and ill imagined; because the rhinoceros does not eat flesh, and animals, in general, which have rough tongues, are seldom carnivorous.

figure, they resembled those of the hog, and were situated lower, or nearer the nostrils, than in any other quadruped. His ears are large, thin at the extremities, and contracted at their origin by a kind of annular rugosity. The neck is very short, and surrounded with two large folds of skin. The shoulders are very thick, and, at their juncture, there is another fold of skin, which descends upon the fore legs. The body of this young rhinoceros was very thick, and pretty much resembled that of a cow about to bring forth. Between the body and crupper there is another fold, which descends upon the hind legs. Lastly, another fold transversely surrounds the inferior part of the crupper, at some distance from the tail. The belly was large, and hang near the ground, particularly its middle part. The legs are round, thick, strong, and their joint bended backwards. This joint, which, when the animal lies, is covered with a remarkable fold of the skin, appears when he stands. The tail is thin, and proportionally short; that of the rhinoceros so often mentioned, exceeded not sixteen or seventeen inches in length. It turns a little thicker at the extremity, which is garnished with some short, thick, hard hairs. The form of the penis is very extraordinary. It is contained in a prepuce or sheath, like that of the horse; and the first thing that appears in the time of erection, is a second prepuce, of a flesh-colour, from which there issues

a hollow tube, in the form of a funnel cut and bordered somewhat like a flower de luce *, and constitutes the glans and extremity of the penis. This anomalous glans is of a paler flesh-colour than the second prepuce. In the most vigorous erection, the penis extends not above eight inches out of the body; and it is easily procured by rubbing the animal with a handful of straw when he lies at his ease. The direction of this organ is not straight, but bended backward. Hence he throws out his urine behind; and, from this circumstance, it may be inferred, that the male covers not the female, but that they unite with their cruppers to each other. The female organs are situated like those of the cow, and she exactly resembles the male in figure and grossness of body. The skin is so thick and impenetrable, that, when a man lays hold of any of the folds, he would imagine he is touching a wooden plank of half an inch thick. When tanned, Dr Grew remarks, it is excessively hard, and thicker than the hide of any other terrestrial animal. It is every where covered more or less with incrustations in the form of galls or tuberosities, which are pretty small on the top of the neck and back, but become larger on the sides. The largest are on the shoulders and crupper, are still pretty large on the thighs and legs, upon which they are spread all round, and even on the feet. But, between the folds, the skin

* Phil. Transf. No. 470. pl. 111. Edwards Gleanings.

skin is penetrable, delicate, and as soft to the touch as silk, while the external part of the fold is equally hard with the rest. This tender skin between the folds is of a light flesh-colour; and the skin of the belly is nearly of the same colour and consistence. These galls or tuberosities should not be compared, as some authors have done, to scales. They are only simple indurations of the skin, without any regularity in their figure, or symmetry in their respective positions. The flexibility of the skin in the folds enables the rhinoceros to move with facility his head, neck, and members. The whole body, except at the joints, is inflexible, and resembles a coat of mail. Dr Parsons remarks, that this animal listened with a deep and long continued attention to any kind of noise; and that, though he was sleeping, eating, or obeying any other pressing demands of nature, he raised his head, and listened till the noise ceased.

In fine, after giving this accurate description of the rhinoceros, Dr Parsons examines whether the rhinoceros, with a double horn, exists; and, having compared the testimonies of the ancients and moderns, and the remains of this variety in the collections of natural objects, he, with much probability, concludes, that the rhinoceroses of Asia have commonly but one horn, and that those of Africa have generally two.

It is unquestionably true, that some rhinoceroses have but one horn, and that others have

two*. But it is not equally certain that this variety is constant, and depends on the climate of Africa or India; or that this difference is alone sufficient to constitute two distinct species. It appears that the rhinoceroses, with one horn, have this excrescence always longer than those with two. There are single horns of three and a half, and perhaps of above four feet in length, by six or seven inches diameter at the base. Some double horns are two feet long †. These horns are commonly of a brown or olive colour; though there are instances of their being gray, and even white. They have only a slight concavity in form of a cup under the base, by which they are fixed to the skin of the nose. The rest of the horn is solid and harder than common horn. It is with this weapon that the rhinoceros

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* Kolben asserts positively, and as if he had been an eye-witness, that the first horn of the rhinoceros is upon the nose, and the second upon the front, in a right line with the first; that the latter, which is brown, never exceeds two feet in length; and that the second is yellow, and seldom longer than six inches; *Descript. du Cap de Bonne Esperance, tom. 3. p. 17.*—But we have already mentioned double horns, the second differing very little from the first, which was two feet long, and both were of the same colour. Besides, it appears to be certain, that they are never at such a distance from each other, as this author has placed them; for the bases of the two horns, preserved in the cabinet of Sir Hans Sloane, were not three inches asunder.

† *Ursus cornu gemino*; *Martial. spectac. ep. 22. Phil. Transf. abrid. vol. 9. p. 100. vol. 11. p. 910. Phil. Transf. vol. 56. p. 32. tab. 2. Flacourt, Hist. Madag. p. 395. Lobo Abyss. p. 230. Rhinoceros bicornis*; *Linn. Syst. Nat. p. 104.*

ros is said to attack and sometimes mortally wound the largest elephants, whose tall legs give the rhinoceros an opportunity of striking, with his snout and horn, their bellies, where the skin is most tender and penetrable. But, if he misses his first blow, the elephant throws him on the ground and kills him.

The horn of the rhinoceros is more esteemed by the Indians than the ivory of the elephant, not on account of its real utility, though they make several toys of it with the chisel and turner's lathe, but on account of certain medicinal qualities they ascribe to it *. The white horns,
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* Sunt in regno Bengalæ rhinocerotes Lusitanis *Abadas* dicti, cujus animalis corium, dentes, caro, sanguis, ungulae et caeterae ejus partes toto genere resistunt venenis; qua de causa in maximo pretio est apud Indos.—In these parts of Bengal which border on the Ganges, the rhinoceroses or unicorns, there called *Abades*, are very common, and numbers of their horns are brought to Goa. They are about two palms in circumference at the base, gradually taper to a point, and serve the animal as a defensive weapon. They are of an obscure colour, and the cups made of them are highly esteemed, especially if they have the power of counteracting poisonous liquors; *Voyage du P. Philippe*, p. 371.—Every part of the rhinoceros's body is medicinal. His horn is a powerful antidote against all kinds of poison; and the Siamese make a great article of traffic with it among the neighbouring nations. Some of them are sold for more than a hundred crowns. Those which are of a bright gray colour, and spotted with white, are most valued by the Chinese; *Hist. Nat. de Siam, par Nic. Gervaise*, p. 34.—Their horns, teeth, toes, flesh, skin, blood, and even their urine and excrements, are in great request among the Indians as powerful remedies for different diseases; *Voyage de la Compagnie des Indes de Hollande*, tom. 1. p. 417.

being rareſt, are in great requeſt. Among the preſents ſent by the King of Siam to Lewis XIV. in the year 1686 *, were fix horns of the rhinoceros. In the royal cabinet we have twelve, of different ſizes; and one of them, though cut, is three feet eight inches and a half long.

The rhinoceros, without being ferocious, carnivorous, or even extremely wild, is, however, perfectly untractable †. He is nearly among large, what the hog is among ſmall animals, raſh and brutal, without intelligence, ſentiment, or docility. He ſeems even to be ſubject to paroxyſms of fury, which nothing can appeaſe;
for

417.—His horn is placed between the two noſtrils; it is very thick at the baſe, and terminates in a ſhort point: It is of a greeniſh brown colour, and not black, as ſome authors maintain. When very gray, or approaching to white, it brings a high price. But it is always dear, on account of the value put on it by the Indians; *Idem, tom. 7. p. 277.*

* Among the preſents ſent by the King of Siam to France, in the year 1686, were fix rhinoceroſes horns, which were greatly valued over all the Eaſt. The Chevalier Vernati has written from Batavia to Britain, that the horns, teeth, toes, and blood of the rhinoceros, are antidotes, and that they are as much uſed in the Indian pharmacopoeia as the theriaca in that of Europe; *Voyage de la Compagnie des Indes de Hollande, tom. 7. p. 484.*

† Chardin ſays, (*tom. 3. p. 45.*) that the Abyſſinians tame the rhinoceros, and train him to labour, like the elephants. This fact ſeems to be extremely ſuſpicious: No other author mentions it; and it is well known, that, in Bengal, Siam, and other ſouthern parts of India, where the rhinoceros is, perhaps, ſtill more common than in Æthiopia, and where the natives are accuſtomed to tame the elephants, he is regarded as an irreclaimable animal, of which no domeſtic uſe can be made.

for the one which Emanuel King of Portugal sent to the Pope in the year 1513, destroyed the vessel in which they were transporting him *; and the rhinoceros, which we lately saw in Paris, was drowned in the same manner in its voyage to Italy. Like the hog, these animals are fond of wallowing in the mire. They love moist and marshy grounds, and never quit the banks of rivers. They are found in Asia and Africa, in Bengal †, Siam ‡, Laos §, Mogul ¶, Sumatra **, at Java in Abyssinia ††, in Æthiopia †††, in the country of the Anzicos §§§, and as far as the Cape of Good Hope §§§. But, in general, the species is not numerous, and much less diffused than that of the elephant. The female produces but one at a time, and at considerable intervals. During the first month, the
 young

* Philosophical transactions, No. 470.

† Voyage du P. Philippe, p. 371.—Voyage de la Compagnie des Indes de Hollande, tom. 1. p. 417.

‡ Histoire naturelle de Siam, par Gervaise, p. 33.

§ Journal de l'abbé de Choisy, p. 339.

¶ Voyage de Tavernier, tom. 3. p. 97.—Voyage d'Edward Terri, p. 15.

** Histoire generale des voyages, par M. l'abbé Prevôt, tom. 9. p. 339.

†† Voyage de la Compagnie des Indes de Hollande, tom. 7. p. 277.

††† Voyage de Chardin, tom. 3. p. 45.—Relation de Thevenot, p. 10.

§§§ Histoire generale des voyages, par M. l'abbé Prevôt, tom. 5. p. 91.

§§ Voyage de Franc. le Guat. tom. 2. p. 145.—Description du cap de Bonne-esperance, par Kolbe, tom. 3. p. 15. et suiv.

young rhinoceros exceeds not the size of a large dog *. When recently brought forth, it has no horn †, though the rudiments of it appear in the foetus. At the age of two years, the horn exceeds not an inch in length ‡, and, at the age of six, it is from nine to ten inches long ||: Now, as some of these horns are known to be near four feet in length, it appears that they continue to grow during the half, or perhaps during the whole of the animal's life, which must be considerably long, since the rhinoceros described by Dr Parsons had only acquired about one half of its height at the age of two years; from which we may conclude, that this animal, like man, should live seventy or eighty years.

Without the capacity of becoming useful, like the elephant, the rhinoceros is equally hurtful by his voracity, and particularly by the great waste he makes in the cultivated fields. He is of no use till he is slain. His flesh is reckoned excellent

* We have seen a young rhinoceros which was not larger than a dog. It followed its master every where, and drank the milk of the buffalo. But it lived only three weeks. The teeth were beginning to appear; *Voyage de la Compagnie des Indes de Hollande, tom. 7. p. 483.*

† In two young rhinoceroses, nothing but a prominence was observed on the place where the horns were to arise, though the animals were then as large as an ox. But their legs are very short, especially those before, which are shorter than the hind legs; *Voyage de Pietro della Valle, tom. 4. p. 245.*

‡ Phil. Trans. No. 470.

|| Id. ibid.

excellent by the Indians and Negroes *; and Kolbe says he often eat it with pleasure. His skin makes the hardest and best leather in the world †; and not only his horn, but all the other parts of his body, and even his blood ‡, urine, and excrements, are esteemed to be antidotes against poison, or remedies for particular diseases. These antidotes or remedies, extracted from different parts of the rhinoceros, are of equal use in the Indian pharmacopoeia as the theriaca in that of Europe §. Most of the virtues ascribed to both are probably imaginary: But how many objects are in the highest repute, which have no value but in the opinions of men?

The rhinoceros feeds on the grossest herbs, as thistles, and thorny shrubs, which he prefers to the soft pasture of the best meadows §. He is fond of

* The Indians eat the flesh of the rhinoceros, and reckon it excellent. They even derive advantage from his blood, which they collect with care as a remedy for diseases in the breast; *Hist. Nat. de Siam, par Gervaise, p. 35.*

† His skin is of a fine gray colour, approaching to black, like that of the elephant; but it is rougher and thicker than that of any other animal. . . . The skin is covered every where, except on the neck and head, with small knots or tubercles, &c.; *Voyage de Chardin, tom. 3. p. 45.*

‡ *Voyage de Mandello, tom. 2. p. 350.*

§ *Voyage de la Comp. des Indes de Hollande, tom. 7. p. 484.*

§ This animal feeds upon plants, and prefers bruthwood, broom, and thistles. But of all plants he is fondest of a shrub which resembles the juniper, and is called the *rhinoceros shrub*. Great quantities of it grow on heathy lands and on the mountains;

of the fugar cane, and likewise eats all kinds of grain. Having no appetite for flesh, he neither disturbs the small, nor fears the large animals, but lives in peace with all, not excepting the tiger, who often accompanies the rhinoceros, without daring to attack him. This peaceful disposition renders the combats between the elephant and the rhinoceros very suspicious: Such combats must at least be rare, since there is no motive to war on either side. Besides, no antipathy has ever been remarked between these animals. They have been known, even in a state of captivity, to live peaceably together, without discovering any marks of resentment or antipathy *. Pliny, I believe, is the first author who mentions these combats between the elephant and rhinoceros. It appears that these animals were compelled to fight at the Roman spectacles †; and from hence, probably, the idea was formed, that these animals, when in their

mountains; *Descript. du Cap. de Bonne-esperance, par Kolbe, tom. 3. p. 17.*

* The Dutch history, entitled *l'Ambassade de la Chine*, gives a false description of this animal, especially when it exhibits the rhinoceros as the chief enemy of the elephant; for the rhinoceros I am mentioning was kept in the same stable with two elephants, and I have several times seen them near each other, without discovering the smallest antipathy. An Æthiopian ambassador had brought this animal as a present; *Voyage de Chardin, tom. 3. p. 45.*

† The Romans took pleasure in making the rhinoceros and elephant fight at their public shews; *Singular. de la France Antarctique, par André Thevet, p. 41.*

their natural state of liberty, fight in the same manner. But every action without a motive is unnatural; it is an effect without a cause, which cannot happen but by accident.

The rhinoceroses assemble not, nor march in troops, like the elephants. They are more solitary and savage; and it is, perhaps, more difficult to hunt and to overcome them. They never attack men *, unless they are provoked, when they become furious and formidable. Their skin is so hard as to resist sabres, lances, javelins, and even musket balls †. The only penetrable parts of his body are the belly, the

* The rhinoceros never attacks any person, nor becomes furious, unless he is provoked, and then his ferocity is tremendous; he grunts like a hog, and overturns trees and every thing that comes in his way; *Voyage de la Compagnie des Indes de Hollande, tom. 7. p. 278.*

† His skin is thick, hard, and rough. . . . It is even impenetrable by the sabres of the Japanese, and coats of arms, bucklers, &c. are made of it; *Id. Ibid. p. 483.*—The rhinoceros seldom attacks men, unless when provoked, or the man wears a red habit. In both these cases, he becomes furious, and overturns every thing that opposes him. When these animals attack a man, they seize him by the middle of the body, and toss him up with such force, that he is killed by the fall. . . . However enraged he may be, it is easy to avoid his approach: He is, indeed, very swift; but he turns with great difficulty. Besides, according to my information, he sees only what is before him. Hence, when he comes within a few paces, we have only to step to a side; for he then loses sight of us, and it is very difficult for him to return in quest of us. I have experienced this fact, having more than once seen him advance toward me with all his fury; *Descript. du Cap de Bonne-esperance, par Kolbe, tom. 3. p. 17.*

the eyes, and about the ears *. Hence the hunters, instead of attacking him face to face, follow him at a distance by the tracks of his feet, and watch till he lies down to sleep. We have, in the royal cabinet, a foetus of a rhinoceros, which was extracted from the body of the mother, and sent to us from the island of Java. By the memoir which accompanied this foetus, we are informed, that twenty-eight hunters having assembled to attack the mother, they followed her at a distance for some days, detaching one or two of their number, from time to time, in order to reconnoitre her situation; that, by this means, they surpris'd her when asleep, and silently approached so near, that the whole twenty-eight muskets were discharged at once into the lower part of her belly.

From the description given by Dr Parsons, it appears that this animal has an acute and very attentive ear. We are likewise assured that his
sense

* It is difficult to kill him; and men never attack him without danger of being torn to pieces. Those who are accustomed to hunt the rhinoceros find means, however, to defend themselves from his fury; for he is fond of marshy grounds; they observe when he repairs thither, and, concealing themselves among the bushes opposite to the direction of the wind, they watch till he lies down either to sleep or to wallow, that they may have an opportunity of shooting him near the ears, where alone he can receive a mortal wound. They place themselves against the wind; because the scent of the rhinoceros is so acute, that he never approaches any object he perceives till the smell of it reaches his nostrils; *Hist. Nat. de Siam, par Gervaise, p. 35.*

sense of smelling is excellent. But it is said, that his eyes are not good, and that he sees such objects only as are before him *. The extreme minuteness of his eyes, their low, oblique, and deep situation, the dullness, and the small degree of motion they seem to possess, tend to confirm this fact. His voice, when he is in a state of tranquillity, is blunt, and resembles the grunting of a hog; but, when enraged, it becomes sharp, and is heard at a great distance. Though he lives on vegetables only, he does not ruminate. Hence it is probable, that, like the elephant, he has but one stomach, and capacious bowels, which supply the place of many stomachs. His consumption of food, though considerable, is not near so great as that of the elephant; and it appears, from the density and un-

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interrupted

* See the preceding Note.—The eyes of the rhinoceros are very small, and he sees only forward. When he walks, or pursues his prey, he proceeds always in a direct line, forcing, overturning, and piercing through every obstruction that falls in his way. Neither bushes, nor trees, nor thickets of brambles, nor large stones, can turn him from his course. With the horn on his nose, he tears up trees, raises stones high in the air, and throws them behind him to a considerable distance, and with a great noise: In a word, he overthrows every object which he can lay hold of. When he is enraged, and meets with no obstruction, lowering his head, he plows the ground, and throws large quantities of earth over his head. He grunts like a hog: His cry, when in a state of tranquillity, does not reach far; but, when in pursuit of his prey, it may be heard at a great distance; *Descript. du Cape de Bonne-esperance, par K. He.*

interrupted thickness of his skin, that he also loses much less by perspiration.

S U P P L E M E N T.

I have seen a second rhinoceros, which was lately brought to the royal menagerie. In the month of September 1770, if the people who conducted it can be credited, the animal was only three months old. But, I am persuaded, that it was at least two or three years of age; for its body, including the head, was already eight feet two inches long, five feet six inches high, and eight feet two inches in circumference. A year afterward, its body was lengthened seven inches; so that, on the 28th day of August 1771, it was eight feet nine inches, including the length of the head, five feet nine inches high, and eight feet nine inches in circumference. On the 12th day of August 1772, the length of the body, comprehending the head, was nine feet four inches, the height of the crupper six feet four inches, and that of the withers only five feet eleven inches. Its skin had the colour and appearance of an old elm tree, spotted in some places with black and gray, and in others doubled into deep furrows, which formed a kind of scales. It had only one horn, the
colour

colour of which was brown, and its substance solid and hard. The eyes were small and prominent, the ears large, and pretty similar to those of an ass. The back, which was hollow or depressed, seemed to be covered with a natural saddle. The legs were short and very thick. The feet were rounded behind, and divided before into three hoofs. The tail resembled that of an ox, and was garnished with black hairs at the extremity. The penis lay along the testicles, and erected itself for the discharge of urine, which the animal threw out to a great distance. The point of it was also very remarkable, forming a cavity like the mouth of a trumpet. The sheath from which it issues is fleshy, and of a vermilion colour, like the penis itself. This fleshy substance which formed the first tube, came out of a second sheath composed of skin, as in other quadrupeds. The tongue is so hard and rough, that it tears off the skin of any person whom it licks; hence this animal eats large thorns, without feeling any pain. The rhinoceros requires one hundred and sixty pounds of food every day. His flesh is much relished by the Indians and Africans, and especially by the Hottentots. If trained when young, he might be rendered domestic, and, in this state, he would multiply more easily than the elephant.

‘ I could never discover the reason (M. P. remarks) why in Asia the rhinoceros is allowed
 ‘ to

‘ to remain in a wild state, while in Abyffinia
 ‘ he is rendered domestic, and is employed in
 ‘ carrying burdens*.’

‘ M. de Buffon,’ says Mr Bruce, ‘ conjectured
 ‘ that there were, in the interior parts of Africa,
 ‘ rhinoceroses with two horns. This conjecture
 ‘ is fully verified; for all the rhinoceroses I saw
 ‘ in Abyffinia had two horns. The first, that is,
 ‘ the one nearest the nose, is of the common
 ‘ form; the second is sharp at the point, and
 ‘ always shorter than the first. Both spring at
 ‘ the same time; but the first grows more quick-
 ‘ ly, and exceeds the other in size, not only du-
 ‘ ring the time of growth, but during the whole
 ‘ life of the animal †.’

On the other hand, M. Allamand, a very able naturalist, wrote to M. Daubenton a letter, dated at Leyden, October 31. 1766, in the following terms:

‘ I recollect a remark of M. Parsons, in a
 ‘ passage quoted by M. de Buffon: He suspect-
 ‘ ed that the rhinoceroses of Asia have but one
 ‘ horn, and that those of the Cape of Good
 ‘ Hope have two. I suspect the very opposite:
 ‘ The heads of the rhinoceroses which I received
 ‘ from Bengal and other parts of India, had al-
 ‘ ways double horns, and all those which came
 ‘ from

* *Defensé des Recherches sur les Americains*, p. 95.

† Note communicated by Mr Bruce to M. de Buffon.

‘ from the Cape of Good Hope had but one
‘ horn.’

This last passage proves what we have formerly remarked, that the rhinoceroses with double horns form a variety in the species, a particular race, which is found equally in Asia and Africa.

The

The CAMEL* and DROMEDARY**.

THE names *Camel* and *Dromedary* signify not two different species, but only two distinct races of the camel, which have subsisted long

* There are two species of the camel, the Bactrian camel, and the Arabian camel or Dromedary. They have no cutting teeth in the upper jaw. The upper lip is divided, like that of the hare; and they have six cutting teeth in the lower jaw.—The Bactrian camel has two bunches on the back, a small head, short ears, and a long, slender, bending neck. The height, to the top of the bunches, is six feet six inches. The hair is soft, longest about the neck, under the throat, and about the bunches. The colour of the hair on the protuberances is dusky, on the other parts it is a reddish ash-colour. The tail is long, the hair on the middle is soft, and coarse, black, and long on the sides. The hoofs are small; the feet flat, divided above, but not through. The bottom of the feet is excessively tough, yet pliant. There are six callosities on the legs, one on each knee; one on the inside of each fore-leg, on the upper joint; one on the inside of the hind-leg, at the bottom of the thigh; another on the lower part of the breast, the places that the animal rests on when it lies down; *Pennant's Synops. of Quad. p. 60.*

In Greek, *Καμηλος Βακτρος*; in Latin, *Camelus*; in Italian, *Camelo*; in Spanish *Camelo*; in German, *Koemel*; in Hebrew, *Gamal*; in Chaldean, *Gamala*; in antient Arabic, *Gemal*; in modern Arabic, *Gimel*; in French, *Chameau*. From these denominations, it appears, that the name of this animal has been adopted into modern languages, with little variation, from the antient Hebrew, Chaldean, and Arabic.

Camelus

long previous to the records of history. The chief, and perhaps the only sensible character by which these two races are distinguished, is, that the camel has two bunches on the back, and the dromedary but one. The latter is also somewhat smaller and weaker than the camel. But both of

Camelus Bactrianus; *Arist. Hist. Anim. lib. 2. cap. 1.*—*Plin. lib. 8. cap. 18.*—*Gesner, Icon. quad. p. 22.*—*Prosp. Alpin. Hist. Nat. Egypt. tom. 2. p. 224. tab. 13.*

Camel called Becheti; *Leo, Afric. p. 338.*

Camelus duobus in dorso tuberibus, seu Bactrianus; *Raii, Synops. Quad. p. 145.*

Camelus Bactrianus, topbis dorfi duobus; *Linn. Syst. Nat. p. 90.*—*Klein, Quad. p. 41.*

Persian camel; *Russel's Aleppo, p. 57.*

** The Arabian camel, or dromedary, has but one bunch on the back. In all other respects it is like the preceding, and is equally adapted for riding or carrying loads; *Pennant's Synops. of Quad. p. 62.*

In Greek, *Δρομας*, or rather *Camelus Dromas*; for *dromas* is only an adjective derived from *dromos*, which signifies *swiftness*, and *camelus dromas* is equivalent to the *swift running camel*: In modern Latin, *Dromedarius*; in the Levant, *Maibary*, according to Doctor Shaw.

Camelus Arabicus; *Arist. Hist. Anim. lib. 2. cap. 1.*—*Plin. lib. 8. cap. 18.*

Camelus dromas; *Gesner. Quad. p. 159. Icon. Quad. p. 23. Prosp. Alpin. Hist. Egypt. tom. 1. p. 223. tab. 12.*

Camelus unico in dorso gibbo, seu dromedarius; camel or dromedary; *Raii, Synops. Quad. p. 143. Klein, Quad. p. 42.*

Camel called *Hugiun*; *Leo Afric. p. 338.*

Camelus dromedarius, topho dorfi unico; *Linn. Syst. Nat. p. 90.*

Chameau; *Mem. pour servir à l'hist. des Animaux, part. 1. p. 69. pl. 7.*

Camel with one bunch; *Pocock's travels, vol. 1. p. 207. Shaw's travels, p. 239. Russel's Hist. of Aleppo, p. 56. Plaisted's journal, p. 82.*

of them intermix and produce; and the individuals which proceed from this crossing of the races, are the most vigorous, and preferred to all others *. These mongrels form a secondary race, which multiply among themselves, and likewise mix with the primary races. Hence, in this species, as well as in those of other domestic animals, there are many varieties, the most general of which proceed from the influence of different

* The Persians have several kinds of camels. Those with two bunches they call *bugbur*, and those with one, *schuttur*. Of these last there are four kinds. Those called, from their excellence, *Ner*, that is *male*, which proceed from a mixture of a dromedary, or a camel with two bunches, and a female with one bunch, which is called *Maje*, are never allowed to be covered by others, and are so highly esteemed, that some of them sell for a hundred crowns. They carry loads of nine or ten hundred pounds, and are most indefatigable. When in season, they eat little, foam at the mouth, grow enraged, and bite. To prevent them from hurting their keepers, the Persians put muzzles on their mouths, which are called *agrab*. The camels which proceed from this kind degenerate much, and become weak and indolent. It is for this reason that they are called *Jurda Kaidem* by the Turks, and sell at thirty or forty crowns only.

The third kind, called *Lohk*, are not so good as the *Bugbur*. When in season, they foam not, but push out from under their throat a red bladder, which they again retract with their breath, raise their heads, and often swell. They sell at sixty crowns, and are by no means so strong as the other kinds. Hence the Persians, when they speak of a valiant man, say that he is a *Ner*, and a poltroon is called *Lohk*. A fourth kind are called by the Persians *Schuturi Baad*, and by the Turks *Jeldovesi*, that is, *Wind-camels*. They are smaller, but more sprightly than the other kinds; for, instead of walking, like ordinary camels, they trot and gallop as well as horses; *Voyage d'Olearius, tom. 1. p. 550.*

different climates. Aristotle * has marked the two principal races with much propriety; the first, or the one with two bunches, under the name of the *Bactrian camel* †, and the second under that of the *Arabian camel*. The first are called *Turkish camels* ‡, and the other *Arabian camels*. This distinction still subsists; but, as many parts of Africa and Asia are now discovered,

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vered,

* *Camelus proprium inter caeteros quadrupedes habet in dorso, quod tuber appellant, sed ita ut Bactrianae ab Arabiis differant; alteris enim bina, alteris singula tubera habentur; Arist. hist. anim. lib. 2. cap. 1.*—Theodore Gaza, whose translation I have uniformly followed when I quote from Aristotle, appears to have rendered this passage in an ambiguous manner: *Alteris enim bina, alteris singula tubera habentur*, signifies only that some have two, and others but one bunch; while the Greek text mentions expressly, that the Arabian camels have but one, and the Bactrian camels two bunches. Pliny likewise, who, in this article, as well as in many others, copies Aristotle, has translated this passage much better than Gaza; *Cameli Bactriani et Arabici differunt, quod illi bina habent tubera in dorso, hi singula*; Plin. Hist. Nat. lib. 8. cap. 18.

† Bactriana is a province of Asia, which now includes Turkestan, the country of the Usbecks, &c.

‡ We went to Mount Sinai upon camels, because there is no water on this road, and other animals cannot travel without drinking. . . . But the Arabian camels, which are small, and different from those of Cairo, who come from Sour, and other places, can travel three or four days without drink. . . . They travel from Cairo to Jerusalem, not only upon these small Arabian camels, but upon a larger kind, which are called *Turkish camels*; *Voyage de Pietro della Valle, tom. 1. p. 360, et 408.*—In Barbary, the dromedary is called *Mashuri*; and is not so common in Barbary as in the Levant. . . . This species differs from the ordinary camel, by having a rounder and handsomer body, and only one small bunch on the back; *Shaw's Travels*.

vered, which were unknown to the antients, it appears, that the dromedary is incomparably more numerous, and more generally diffused, than the camel. The latter is found only in Turkestan *, and some other places of the Levant †. But, in Arabia, the dromedary is more common than any other beast of burden. It is likewise very numerous in all the northern parts of Africa ‡, from the Mediterranean sea to the river Niger ||. It is also found in
Egypt,

* The Academy having ordered the missioners sent to China, in quality of King's mathematicians, to obtain information concerning some particulars in the history of the camel, the Persian ambaffador gave the following answers to the queries put to him by M. Constance: 1. That, in Persia, there were camels with two bunches on the back; but that they came originally from Turkestan, and belong to the race of those which the King of the Moors had brought from that country, the only known part of Asia where this kind exists; and that those camels were highly esteemed in Persia, because their two bunches render them more proper for carriages. 2. That these bunches are not formed by a curvature of the back-bone, which is here as low as in any other part, but are only excrescences of a glandular substance, similar to that which composes the udders of other animals; and that the anterior bunch is about six inches high, and the posterior an inch lower; *Mem. pour servir a l'hist. des animaux, part. 1. p. 80.*

† The camels of the Calmuck Tartars are pretty large and strong; but they all have two bunches; *Relation de la Grande Tartarie, p. 267.*

‡ *Camelus animal blandum ac domesticum maxima copia in Africa invenitur, praesertim in desertis Libyae, Numidiae, et Barbariae; Leon. Afric. descript. Africae, vol. 2. pag. 748.*

|| The Moors have numerous flocks of camels upon the banks of the Niger; *Voyage au Senegal, par M. Adanson, p. 36.*

Egypt *, in Persia, in South Tartary †, and in the northern parts of India. Thus the dromedary occupies immense territories, and the camel is confined within narrow limits. The first inhabits dry and hot regions, the second, countries which are less dry and more temperate; and the whole species, including both varieties, seems to be limited to a zone of three or four hundred leagues in breadth, extending from Mauritania to China; for, on either side of this zone, it has no existence. This animal, though a native of warm climates, dreads those which are excessively hot. The species terminates where that of the elephant commences; and it can neither subsist under the burning heat of the Torrid Zone, nor under the mild air of the Temperate. It seems to be an original native of Arabia ‡; for

* Audio vero in Ægypto longe plura quam quater centum millia camelorum vivere; *Prosp. Alp. Hist. Nat. Ægypt. pars 1. pag. 226.*

† Delectantur etiam Tartari Buratskoi re pecuaria, maxime camelis, quorum ibi magna copia est, unde complures a caravannis ad Sinam tendentibus redimuntur, ita ut optimus camelus duodecim vel ad summum quindecim rubelis haberi possit; *Novissima Sinica historiam nostri temporis illustratura, &c. edente G. G. L. pag. 166.*—Tartary abounds in cattle, and particularly in horses and camels; *Voyage historique de l'Europe, tom. 7. p. 204.*

‡ Arabia is the native country of camels; for, though they are found in all places into which they have been carried, and even multiply in these places; yet there is no part of the earth where they are equally numerous; *Voyage du P. Philippe, p. 369.*—Tanta apud Arabes est camelorum copia, ut

for this is not only the country where they are most numerous, but where they thrive best. Arabia is the driest country in the world, and where water is most rare. The camel is the most sober of all animals, and can pass several days without drink *. The soil is almost every where dry and sandy. The feet of the camel are adapted for walking on sands, and the animal cannot support itself on moist and slippery ground †.

This

ut eorum pauperrimus decem ad minus camelos habeat: Multique sunt quorum quisque quatuor centum ac mille etiam numerare possit; *Prosp. Alpin. hist. Ægypt. pag. 226.*

* Without the assistance of camels, it would be extremely difficult to traverse the vast deserts of Solyma, where neither bird, wild beast, herbage, nor even a mushroom can be found, and where nothing is to be seen but mountains of sand, quarries, and camel's bones. These animals sometimes pass six or seven days without drinking, which I should never have believed, if I had not seen the fact verified; *Relation du Voyage de Poncet en Ethiopie; Lettres Edifiantes, recueil 4. p. 259.*—In going from Aleppo to Ispahan, by the great desert, we travelled near six days without finding water, which, added to the three preceding, make the nine days I formerly mentioned, during which our camels had no drink; *Voyage de Tavernier, tom. 1. p. 202.*

† Camels cannot walk upon fat or slippery ground. They are only fit for sandy places; *Voyage de Jean Ovington, tom. 1. p. 222.*—There are chiefly two kinds of camels, the one proper for warm countries, the other for cold. The camels of very warm countries, as those which come from Ormus, and as far as Ispahan, cannot walk when the ground is moist and slippery; for, by the spreading of their hind legs, they are in danger of tearing open their bellies: They are small, and carry loads of only six or seven hundred pounds. The camels of colder countries, as those from Tauris to Constantinople,

This soil produces no pasture; the ox is also wanting; and the camel supplies his place.

When we consider the nature and structure of these animals, we cannot be deceived with regard to their native country, which must be conformed to their frame and temperament, especially when these are not modified by the influence of other climates. In vain have attempts been made to multiply them in Spain*; in vain have they been transported to America. They have neither succeeded in the one country nor in the other; and, in the East Indies, they are not found beyond Surat and Ormus. We mean not to say absolutely, that they cannot subsist and produce in India, Spain, and America, and even in colder countries, as those of France, Germany, &c. †. By keeping them, during the winter, in warm stables; by feeding them well, and treating them with care; by not employing them in labour, and not allowing them to go out for exercise,

tinops, are large, and commonly carry burdens of one thousand pounds. They draw themselves out of miry ground; but, when the earth is fat and slippery, they are obliged to go, sometimes to the number of a hundred, at each others sides, in order to pass over it; *Voyage de Tavernier, tom. 1. p. 161.*

* Camels are frequently seen in Spain. They are sent, by the governours of places, from the frontiers of Africa. But they never live long there; because the country is too cold for them; *L' Afrique de Marmol, tom. 1. p. 50.*

† M. le Marquis de Montmirail informs me, that he was assured that the King of Poland had, in the neighbourhood of Dresden, camels and dromedaries which multiplied.

exercise, but in fine weather, their lives might be preserved, and we might even hope to see them produce. But such productions are rare and feeble; and the parents themselves are weak and languid. In these climates, therefore, they lose all their value, and, instead of being useful, they cost their owners much expence in the rearing. But, in their native country, they constitute the sole riches of their masters*. The Arabians regard the camel as a present from heaven, a sacred animal †, without whose assistance they could neither subsist, carry on trade, nor travel. Camel's milk is their common food. They also eat its flesh, that of the young camel being reckoned highly favourable. Of the hair of those animals, which is fine and soft, and which is completely renewed every year ‡, the Arabians make

* Ex camelis Arabes divitias ac possessiones aestimant; et si quando de divitiis principis aut nobilis cujusdam sermo fiat, possidere aiunt tot camelorum, non aureorum, millia; *Leon. Afric. descript. Africae, vol. 2. p. 748.*

† Camelos, quibus Arabia maxime abundat, animalia sancta ii appellant, ex insigni commodo quod ex ipsis indigenæ accipiunt; *Prosp. Alpin. hist. Ægypt. pars 1. p. 225.*

‡ In spring, the hair of the camel falls off so entirely, that he resembles a scalded hog. He is then smeared all over with pitch, to defend him from the flies. The hair of the camel is a fleece superior to that of any other domestic animal. In these countries, it is made into very fine stuffs, and, in Europe, hats are made of it, by mixing it with beaver's hair; *Voyage de Chardin, tom. 2. p. 28.*—In the spring, the whole hair falls from the camel in less than three days. The skin is completely naked, and then the flies become extremely troublesome, against

make stuffs for clothes, and other furniture. With their camels, they not only want nothing, but have nothing to fear †. In one day, they can perform a journey of fifty leagues into the desert, which cuts off every approach from their enemies. All the armies of the world would perish in pursuit of a troop of Arabs. Hence they never submit, unless from choice, to any power. Figure to yourselves a country without verdure, and without water, a burning sun, an air always parched, sandy plains, mountains still more adust, which the eye runs over without perceiving a single animated being; a dead earth, perpetually tossed with the winds, and presenting nothing but bones, scattered flints, rocks perpendicular or overturned; a desert totally void, where the traveller never breathes under a shade, where nothing accompanies him, nothing recalls the idea of animated Nature; absolute solitude,

more

gainst which there is no other remedy but besmearing the whole body with pitch; *Voyage de Tavernier, tom. 1. p. 162.*—Praeter alia emolumenta quae ex camelis capiunt, vestes quoque et tentoria ex iis habent; ex eorum enim pilis multa fiunt, maxime vero pannus, quo et principes oblectantur; *Prosp. Alpin. hist. Ægypt. pars 1. p. 226.*

† The camels constitute the wealth, the safety, and the strength of the Arabs; for, by means of their camels, they carry all their effects into the deserts, where they have nothing to fear from the invasion of enemies; *L'Asrique d'Ogilvy, p. 12.*—Qui porro camelos possident Arabes steriliter vivunt ac libere, utpote cum quibus in desertis agere possint; ad quae, propter ariditatem, nec reges, nec principes pervenire valent; *Leon. Afric. descript. Africae, vol. 2. p. 749.*

more dreadful than that of the deepest forests; for to man, trees are, at least, visible objects; more solitary and naked, more lost in an unlimited void, he every where beholds space surrounding him as a tomb: The light of the day, more dismal than the darkness of night, serves only to give him a clearer view of his own wretchedness and impotence, and to conceal from his view the barriers of the void, by extending around him that immense abyss which separates him from the habitable parts of the earth; an abyss, which, in vain, he would attempt to traverse; for hunger, thirst, and scorching heat, haunt every moment that remains to him between despair and death.

The Arab, however, by the assistance of his camel, has learned to surmount, and even to appropriate, these frightful intervals of Nature. They serve him for an asylum, they secure his repose, and maintain his independence. But man never uses any thing without abuse? This same free, independent, tranquil, and even rich Arab, instead of regarding his deserts as the ramparts of his liberty, pollutes them with his crimes. He traverses them to carry off slaves and gold from the adjacent nations. He employs them for perpetrating his robberies, which unluckily he enjoys more than his liberty; for his enterprises are almost always successful. Notwithstanding the vigilance of his neighbours, and the superiority of their strength, he escapes their pursuit,

suit, and carries off, with impunity, all that he ravages from them. An Arab, who gives himself up to this kind of terrestrial piracy, is early accustomed to the fatigues of travelling, to want of sleep, and to endure hunger, thirst, and heat. With the same view, he instructs, rears, and exercises his camels. A few days after their birth*, he folds their limbs under their belly, forces them to remain on the ground, and, in this situation, loads them with a pretty heavy weight, which is never removed but for the purpose of replacing a greater. Instead of allowing them to feed at pleasure, and to drink when they are dry, he begins with regulating their meals, and makes them gradually travel long journeys, diminishing, at the same time, the quantity of their aliment. When they acquire some strength, they are trained to the course. He excites their emulation by the example of horses, and, in time, renders them equally swift, and more robust †.

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* The young camels, soon after birth, are obliged to lie on the ground, with their four legs folded under their belly, for fifteen or twenty days, in order to enure them to this posture. They never lie in another position. To learn them temperance and abstinence, they are then allowed very little milk; and, by this practice, they are trained to continue eight or ten days without drinking: And, as to victuals, it is astonishing that so large an animal should live on so small a quantity of food; *Voyage de Chardin, tom. 2. p. 28.*

† The dromedary is particularly remarkable for swiftness. The Arabs say, that he can travel as far in one day as one of their best horses can do in eight or ten. The *Bekb*, who conducted us to mount Sinai, was mounted on one of these camels,

and

In fine, after he is certain of the strength, fleetness, and sobriety of his camels, he loads them both with his own and their food, sets off with them, arrives unperceived at the confines of the desert, robs the first passengers he meets, pillages the solitary houses, loads his camels with the booty, and, if pursued, he is obliged to accelerate his retreat. It is on these occasions that he unfolds his own talents and those of the camels. He mounts one of the fleetest *, conducts the troop, and makes them travel night and day, without, almost, either stopping, eating, or drinking; and, in this manner, he easily performs a journey of three hundred leagues in eight days †.

During

and often amused us with the great fleetness of the animal on which he rode. He quitted our caravan to reconnoitre another, which was so distant that we could hardly perceive it, and returned to us in less than a quarter of an hour; *Shaw's travels*.—A kind of camels are reared in Arabia for the purposes of the course. They trot so fleetly, that a horse cannot keep up with them, unless at a gallop; *Voyage de Chardin, tom. 2. p. 28.*

* The dromedaries are so fleet that they march thirty-five or forty leagues a-day, and continue at this rate for eight or ten days through the desert, and eat extremely little. They are used by the Arabs of Numidia and the Lybian Africans as post horses, when a long journey is necessary; they likewise mount these animals in the time of combat; *L'Afrique de Marmol. tom. 1. p. 49.*—The true dromedary is much lighter and swifter than the other camels; he can travel a hundred miles in a day, and continue at the same rate, across the deserts, with very little food, for seven or eight days; *L'Afrique d'Ogilby, p. 12.*

† The dromedaries are smaller, more slender, and fleet than

During this period of motion and fatigue, his camels are perpetually loaded, and he allows them, each day, one hour only of repose, and a ball of paste. They often run in this manner nine or ten days, without finding water *; and when, by chance, there is a pool at some distance, they scent the water half a league off †. Thirst makes them double their pace, and they drink as much at once as serves them for the time that is past, and as much to come; for their journeys often last several weeks, and their abstinence continues an equal time.

In

than the other camels, and are used only for carrying men. They have a fine soft trot, and easily accomplish forty leagues a-day. The rider has only to keep a firm seat; and some people, for fear of falling, are tied on; *Relation de Thevenot, tom. 1. p. 312.*

* The camel can dispense with drinking during four or five days. A small quantity of beans and barley, or rather some morsels of paste made of flour, are sufficient for his daily nourishment. This fact I often experienced in my journey to mount Sinai. Though each of our camels carried seven quintals, we travelled ten, and sometimes fifteen hours a day, at the rate of two and a half miles every hour; *Shaw's travels.* —Adeo sitim cameli tolerant, ut pota absque incommodo diebus quindecim abkinere possent. Nociturus alioquin si camelarius triduo absoluto aquam illis porrigat, quod singulis quinis aut novenis diebus consueto more potentur vel urgente necessitate quindenis; *Leon. Afric. descript. Africae, vol. 2. p. 749.* —The patience with which the camels suffer thirst is truly admirable. The last time I travelled the deserts, which the caravan did not clear in less than sixty-five days, our camels were once nine days without drink; because, during all this time, we found no water; *Voyage de Tavernier, tom. 1. p. 162.*

† We arrived at a hilly country: At the foot of the hills
were

In Turkey, Persia, Arabia, Egypt, Barbary, &c. all the articles of merchandize are carried by camels *. Of all carriages, it is the cheapest and most expeditious. The merchants and other passengers unite in a caravan, to prevent the insults and robberies of the Arabs. These caravans are often very numerous, and are always composed of more camels than men. Each camel is loaded in proportion to his strength; and, when over-loaded †, he refuses to march, and continues lying till his burden is lightened. The large camels generally carry a thousand, or even

were large pools. Our camels, which had passed nine days without drink, smelled the water at the distance of half a league. They instantly began their hard trot, which is their mode of running, and, entering the pools in troops, they first troubled the water, &c. *Tavernier, tom. 1. p. 202.*

* The camels are very commodious for carrying baggage and merchandize at a small expence.—Their steps, as well as their journeys, are regulated.—Their food is cheap; for they live on thistles, nettles, &c.—They suffer drought two or three days; *Voyage d'Olearius, tom. 1. p. 552.*

† When about to be loaded, at the cry of their conductor, they instantly bend their knees. If any of them disobey, they are instantly struck with a stick, or their necks are pulled down; and then, as if constrained, and complaining in their own manner, they bend their knees, put their bellies on the earth, and remain in this posture till they are loaded and commanded to rise. This is the origin of those large callosities on the parts of their bellies, limbs, and knees, which rest on the ground. If over-burdened, they give repeated blows with their heads to the person who oppresses them, and set up lamentable cries. Their ordinary load is double that which the strongest mule can carry; *Voyage du P. Philippe, p. 369.*

even twelve hundred * pounds weight, and the smallest from six to seven hundred †. In these commercial travels, their march is not hastened: As the route is often seven or eight hundred leagues, their motions and journeys are regulated. They walk only, and perform about from ten to twelve leagues each day. Every night they are unloaded, and allowed to pasture at freedom. When in a rich country, or fertile meadow, they eat, in less than an hour ‡, as much as serves them to ruminate the whole night, and to nourish them during twenty-four hours. But they seldom meet with such

* Some camels can carry loads of fifteen hundred pounds. But they are never burdened in this manner, unless when the merchants approach the places where the imposts on goods are levied, which they mean partly to evade, by laying as much on one camel as was carried before by two. But, with this great load, they travel not above two or three leagues a day; *Voyage de Tavernier, tom. 2. p. 335.*

† In the East, the camel is called a *land ship*, on account of the great load he carries, which, for large camels, is generally twelve or thirteen hundred pounds; for there are two kinds, *the northern* and *the southern*, as they are denominated by the Persians. The latter, who travel only from the Persian Gulf to Ispahan, are much smaller than the others, and carry only about seven hundred pounds; but they bring as much, if not more profit to their masters, because their food hardly costs any thing. They march loaded in this manner, pasturing along the road, without bridle or halter; *Voyage de Chardin, tom. 2. p. 27.*

‡ *Victum cameli parcissimum, exiguique sumptus ferunt, et magnis laboribus robustissime resistunt.*—Nullum animal huius et molis citius comedit; *Presp. Alpin. Hist. Egypt. p. 225.*

such pastures; neither is this delicate food necessary for them. They even seem to prefer wormwood, thistles *, nettles, broom, cassia †, and other prickly vegetables, to the softest herbage. As long as they find plants to browse, they easily dispense with drink ‡.

Besides, this facility of abstaining long from drink proceeds not from habit alone, but is rather an effect of their structure. Independent of the four stomachs, which are common to ruminating animals, the camels have a fifth bag, which serves them as a reservoir for water. This fifth stomach is peculiar to the camel. It is so large as to contain a vast quantity of water, where it remains without corrupting, or mixing with the other aliments. When the animal is pressed with thirst, and has occasion for water to macerate his dry food in ruminating, he makes part of this water mount into his paunch,

* When the camels are unloaded, they are allowed to go in quest of briars or brambles.—Though the camel is a large animal, he eats little, and is content with what he finds. He searches particularly for thistles, of which he is very fond; *Voyage de Tavernier, tom. 1. p. 162.*

† *Cameli pascentes spinam in Egypto acutam, Arabicamque etiam vacatam Acaciam, in Arabia Petrea, atque juncum odoratum in Arabia deserta, ubi vis absynthii species aliasque herbas et virgulta spinosa quae in desertis reperiuntur; Prosp. Alpin. Hist. Egypt. part. 1. p. 226.*

‡ When the camel is loaded, he lies on his belly, and never allows a greater burden to be put on his back than he is able to carry. If he can find herbage to eat, he can pass several days without drink; *L'Afrique d'Ogilby, p. 12.*

paunch, or even as high as the oesophagus, by a simple contraction of certain muscles. It is by this singular construction that the camel is enabled to pass several days without drinking, and to take at a time a prodigious quantity of water, which remains in the reservoir pure and limpid, because neither the liquors of the body, nor the juices of digestion, can mix with it.

If we reflect on the dissimilarities in this animal from other quadrupeds, we cannot doubt that his nature has been considerably changed by constraint, slavery, and perpetual labour. Of all animals, the camel is the most antient, the completest, and the most laborious slave. He is the most antient slave, because he inhabits those climates where men were first polished. He is the most complete slave, because, in the other species of domestic animals, as the horse, the dog, the ox, the sheep, the hog, &c. we still find individuals in a state of nature, and which have never submitted to men. But the whole species of the camel is enslaved; for none of them exist in their primitive state of liberty and independence. Lastly, he is the most laborious slave; because he has never been nourished for pomp, like most horses, nor for amusement, like most dogs, nor for the use of the table, like the ox, the hog, and the sheep; because he has always been made a beast of burden, whom men have never taken the trouble of yoking in machines, but have regarded the body of the animal as a living

living carriage, which they may load, or overload, even during sleep; for, when pressed, the load is sometimes not taken off, but he lies down to sleep under it, with his legs folded*, and his body resting on his stomach. Hence they perpetually bear the marks of servitude and pain. Upon the under part of the breast, there is a large callosity as hard as horn, and similar ones on the joints of the limbs. Though these callosities are found on all camels, they exhibit a proof that they are not natural, but produced by excessive constraint and painful labour; for they are often filled with pus †. The breast and legs, therefore, are deformed by callosities; the back is still more disfigured by one or two bunches. The callosities, as well as the bunches, are perpetuated by generation. As it is obvious, that the first deformity proceeds from the constant practice of forcing these animals, from their earliest age ‡, to lie on their stomach, with their limbs folded

* In the night, the camels sleep on their knees, and ruminate what they have eaten during the day; *Voyage du P. Philippe*, p. 369.

† Having opened the callosities on the legs to examine their structure, which is a medium between fat and ligament, we found, in a small camel, that some of them contained a collection of thick pus. The callosity on the sternum was eight inches long, six broad, and two thick. In it likewise we found a great deal of pus; *Mem. pour servir à l'hist. des animaux*, part. 1. p. 74.

‡ As soon as a camel is brought forth, his four legs are folded under his body. After which, he is covered with a cloth, which hangs down to the ground, and on the borders of

folded under the body, and, in this situation, to bear both the weight of their own bodies, and that of the loads laid on their backs, we ought to presume that the bunch or bunches have also originated from the unequal pressure of heavy burdens, which would naturally make the flesh, fat, and skin swell; for these bunches are not osseous, but composed of a fleshy substance similar to that of a cow's udder*. Hence the callosities and bunches should be equally regarded as deformities produced by continual labour and bodily constraint; and, though at first accidental and individual, they are now become permanent and common to the whole species. We may likewise presume, that the bag which contains the water, and is only an appendix to the paunch, has been produced by an unnatural extension of this viscus. The animal, after suffering thirst for a long time, by taking at once as much, and perhaps more water than the stomach could easily contain, this membrane would be gradually extended and dilated; in the same manner as we have seen the stomach of a sheep extend in proportion to the quantity of its aliment. In sheep fed with grain, the stomach is very small;

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but

of which a quantity of stones are laid, to prevent him from rising, and in this position he remains fifteen or twenty days. He is served with milk, but very sparingly, in order to accustom him to drink little; *Voyage de Tavernier, tom. 1. p. 161.*

* The flesh of the camel is insipid, especially that of the bunch, the taste of which resembles that of a fat cow's udder; *L'Afrique de Marmol, tom. 1. p. 50.*

but becomes very large in those fed with herbage alone.

These conjectures would be either fully confirmed or destroyed, if we had wild camels to compare with the domestic. But these animals no where exist in a natural state, or, if they do, no man has observed or described them. We ought to suppose, therefore, that every thing good and beautiful belongs to Nature, and that whatever is defective and deformed in these animals proceeds from the labours and slavery imposed on them by the empire of man. These inoffensive creatures must suffer much; for they utter the most lamentable cries, especially when overloaded. But, though perpetually oppressed, their fortitude is equal to their docility. At the first signal *, they bend their knees and lie down to be loaded †, which saves their conductor the trouble

* The camels are so obedient to their master, that, when he wants to load or unload them, by a single word or signal, they instantly lie down on their bellies. Their food is small and their labour great; *Cosmog. du Levant, par Thevet, p. 74.*— They are accustomed to lie down to be loaded, by having their legs folded under them when very young; and their obedience is so prompt as to excite admiration. Whenever the caravan arrives at the place of encampment, all the camels which belong to one master range themselves spontaneously in a circular form, and lie down on their four legs; so that, by loosing a cord which binds the bales, they gently fall down on each side of the animal. When the time of loading arrives, the same camel comes and lies down between the bales, and, after they are fixed, rises softly with his load. This exercise he performs in a short time, and without the smallest trouble or noise; *Voyage de Tavernier, tom. 1. p. 160.*

† The camels, when about to be loaded, lie down on their
four

trouble of raising the goods to a great height. As soon as they are loaded, they rise spontaneously, and without any assistance. One of them is mounted by their conductor, who goes before, and regulates the march of all the followers. They require neither whip nor spur. But, when they begin to be tired, their courage is supported, or rather their fatigue is charmed, by singing, or by the sound of some instrument *. Their conductors relieve each other in singing; and, when they want to prolong the journey †, they give the

four legs, and then rise with their burden; *Voyage de la Boulaie-le-Gouz*, p. 255.—The camels lie down to be loaded or unloaded, and rise when desired; *Relation de Thevenot*, tom. 1. p. 312.

* The camels rejoice at the harmonious sound of the voice, or of some instrument. . . . The Arabs use timbrels, because whipping does not make the animals advance. But music, and particularly that of the human voice, animates and gives them courage; *Voyage d'Olearius*, tom. 1. p. 552.—When their conductor wants to make his camels perform extraordinary journeys, instead of chastising, he encourages them with a song; and, though they had formerly stopt, and refused to proceed farther, they now go on cheerfully, and quicker than a horse when pushed with the spur; *L'Afrique de Marmol*, tom. 1. p. 47.—The master conducts his camels by singing, and, from time to time, blowing his whistle. The more he sings, and the louder he blows, the animals march the quicker; and, when he ceases to sing, they stop. Their conductors relieve each other by singing alternately, &c. *Voyage de Tavernier*, tom. 1. p. 163.

† It is remarkable, that the camels learn to march by a kind of singing; for they proceed quickly or slowly, according to the sound of the voice. In the same manner, when their masters want an extraordinary journey performed, they

the animals but one hour's rest; after which, resuming their song, they proceed on their march for several hours more, and the singing is continued till they arrive at another resting place, when the camels again lie down; and their loads, by unloosing the ropes, are allowed to glide off on each side of the animals. Thus they sleep on their bellies in the middle of their baggage, which, next morning, is fixed on their backs with equal quickness and facility as it had been detached the evening before.

The callosities and tumours on the breast and legs, the contusions and wounds of the skin, the complete falling off of the hair, hunger, thirst, and meagerness, are not the only inconveniences to which these animals are subjected: To all these evils they are prepared by castration, which is a misfortune greater than any they are obliged to suffer. One male is only left for eight or ten females*; and the labouring camels are generally geldings. They are unquestionably weaker than un mutilated males; but they are more tractable, and at all seasons ready for service. While the former are not only unmanageable, but almost furious †, during the rutting

they know the tunes which the animals love best to hear; *Voyage de Chardin, tom. 2. p. 28.*

* The Africans geld all their camels which are destined to carry burdens, and only one entire male is left for ten females; *L'Afrique de Marnet, tom. 1. p. 48.*

† In the rutting season, the camels are extremely troublesome. They fret and foam, and bite every person who approaches

ting season, which lasts forty days *, and returns annually in the spring †. It is then said, that they foam continually, and that one or two red vesicles, as large as a hog's bladder, issue from their mouths ‡. In this season, they eat little, attack and bite animals, and even their own masters,

proaches them, and for that reason they are muzzled; *Relation de Thevenot, tom. 2. p. 222.*—When the camels are in season, those who have the charge of them are obliged to muzzle them, and to be much on their guard; for the animals are mischievous, and even furious; *Voyage de Jean Ovington, tom. 1. p. 222.*

* The camels, in the season of love, are dangerous. This season continues forty days, and, when past, they resume their ordinary mildness; *L'Afrique de Marmol, tom. 1. p. 49.*

† The male camels, which, in all other seasons, are extremely gentle and tractable, become furious in the spring, which is the time of their copulating. Like the cats, the camels generally perform this operation during the night. The sheath of their penis then lengthens, as happens to all animals which lie much on their bellies. At all other times, it is more contracted and inclined backward, that they may discharge their urine with more ease; *Shaw's travels.*—In the month of February, the camels come in season, and the males are so furious, that they foam incessantly at the mouth; *Voyage de la Boulaie-le-Gouz, p. 256.*

‡ When the camel is in season, he continues forty days without eating or drinking; and he is then so furious, that, unless prevented, he bites every person who comes near him. Wherever he bites, he carries off the piece; and from his mouth there issues a white foam, accompanied with two bladders, which are large and blown up like the bladder of a hog; *Voyage de Tavernier, tom. 1. p. 161.*—The camels, when in season, live forty-two days without food; *Relat. de Thevenot, tom. 2. p. 222.*—Veneris furore diebus quadraginta permanent 'famis patientes;' *Leon. Afric. vol. 2. p. 748.*—In the rutting season, which lasts five or six weeks, the camel eats much less than at any other time; *Voyage de Chardin, tom. 2. p. 28.*

sters, to whom, at all other times, they are very submissive. Their mode of copulating differs from that of all other quadrupeds; for the female, instead of standing, lies down on her knees, and receives the male in the same position that she reposes, or is loaded*. This posture, to which the animals are early accustomed, becomes natural, since they assume it spontaneously in coition. The time of gestation is near twelve months †, and, like all large quadrupeds, the females bring forth only one at a birth. Her milk is copious and thick; and, when mixed with a large quantity of water, affords an excellent nourishment to men. The females are not obliged to labour, but are allowed to pasture and produce

* When the camels copulate, the female lies down in the same manner as when she is about to be loaded. Some of them go thirteen months with young; *Relation de Thevenot, tom. 2. p. 223.*—The female receives the male lying on her belly; *Voyage de Jean Ovington, p. 223.*—It is remarkable, that, when these animals copulate, the females lie on their bellies in the same manner as when they are loading. The time of their gestation is from eleven to twelve months; *Voyage de Chardin, tom. 2. p. 28.*—It is true, that the females go with young twelve months: But those who assert, that, during the time of coition, the male turns his crupper to the female, are deceived. This error proceeds from the circumstance of his discharging his urine backward by placing the penis between the two hind legs. But, in copulating, the female lies on her belly, and receives the male in that position; *Voyage de Olearius, tom. 1. p. 553.*

† The females go with young near twelve months, or from one spring to the following; *Shaw's travels.*

produce at full liberty *. The advantage derived from their produce and their milk †, is perhaps superior to what could be drawn from their working. In some places, however, most of the females are castrated ‡, in order to fit them for labour; and it is alledged, that this operation, instead of diminishing, augments their strength, vigour, and plumpness. In general, the fatter camels are, they are the more capable of enduring great fatigue. Their bunches seem to proceed from a redundance of nourishment; for, during long journeys, in which their conductor is obliged to husband their food, and where they often suffer much hunger and thirst, these bunches gradually diminish, and become so flat, that the place where they were is only perceptible by the length of the hair, which is always longer on these parts than on the rest of the back. The meagerness of the body augments in proportion as the bunches decrease. The Moors, who transport all articles of merchandise from Barbary and Numidia, as far as Æthiopia, set out with their camels well laden, which are very fat and vigorous;

* *Camelos foeminas intactas propter earum lac servant, eas omni labore solutas vagari permittentes per loca sylvestria pascentes, &c.; Prosp. Alpin. Hist. Ægypt, part. 1. p. 226.*

† Of the camel's milk, small cheeses are made, which are very dear, and highly esteemed among the Arabs; *Voyage du P. Philippe, p. 370.*

‡ The males are castrated; and the females sometimes undergo a similar operation, which renders them stronger and larger; *Wotton, p. 82.*

rous* ; and bring back the same animals ſo meagre, that they commonly ſell at a low price to the Arabs of the Deſert, to be again fattened.

We are told by the antients, that camels are in a condition for propagating at the age of three years †. This aſſertion is ſuſpicious ; for, in three years, they have not acquired one half of their growth ‡. The penis of the male, like that of the bull, is very long, and very ſlender §. During erection, it ſtretches forward, like that of all other quadrupeds ; but, in its ordinary ſtate, the ſheath is drawn backward, and the urine is diſcharged from between the hind legs ¶ ; ſo that

* When the camels begin their journey, it is neceſſary that they ſhould be fat ; for, when this animal has travelled forty or fifty days without having barley to eat, the fat of the bunches begins to diminifh, then that of the belly, and, laſtly, that of the limbs ; after which he is no longer able to carry his load. . . . The caravans of Africa, which travel to Æthiopia, never think of bringing back their camels ; becauſe they transport no heavy goods from that country ; and, when they arrive, they ſell their meagre animals ; *L'Afrique de Marmol, tom. 1. p. 49.*—Camelos macilentos, dorſique vulneribus faucios, vili pretio Deſertorum incolis ſaginandos diſvendunt ; *Leon. Afric. deſcript. Africae, vol. 2. p. 479.*

† Incipit mas et foemina coire in trimatu ; *Ariſt. Hiſt. anim. lib. 5. cap. 14.*

‡ In the year 1752, we ſaw a female camel of three years of age. . . . She had not acquired above one half of her ſtature ; *Hiſt. Nat. des Animaux, par Meſſ. Arnault de Nobleville et Salerne, tom. 4. p. 126. et 130.*

§ Though the camel is a large animal, his penis, which is at leaſt three feet long, is not thicker than the little finger of a man ; *Voyage d'Olearius, tom. 1. p. 554.*

¶ The camels diſcharge their urine backward. Perſons unacquainted

that both males and females urinate in the same manner. The young camel suckles his mother twelve months * ; but, when meant to be trained, in order to render him strong and robust in the chase, he is allowed to suck and pasture at freedom during the first years, and is not loaded, or made to perform any labour, till he is four years old †. He generally lives forty and sometimes fifty years ‡, which duration of life is proportioned to the time of his growth. There is no foundation for what has been advanced by some authors, that he lives one hundred years.

By considering, under one point of view, all the qualities of this animal, and all the advantages derived from him, it must be acknowledged that he is the most useful creature subjected to the service of man. Gold and silk constitute not the true riches of the East. The camel is the genuine treasure of Asia. He is more valuable than the elephant ; for he may be said to perform an equal quantity of labour at a twentieth

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part

unacquainted with this circumstance, are liable to have their clothes soiled with urine ; *Cosmographie du Levant, par Thevet, p. 74.*—The camel discharges his urine backward ; *Voyage de Villamont, p. 668.*

* Separant prolem a parente anniculam ; *Arist. Hist. anim. lib. 6. cap. 26.*

† The camels called *Hegin* by the Africans, are the largest ; but they are never loaded till they are four years old ; *L'Afrique de Marmol, tom. 1. p. 48.*

‡ *Camelus vivit diu, plus enim quam quadraginta annos ; Arist. Hist. anim. lib. 6. cap. 26.*

part of the expence. Besides, the whole species are under subjection to man, who propagates and multiplies them at pleasure. But he has no such dominion over the elephants, whom he cannot multiply, and the individuals of whom he conquers with great labour and difficulty. The camel is not only more valuable than the elephant, but is perhaps equal in utility to the horse, the ass, and the ox, when their powers are united. He carries as much as two mules; though he eats as little, and feeds upon herbs equally coarse, as the ass. The female furnishes milk longer than the cow*. The flesh of a young camel is as good and wholesome † as veal. Their hair is finer ‡ and more in request than the best wool. Even their excrements are useful; for sal ammoniac is made of their urine, and their dung serves

* Parit in vere, et lac suum usque eo servat quo jam conceperit; *Arist. Hist. anim. lib. 6. cap. 26.*—Foemina post partum interposito anno coit; *Id. lib. 5. cap. 14.*

† The Africans and Arabs fill their pots and tubs with camels flesh, which is fried with grease, and preserved in this manner during the whole year for their ordinary repasts; *L'Afrique de Marmol, tom. 1. p. 50.*—Praeter alia animalia quorum carnem in cibo plurimi faciunt, cameli in magno honore existunt; in Arabum principum castris cameli plures unius anni aut biennes macerantur, quorum carnes avidè comedunt, easque odoratas, suaves, atque optimas esse fatentur; *Prosp. Alpin. Hist. Ægypt. part. 1 p. 226.*

‡ Socks are made of the camel's hair; and, in Persia, fine girdles are made of it, some of which, especially when white, cost two *tomans*, because camels of this colour are rare; *Relation de Thevenot, tom. 2. p. 223.*

erves, for litter * to themselves, as well as to horses, with which people frequently travel † in countries where no hay or straw can be had. In fine, their dung makes excellent fuel, which burns freely ‡, and gives as clear and nearly as hot a flame as dry wood, which is of great use in the deserts, where 'not a tree is to be found, and where, for want of combustible materials, fire is as scarce as water §

S U P P L E M E N T.

Having little to add to what has been said with regard to the camel and dromedary, we shall

* Their own dung serves them for litter. For this purpose it is exposed to the sun during the day, and the sun dries it so completely, that it crumbles down into a kind of powder, which is carefully spread for litter; *Relation de Thevenot, p. 73.*

† The ancients tell us, without any foundation, that the camels have a great antipathy to horses. I could not learn, says Olearius, why Pliny, after Xenophon, should advance, that camels have an aversion to horses. When I mentioned it to the Persians, they laughed at me. . . . There is hardly a caravan in which there are not camels, horses, and asses, all lodged promiscuously together, without discovering the smallest aversion or animosity against each other; *Voyage d'Olearius, tom. 1. p. 553.*

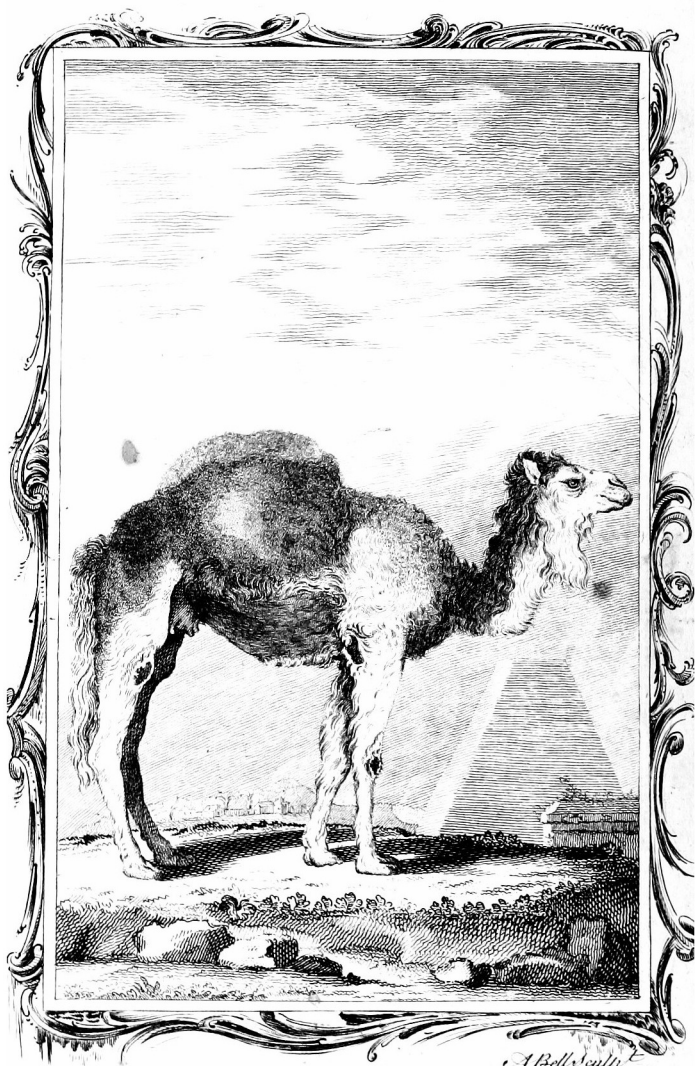
‡ The camels dung left by some caravans which had gone before us, generally served us for fuel; for, after being exposed a day or two to the sun, it is easily inflamed, and burns as clear and with as strong a heat as dried wood or charcoal; *Shaw's travels.*

§ *Hist. Nat. des animaux, par Mess. Arnault de Nobleville et Salerne, tom. 4. p. 313.*

shall content ourselves with quoting a passage from M. Niebuhr's description of Arabia, *p.* 144.

‘ In the country of Iman, most of the camels
 ‘ are of a middle stature, and of a bright brown
 ‘ colour ; some of them, however, are large,
 ‘ heavy, and of a deep brown colour. When
 ‘ about to copulate, the female lies down on her
 ‘ legs ; and the people tie her fore legs to pre-
 ‘ vent her from rising. The male sits on his
 ‘ posteriors like a dog, with his two fore feet
 ‘ resting on the ground. He seems to be cold-
 ‘ er and more indifferent than any other animal ;
 ‘ for he often requires to be teased a long time
 ‘ before the ardour of love is excited. When
 ‘ the operation is finished, the female is sudden-
 ‘ ly raised, and forced to walk. The same thing,
 ‘ it is said, takes place in Mesopotamia, Natolia,
 ‘ and probably every where else.’

I remarked, that camels had been transported to the Canaries, Antilles, and Peru ; but that they had not succeeded in any part of the New World. Dr Brown, in his history of Jamaica, affirms, that he saw dromedaries there, which the English, in former times, had transported thither in great numbers, and that, though they still subsist, they are of little use ; because the inhabitants are ignorant of the proper manner of feeding and treating these animals. They, however, multiply in all these climates, and I doubt not but they might produce even in France. We see from the Gazette of June 9. 1775, that M. Brin-
 kenof



A Bell's engraving

DROMEDARY



CAMEL

kenof having made a male and female camel copulate in his territories near Berlin, obtained on the 24th day of March 1775, after a period of twelve months, a young camel, which was healthy and vigorous. This fact confirms what I said concerning the production of dromedaries and camels at Dresden ; and I am persuaded, that, if we had Arabian servants, who know how to manage these animals, we might soon render this species domestic, which I consider as the most useful of all quadrupeds.

The

The BUFFALO*, the BONASUS†,
 the URUS‡, the BISON||, and
 the ZEBU §.

THE Buffalo, though now common in Greece,
 and domestic in Italy, was unknown
 both to the antient Greeks and Romans; for he
 has

* This animal has no name either in Greek or Latin. In modern Latin, *Bubalus*, *Buffelus*; in Italian *Bufalo*; in German, *Buffel*; at Congo, according to Dapper, *Empakassa*, or *Pakassa*; and at the Cape of Good Hope, according to Kolbe, *Gu-Aroho*.

Bos bubalus, cornibus resupinatis, intortis, antice planis;
Linn. syst. nat. p. 99.

Buffelus vel Bubalus vulgaris; *Johnston de quad. p. 38. tab. 20.*

Buffel; *Kolbe, descript du Cap de Bonne-Esperance, tom. 3. p. 25. pl. at p. 54. fig. 3.* Note. I have here quoted Johnston and Kolbe only because the figures they have given of the Buffalo are not so bad as those of other authors.

† Bonafus quoque e sylvestribus cornigeris enumerandus est; *Arist. hist. anim. lib. 2. cap. 1. . . .* Sunt nonnulla quae simul bisulca sunt, et jubam habeant et cornua bina, orbem inflexu mutuo colligentia gerant, ut bonafus, qui in Poenonia terra et Media gignitur; *Idem. Ibid. . . .* Bonafus etiam interiora omnia bubus similia continet; *Idem. lib. 2. cap. 16. . . .* Bonafus gignitur in terra Poenonia, monte Messapo, qui Poenoniae et Mediae terrae collimitium est, et Monapios a Poenonibus appellatur, magnitudine tauri, sed corpore quam bos latiore: Brevior enim et in latera auctior est. Tergus distentum ejus locum septem accubantium occupat; caetera, forma bovis similis est, nisi quod cervix jubata armorum tenuis ut equi est, sed

has no name in the languages of these people. Even the word *Buffalo* indicates a foreign origin; for it has no root either in Greek or Latin. In a word, this animal is a native of the warm regions

sed villo molliore quam juba equina et compositiore; color pili totius corporis flavus, juba prolixa et ad oculos usque demissa et frequenti colore inter cinereum et rufum, non qualis equorum quos partos vocant est, sed villo supra squallidior, subter lanario. Nigri aut admodum rufi nulli sunt. Vocem similem bovi emittunt; cornua adunca in se flexa et pugnae inutilia gerunt, magnitudine palmari, aut paulo majora, amplitudine non multo arctiore quam ut singula semi-sextarium capiant nigræ proba. Antiae ad oculos usque demissæ, ita ut in latus potius quam ante pendeant. Caret superiore dentium ordine, ut bos et reliqua cornigera omnia. Crura hirsuta atque bifurca habet; caudam minorem quam pro sui corporis magnitudine, similem bubulae. Excitat pulverem et fodit, ut taurus. Tergore contra ictus praevalido est. Carnem habet gustu suavem: Quamobrem in usu venandi est. Cum percussus est, fugit, nisi defatigatus nusquam consistit. Repugnat calcitrans et proluviem alvi vel ad quatuor passus projiciens, quo praesidio facile utitur, et plerumque ita adurit, ut pili insectantium canum absumentur. Sed tunc ea vis est in fimo, cum bellua excitatur et metuit: Nam si quiescit, nihil urere potest. Talis natura et species hujus animalis est. Tempore pariendi universi in montibus enituntur; sed priusquam foetum edant, excremento alvi circiter eum locum in quo pariunt, se quasi vallo circumdant et muniunt, largam enim quandam ejus excrementi copiam haec bellua egerit; *Idem. lib. 9. cap. 45. Traduction de Theodore Gaza.*

Bos bonafus, cornibus in se flexis, juba longissima; *Linn. syst. nat. p. 99.*

† Urus; *Cass. Jul. Caes. comment. lib. 6. c. 5.* The aurochs of the Germans.

‡ Bifon jubatus Plinii et aliorum.

Bos bison, cornibus divaricatis, juba longissima, dorso gibboso; *Linn. syst. nat. p. 99.*

regions of Africa and the Indies, and was not transported and naturalized in Italy till about the seventh century. The moderns have improperly applied to him the name *bubalus*, which, indeed, denotes an African animal, but very different from the buffalo, as might be shown from many passages of antient authors. If the *bubalus* were to be referred to a particular genus, he would rather belong to that of the antelope than to that of the ox. Belon, having seen at Cairo a small ox with a bunch on its back, which differed from the buffalo and common ox, imagined that it might be the *bubalus* of the antients. But, if he had carefully compared the characters given by the antients to the *bubalus*, with those of this small ox, he would have discovered his error. Besides, we are enabled to speak of it with certainty; for we have seen it alive; and, after comparing the description we have given of it with that of Belon, we cannot hesitate in pronouncing it to be the same animal. It was exhibited at the fair of Paris in the year 1752, under the name of *Zebu*, which we have adopted to denote this animal, because it is a particular race of the ox, and not a species of the buffalo or *bubalus*.

Aristotle,

§ Petit boeuf d'Afrique; *Obs. de Belon*, p. 118. where there is a figure of it.

Guahex in Barbary, according to Marmol; *Bekker el Wash*, that is *wild ox*, among the Arabs; *Shaw's travels*.

Aristotle, when treating of oxen, mentions not the common ox, but only remarks, that, among the *Arachotas* in India, there are wild oxen, which differ from the domestic kind as much as the wild boar differs from the common hog. But, in another place, as quoted above in the notes, he gives a description of a wild ox in Poconia, a province bordering on Macedonia, which he calls *bonafus*. Thus the common ox and the *bonafus* are the only animals of this kind mentioned by Aristotle; and, what is singular, the *bonafus*, though fully described by this great philosopher, was unknown to the Greek and Latin naturalists who wrote after him; for they have all copied him verbatim on this subject: So that, at present, we only know the name *bonafus*, without being able to distinguish the animal to which it ought to be applied. If we consider, however, that Aristotle, when speaking of the wild oxen of temperate climates, mentions the *bonafus* only, and that, on the contrary, the Greeks and Latins of after ages take no notice of the *bonafus*, but point out these wild oxen under the appellations of *urus* and *bison*, we will be induced to think that the *bonafus* must be either the one or the other of these animals; and, indeed, by comparing what Aristotle has said of the *bonafus*, with what we know concerning the *bison*, it is probable that these two names denote the same animal. The *urus* is first mentioned by Julius Caesar; Pliny and Pausanias are also

the first who announced the bison. From the time of Pliny, the name *bubalus* has been indiscriminately applied to the urus or the bison. Confusion always augments as time advances. To the bonafus, bubalus, urus, and bison, have been added the *catopleba*, the *thur*, the bubalus of Belon, the Scots and American bisons; and all our naturalists have made as many different species as they have found names. Here truth is so environed with darkness and error, that it will be difficult to elucidate this part of natural history, which the contrariety of evidence, the variety of descriptions, the multiplicity of denominations, the diversity of places, the differences of languages, and the obscurity of time, seemed to have condemned to perpetual darkness.

I shall first give my opinion on this subject, and afterwards produce the proofs of it.

1. The animal we call *buffalo* was unknown to the antients.

2. The buffalo, now domestic in Europe, is the same as the domestic or wild buffalo of India and Africa.

3. The *bubalus* of the Greeks and Romans is neither the buffalo nor the small ox of Belon, but the animal described in the Memoirs of the Academy of Sciences under the name of the *Barbary cow*, and which we call *bubalus*.

4. The small ox of Belon, which we have seen, and distinguished by the name *zebu*, is only a variety of the common ox.

5. The *bonafus* of Aristotle is the same animal with the bison of the Latins.

6. The *bison* of America might proceed originally from the European bison.

7. The *urus* or *aurochs* is the same animal with the common bull in its natural and wild state.

8. The bison differs from the aurochs by accidental varieties only; and, consequently, it is, as well as the aurochs, of the same species with the domestic ox; so that I think I shall be able to reduce all the denominations, and all the pretended species both of antient and modern naturalists, to three, namely, the ox, the buffalo, and the bubalus.

Some of the propositions I am about to lay down, will, I doubt not, appear to be mere assertions, particularly to those who have been accustomed to study the nomenclators of animals, or have attempted to give lists of them. There are none of these assertions, however, which I am not able to prove. But, before entering into critical discussions, each of which requires particular propositions, I shall relate the facts and remarks which led me into this research; and, as they have satisfied myself, I hope they will be equally satisfactory to others.

Domestic animals differ, in many respects, from wild animals. Their nature, their size, and their form are more fluctuating, and subject to greater changes, especially in the external parts

parts of the body. The influence of climate, which acts powerfully upon all Nature, exerts itself with greater efficacy upon captive than upon free animals. Food prepared by the hand of man, which is often ill chosen, and sparingly administered, joined to the inclemency of a foreign sky, produce, in the progress of time, alterations so deeply engraven that they become constant, and are transmitted to posterity. I pretend not to maintain, that this general cause of change is so powerful as to alter essentially the nature of beings, whose constitution is so permanently fixed as that of animals. But it transforms and masks their external appearance; it annihilates some parts, and gives rise to others; it paints them with various colours; and, by its action on the temperament of the body, it has an influence on the dispositions, instincts, and other internal qualities. The modification of a single part, in a machine so perfect as that of an animal's body, is sufficient to make the whole feel the effects of the alteration. It is for this reason that our domestic animals differ nearly as much in dispositions and instincts, as in figure, from those who enjoy their natural state of freedom. Of this the sheep affords a striking example. This species, in its present condition, could not exist without the care and defence of man: It is also much changed, and very inferior to its original species. But, not to depart from our chief object, we see how many alterations the ox has undergone,

undergone, from the combined effects of climate, food, and management, in a wild, and in a domestic state.

The bunch which some oxen carry between their shoulders, both in a domestic and wild state, is the most general and most remarkable variety. This race of oxen are denominated *bijons*; and, it has been imagined, till now, that they were of a different species from the common ox. But, as we are certain that these animals produce with the common kind, and that the bunch diminishes from the first generation, and disappears in the second or third, it is evident, that this bunch is only an accidental and variable character, which prevents not the bunched ox from belonging to the same species with our ox. Now, in the desert parts of Europe, there were, in antient times, wild oxen, some of them with bunches, and others without bunches. Hence this variety seems to be natural, and to proceed from the abundance and more substantial quality of the food; for we remarked, when treating of the camels, that, when meagre and ill fed, they have not even the least vestige of a bunch. The ox without a bunch was called *vrochs* and *turochs* in the language of the Germans, and, in the same language, the bunched ox was called *vifen*. The Romans, who knew neither of these wild oxen till they saw them in Germany, adopted their German names. From *vrochs* they made *vrus*, and from *vifen*, *bison*. They never
imagined

imagined that the wild ox described by Aristotle, under the name of *bonafus*, could be one or other of these oxen whose names they had Latinized.

The length of the hair is another difference between the aurochs and bison. The neck, the shoulders, and the throat of the bison, are covered with very long hair. But, in the aurochs, all these parts are covered with short hair, similar to that on the rest of the body, except the front, which is covered with crisped hair. This difference of the hair, however, is still more accidental than that of the bunch, and depends likewise on the food and the climate, as we have proved under the articles Goat, Sheep, Dog, Cat, Rabbit, &c. Thus, neither the bunch, nor the difference in the length of the hair, are specific characters, but accidental varieties only.

A more extensive variety than the other two arises from the figure of the horns; to which character naturalists have ascribed more importance than it deserves. They have not considered, that, in our domestic cattle, the figure, the size, the position, the direction, and even the number of the horns vary so greatly, that it is impossible to ascertain what is the real model of Nature. In some cows, the horns are much crooked, and hang so low as to be almost pendulous; in others, they are more erect, longer, and more elevated. There are entire races of ewes with sometimes two, sometimes four horns; and there

there are races of cows without horns. These external, or, as they may be called, accessory parts of the body, are as fluctuating as the colours of the hair, which, in domestic animals, are varied and combined in every possible manner. This difference in the figure and direction of the horns, which is so frequent, ought not, therefore, to be regarded as a distinctive character of species. It is, however, the only character which our naturalists have adopted in their species; and, as Aristotle, in his description of the *bonafus*, says, that its horns bended inwards, they have, from this consideration alone, and without having ever seen the individual, separated it from the rest, and made it a distinct species. In this variation of the horns of domestic animals, we have confined our remarks to cows and ewes; because the females are always more numerous than the males; and we every where see thirty cows or ewes for one bull or ram.

The mutilation of animals by castration seems to injure the individual only, and to have no influence on the species. It is certain, however, that this practice restrains Nature on the one hand, and weakens her on the other. A single male, obliged to serve thirty or forty females, must be enfeebled; besides, the ardour of love is unequal. It is cool in the male, who exerts himself beyond the bounds of Nature, and too ardent in the female, whose enjoyment is limited

ed to an infant. Of course, the offspring must be chiefly tinged with the feminine qualities; more females will be produced than males; and even the males will partake more of the mother than the father. This is unquestionably the reason why more girls than boys are brought forth in those countries where the men have a great number of wives. On the contrary, in all countries where the men are allowed but one wife, more males are produced than females. It is true, that, in domestic animals, the finest males are selected to become the fathers of an offspring so numerous. The first productions from these males will be strong and vigorous. But, in proportion to the number of copies taken from the same mould, the original impression of Nature will be deformed, or at least rendered less perfect. The race must, therefore, degenerate and become more feeble. This, perhaps, is the reason why more monsters are produced among domestic than wild animals, where the number of males is equal to that of the females. Besides, when one male is obliged to serve many females, they have not the liberty of following their own taste. They are deprived of that gaiety, and those soft emotions which proceed from spontaneous pleasures. The fire of their love is half extinguished; and they languish, waiting for the cold approaches of a male whom they have not selected, who is often not accommodated to them, and who always flatters less than one that

is obliged to caress, in order to obtain a preference. These melancholy and tasteless amours must give rise to productions equally dismal and insipid; beings who never have that courage, spirit, and strength, which Nature can only bestow on each species, by leaving all the individuals in full possession of their powers, and, above all, of the liberty of choice in the rencounters between the sexes. We learn from the example of horses, that crossed races are always the most beautiful. We ought not, therefore, to confine our female cattle to a single male of their own country, who already has too much resemblance to his mother, and who, consequently, instead of improving, continues to degrade the species. Man, in this article, prefers his convenience to every other advantage. We never think of improving or of embellishing Nature; but we submit to her operations, that we may enjoy her in a more arbitrary manner. The males constitute the glory of each species. They have more courage, fire, and obstinacy. A great number of males in our flocks would render them less tractable, and more difficult to manage. In those slaves of the most abject kind, it is even necessary to depress every head that offers to exalt itself.

To these causes of degeneration in domestic animals, we must still add another, which alone has produced more changes than all the combined force of the others; I mean, the constant

transportation of those animals from climate to climate. The ox, the sheep, the goat, have been carried to every habitable part of the globe. These species have been subjected to the influence of every climate, and have received impressions from every soil and every sky; so that it has become extremely difficult, amidst the number of changes they have undergone, to recognise those which are least removed from the prototype of Nature.

Having pointed out the general causes of the varieties among domestic animals, I shall now exhibit the particular proofs of what I advanced concerning the oxen and buffalos.

1. I remarked, *That the animal we now know by the name of buffalo, was unknown to the antient Greeks and Romans.* This position is evident; for in none of their authors is there any description, or even name, which can be applied to the buffalo. Besides, we learn from the annals of Italy, that the first buffalo was transported thither about the end of the sixth century*.

2. *The buffalo, now domestic in Europe, is the same with the wild or domestic buffalo of India and Africa.* Of this no other proof is necessary than a comparison of our description of the buffalo, which was made from the live animal, with the notices given by travellers of the buffalos in Persia †, Mogul ‡, Bengal ||, Egypt,

* Ann. 595. Voyage de Miffon, tom. 3. p. 54. † Voyage de Tavernier, tom. 1. pag. 41. et 298. ‡ Relation de Thevenot, page 11. § Voyage de l'Hullier, page 30.

Egypt *, Guiney †, and the Cape of Good Hope ‡. It is easy to perceive, that, in all these countries, this animal is the same, and differs from our buffalo only by very slight varieties.

3. *The bubalus of the Greeks and Latins is neither the buffalo, nor the small ox of Belon, but the animal described in the Memoirs of the Academy of Sciences, under the name of the Barbary Cow.* The following facts will prove this position. Aristotle || ranks the bubalus with the stag and fallow deer, and not with the ox §. In another place, he mentions the bubalus along with the roe deer; and remarks, that he makes a bad defence with his horns, and that he flies from all ferocious animals. Pliny |||, speaking of the wild oxen of Germany, says, that it is only from ignorance that the vulgar give the name

* Descript. de l'Egypte, par Maillet, tom. 2. pag. 121.

† Voyage de Bosman, pag. 437.

‡ Description du cap de Bonne-esperance, par Kolbe, tom. 3. p. 25.

|| Genus id fibrarum cervi, damae, bubali sanguini decit; *Arist. Hist. Anim. lib. 3. cap. 6.*

§ Bubalis etiam capreisque interdum cornua inutilia sunt: Nam etsi contra nonnulla resistant, et cornibus se defendant, tamen feroces pugnacesque belluas fugiunt; *Idem, de part. animal, lib. 3. cap. 11.*

||| Germania gignit insignia bouum ferorum genera, juba-tos bifontes excellentique vi et velocitate uros quibus imperitum vulgus *bubalorum* nomen imposuit; cum id gignat Africa; vituli potius cervive quadam similitudine; *Plin. Hist. Nat. lib. 8. cap. 15.*

name of *bubalus* to these oxen; for the *bubalus* is an African animal, which resembles, in some measure, a calf or a stag. Hence the *bubalus* is a timid creature, his horns are useless to him, and, to avoid the assaults of ferocious animals, he has no other resource but flight; of course, he is nimble, and is related, by his figure, both to the cow and the stag. All these characters, none of which apply to the buffalo, are combined in the animal whose figure was sent by Horatius-Fontana to Aldrovandus *, and of which the Gentlemen of the Academy † have likewise given a figure and description, under the name of the *Barbary cow*; and they agree with me in thinking, that it is the *bubalus* of the antients ‡. The zebu, or small ox of Belon, has none of the characters of the *bubalus*; for the zebu differs as much from the *bubalus* as the ox from the antelope; and Belon is the only naturalist who regarded this small ox as the *bubalus* of the antients.

4. *The small ox of Belon is only a variety of the common ox.* This may be easily proved by simply referring to the figure of this animal given by Belon, Prosper Alpinus, and Edwards, and to our own description of it. We have seen it alive: Its conductor told us, that it came from
Africa,

* Aldrov. de quad. bifulc. p. 365.

† Mem. pour servir à l'hist. des animaux, part. 2. p. 24.

‡ This animal should rather be regarded as the *bubalus* of the antients, than the small African ox described by Belon; *Id. ibid.* p. 26.

Africa, where it was called *zebu*; that it was domestic, and was used for riding. It is, indeed, a very mild, and even a careffing animal. Its figure, though thick and squat, is agreeable. It has, however, so perfect a resemblance to the ox, that I can give no better idea of it, than by remarking, that, if a handsome bull were viewed through a glass which diminished objects one half, this contracted figure would be that of the zebu.

The description I made of this animal, in the year 1752, is inserted below in the note *.
It

* This small ox has a perfect resemblance to that of Belon. Its crupper is round, and plumper than that of the common ox. It is so gentle and familiar, that it licks the hand like a dog, and caresses every person who approaches. It is a very beautiful animal; and its intelligence seems to be equal to its docility. We were informed by its conductor, that it was brought from Africa, and that its age was twenty-one months. Its colour was white, mixed with yellow and a little red. All the legs were white. The hair on the spine of the back, for about a foot wide, is black, and the tail of the same colour. In the middle of this black band, there is on the crupper a small white streak, the hairs of which stand erect like bristles. It had no mane, and there was very little hair on the tuft. The hair of the body is very smooth and short. It was five feet seven inches in length, from the end of the muzzle to the origin of the tail, five feet one inch in circumference behind the fore legs, five feet six inches at the middle of the body, and five feet one inch above the hind legs. The circumference of the head, taken before the horns, was two feet ten inches, and that of the muzzle, taken behind the nostrils, was one foot three inches. The fissure of the mouth, when shut, was eleven inches. The nostrils were two inches long by one broad; and, from the end of the
muzzle

It corresponds very well with the figure and description * given by Belon, which I have also inserted,

muzzle to the eye measured ten inches. The eyes were distant from each other about six inches; and from their posterior angle, to the aperture of the ears, measured four inches. The ears were situated behind and a little to one side of the horns, and were near seven inches long, and nine inches in circumference at the base. The distance between the horns was little more than four inches; they were one foot two inches in length, six inches in circumference at the base, and, at half an inch from the points, only an inch and a half. They were of the ordinary colour of horn, and black near the extremities, which were distant from each other one foot seven inches. The bunch, which consisted entirely of flesh, was seven inches in perpendicular height. The colour of the hair which covered it was blackish, and an inch and a half long. The tail, to the end of the vertebrae, was little more than two feet long; but, including the hair, which hangs down to the ground, it was two feet ten inches and a half. The longest hairs of the tail measured one foot three inches. The testicles were a foot and a half distant from the anus. It had four paps, situated like those of the bull.

* This is a very small bull; it is thick, fat, smooth, and well shaped. . . . It was already old, though its body was not so large as that of a stag; but it was more squat, and thicker than a roebuck, and so neat and compact in all its members, that it was extremely agreeable to behold. . . . Its feet resembled those of the ox; and its legs were short and squat. Its neck is thick and short, and the dewlap very small. It has the head of an ox, and the horns rise from a bone on the top of the head. They are black, much notched, like those of the Gazelle, or Barbary antelope, and formed like a crescent. . . . It has the ears of a cow; its shoulders are plump, and a little elevated; its tail is long, and covered with black hair. It has the appearance of an ox, only it is not so tall. . . . We have here given a figure of it.—Belon adds, that this small ox was brought to Cairo from Azamia, a province of Asia, and that it is also found in Africa; *Obs. de Belon, fol. 118.*

inserted, that the reader may have an opportunity of comparing them. Prosper Alpinus *, who describes this animal, and gives a figure of it, says that it is found in Egypt. His description agrees with mine, and also with Belon's. The only differences between the three are in the colour of the horns and hair. The zebu of Belon was yellow on the belly, brown on the back, and had black horns. That of Prosper Alpinus was red, marked with small spots, with horns of the ordinary colour. Ours was of a pale yellow, almost black on the back, with horns of the same colour as those of a common ox. In the figures of Belon and Prosper Alpinus, the bunch on the back is not sufficiently marked. The opposite error takes place in the figure which Mr Edwards † has lately given of this animal, from a drawing communicated to him by Sir Hans Sloane; for the bunch is too large. Besides, the figure is incomplete; for it seems to have been drawn from a very young animal, whose horns were only beginning to shoot. It came, says Mr Edwards, from the East Indies, where these small oxen are used as we do horses. From all these hints, and likewise from the varieties in the colour, and the natural mildness of this animal, it is apparent, that it belongs to the bunched race of oxen, and has derived its origin from a domestic state, in which the smallest individuals

* Prosp. Alpin. Hist. Nat. Ægypt. p. 233.

† Nat. Hist. of Birds, p. 200.

dividuals have been chosen for a breed; for, in general, we find, that the bunched oxen in a domestic state, like our own domestic kind, are smaller than those in a wild state. These facts shall afterwards be fully confirmed by the testimonies of travellers.

5. *The bonafus of Aristotle is the same animal with the bison of the Latins.* This proposition cannot be proved, without a critical discussion, with which I will not fatigue the reader*. Gefner, who was a man of literature as well as a naturalist, and who thought, as I do, that the bonafus might probably be the bison, has examined the notices given of the bonafus by Aristotle with more care than any other person; he has, at the same time, corrected several erroneous expressions in Theodore Gaza's translation; which errors, however, have been servilely copied by all the succeeding naturalists. From these assistances, and by rejecting from the remarks of Aristotle whatever is obscure, contradictory, or fabulous, the following seems to be the result. The bonafus is a wild ox of Pœonia, and is as large, and of the same figure with the domestic ox. But his neck, from the shoulders to the eyes, is covered with long hair, which

* Here it is necessary to compare what Aristotle has said of the bonafus. (*Hist. anim. lib. 9. cap. 45.*) with what he elsewhere remarks, (*lib. de Mirabilibus*) and likewise the particular passages in his *hist. anim. lib. 2. c. 1. & 16.* and also to read Gefner's dissertation on this subject; *Hist. quad. p. 131.*

which is softer than the mane of a horse. He has the voice of an ox. His horns are short, and bended down round the ears. His legs are covered with long hair, as soft as wool; and his tail is short in proportion to his size, though in every other respect it is similar to that of the ox. Like the bull, he has the habit of raising the dust with his feet. His skin is hard, and his flesh tender and good. From these characters, which are all that can be collected from the writings of Aristotle, we see how nearly the bonafus approaches to the bison. Every article, indeed, corresponds, except the form of the horns, which, as was formerly remarked, varies considerably in animals that belong to the same species. We have seen horns bended in the same manner, which were taken from a bunched ox of Africa; and we shall afterwards prove, that this bunched ox is nothing but the bison. What I now advance may likewise be confirmed by the testimonies of ancient authors. Aristotle calls the bonafus a Poenian ox; and Pausanias*, speaking of the Poenian bull, says, in two different places, that these bulls are bisons. He likewise tells us, that the Poenian bulls, which he saw at the Roman shews, had very long hair on the breast, and about the jaws. Lastly, Julius Caesar, Pliny, Pausanias, Solinus, &c. when speaking of wild oxen, mention the aurochs and the bison, but take no notice of the bonafus. We must, therefore, sup-

* Pausan. in Beoticis et Phocicis.

pose that, in the course of four or five centuries, the species of *bonafus* has been lost, unless we allow that the terms *bonafus* and *bifon* denote only the same animal.

6. *The bifon of America might proceed originally from the European bifon.* The foundation of this opinion has already been laid in our dissertation on the animals peculiar to the two Continents *. It was from the experiments of M. de la Nux that we derived much information on this subject. From him we learn, that the bifons, or bunched oxen of India and Africa, produce with the European bulls and cows, and that the bunch is only an accidental character, which diminishes in the first generation, and totally disappears in the second or third. Since the Indian bifons are of the same species with our oxen, and, of course, have the same origin, is it not natural to extend this origin to the American bifon? In support of this supposition, every thing seems to concur. The bifon appears to be a native of cold and temperate regions. His name is derived from the German language. The antients tell us, that he was found in that part of Germany which borders upon Scythia †; and there are still bifons in the northern parts of Germany, in Poland, and

* See vol. 5. of this work.

† *Paucissima Scythia gignit animalia, inopia fructus, pauca contermina illi Germania, insignia tamen boum ferorum genera, jubatos bifontes; Plin. Hist. nat. lib. 8. cap. 15.*

and in Scotland. Hence they might pass to America, or come from that country, as they are animals common to both Continents. The only difference between the European and American bisons is, that the latter are smaller. But even this difference is a farther proof that they belong to the same species; for it was formerly remarked, that, in general, both the domestic and wild animals, which have spontaneously passed, or have been transported into America, have uniformly diminished in size. Besides, all the characters, not excepting the bunch and the long hair on the anterior parts of the body, are the same in the American and European bisons. Hence these animals must be regarded as not only of the same species, but as proceeding from the same race*.

7. *The urus, or aurochs, is the same animal with the common bull in its natural and wild state.* This position is evident from the figure of the aurochs, and its whole habit of body, which are perfectly similar to those of our domestic

* Several persons of note have reared small oxen and wild cows, which are found in Carolina, and in other countries as far south as Pennsylvania. These small oxen are tamed; but they still retain so much of their natural ferocity, that they pierce through every hedge which opposes their passage. Their heads are so strong, that they overturn the palisades of their inclosures, to come at the cultivated fields, where they do much mischief; and, as soon as a passage is opened, they are followed by the whole flock of domestic cattle. These two kinds couple together, and have given rise to an intermediate kind; *Voyage de Pierre Kalm, p. 350.*

meftic bull. The aurochs, like every other animal that enjoys liberty, is only larger and ftonger. The aurochs is ftill found in fome northern provinces: The young aurochs have fometimes been carried off from their mothers, and, after being reared to maturity, they produced with our domeftic bulls and cows*. Hence, thofe animals muft unquestionably belong to the fame fpecies.

8. *Laftly, The bifton differs from the aurochs by accidental varieties only; and, confequently, it is, as well as the aurochs, of the fame fpecies with the domeftic ox.* The bunch, the length and quality of the hair, and the figure of the horns, are the fole characters by which the bifton can be diftinguifhed from the aurochs. But we have feen the bunched oxen produce with the common domeftic kind; we likewise know, that the length and quality of the hair, in all animals, depend on the nature of the climate; and we have remarked, that, in the ox, fheep, and goat, the form of the horns is various and fluctuating. Thefe differences, therefore, are by no means fufficient to conftitute two diftinct fpecies: And, fince our domeftic cattle produce with the bunched Indian oxen, they would likewise undoubtedly produce with the bifton or bunched ox of Europe. Among the almoft innumerable varieties of thefe animals in different climates,

* Epift. ant. Schmebergensis, ad Gefnerum, *Hift. quadr.*
p. 141.

climates, there are two primitive races, both of which have long continued in a natural state, the bison or bunched ox, and the aurochs, or ox without a bunch. These two races have subsisted either in a wild or domestic state, and have been diffused, or rather transported by men into every climate of the globe. All the domestic oxen without bunches have proceeded originally from the aurochs, and all the bunched oxen have been derived from the bison. To obtain a just idea of these varieties, we shall give an enumeration of them as they exist in different parts of the world.

To begin with the north of Europe, the small bulls and cows of Iceland *, though they belong to the same race with our oxen, are deprived of horns. The magnitude of these animals depends more on the abundance and quality of their pasture, than on the nature of the climate. The Dutch † bring meager cattle from Denmark, which fatten prodigiously in their rich meadows, and give a great quantity of milk. These Danish cattle are much larger than ours. The cows and bulls of the Ukraine, where the pasture is excellent, are reckoned to be the largest in Europe,

* *Islandi domestica animalia habent vaccas, sed multae sunt mutilae cornibus; Dithmar Blesken. Island. pag. 49.*

† About the month of February, vast numbers of meager cows are brought from Denmark, which the Dutch peasants turn into their meadows. They are much larger than those of France; and each of them yields from eighteen to twenty Paris pints of milk a day; *Voyage hist. de l'Europe, tom. 5. p. 77.*

rope †, and are of the same race with the common kind. In Switzerland, where the tops of the the first mountains are covered with verdure and flowers, and are solely destined for the feeding of cattle, the oxen are nearly double the size of those in France, where they are commonly fed upon gross herbage, which is despised by the horses. During winter, bad hay and leaves are the common food of our oxen; and, in spring, when they stand in need of being recruited, they are excluded from the meadows. Hence they suffer more in spring than in winter; for they then hardly receive any thing in the stable, but are conducted into the highways, into fallow grounds, or into the woods, and are always kept at a distance from fertile land; so that they are more fatigued than nourished. Lastly, in summer, they are permitted to go into the meadows, which are then eat up, and parched with drought. During the whole year, therefore, these animals are never sufficiently nourished, nor receive food agreeable to their nature. This is the sole cause which renders them weak, and of a small size; for, in Spain, and in some districts of our provinces, where the pasture is good, and reserved for oxen alone, they are much larger and stronger.

In

† In the Ukraine, the pasture is so excellent, that the cattle are much larger than in any other part of Europe. It requires a man above the middling stature to be able to lay his hand on the middle of an ox's back; *Relat. de la Grande Tartarie*, p. 227.

In Barbary *, and most parts of Africa, where the lands are dry, and the pasture poor, the oxen are still smaller, the cows give much less milk than ours, and most of them lose their milk with their calves. The same remark applies to some parts of Persia †, of Lower Æthiopia ‡, and of Great Tartary §; while, in the same countries, and at no great distances, as in Calmuck

* In the kingdom of Tunis and Algiers, the oxen and cows, generally speaking, are not so large as those of England. After being well fattened, the largest of them seldom weigh above five or six hundred pounds. The cows give very little milk, and it commonly dries up when their calves are taken from them; *Shaw's Travels*——*Boves domestici*, quot-quot in Africae montibus nascuntur, adeo sunt exigui, ut aliis collati, vituli biennes appareant, monticolae tamen illos aratro exercentes tum robustos, tum laboris patientes asserunt; *Leon. Afric. Africae Descript. tom. 2. pag. 753.*—The cows of Guiney are dry and meager. . . . Their milk is so poor and scanty, that twenty or thirty of them are hardly sufficient to serve the general's table. These cows are very small and light; one of the best of them, when full grown, weighs not above two hundred and fifty pounds, though, in proportion to its size, it ought to weigh one half more; *Voyage de Bofman, p. 236.*

† The people of Caramania, at a little distance from the Persian Gulf, have some goats and cows; but their horned cattle are not stronger than calves, or Spanish bulls of a year old; and their horns exceed not a foot in length; *Ambassade de Silva Figueroa, p. 62.*

‡ In the province of Guber in Æthiopia, a number of large and small cattle are reared; but their cows are not larger than our heifers; *L' Afrique de Marmol, tom. 3. p. 66.*

§ At Krasnojarsk, the Tartars have a number of cattle; but a Russian cow gives twenty times as much milk as one of theirs; *Voyage de Gmelin à Kamtschatka.*

muck Tartary *, in Upper Æthiopia †, and in Abyffinia ‡, the oxen are of a prodigious fize. Hence this difference depends more on the quantity of food than on the temperature of the climate. In the northern and temperate, as well as in the warm regions, we find, at very inconsiderable diftances, large or small oxen, according to the quantity and quality of the pasture they have to feed upon.

The race of aurochs, or of the ox without a bunch, occupies the frozen and temperate zones, and is not much diffused over the southern regions. The race of the bifon, or bunched ox, on the contrary, occupies all the warm climates. In the whole continent of India ||, in the eastern and

* The oxen, in the provinces occupied by the Calmuck Tartars, are still larger than those of the Ukraine, and taller than in any other part of the world; *Relat. de la Grande Tartarie*, p. 228.

† In Upper Æthiopia, the cows are as large as camels, and without horns; *L'Afrique de Marmol*, tom. 3. p. 157.

‡ The riches of the Abyffinians consist chiefly in cows. . . . The horns of the oxen are so large, that they hold twenty pints. They are used by the Abyffinians for pitchers and bottles; *Voyage d'Abyffinie du P. Lobo*, tom. 1. p. 57.

|| The oxen which draw coaches in Surat are white, of a good fize, and have two bunches like those of certain camels. They run and gallop like horses, and are garnished with splendid housing, and a number of small bells fixed to their necks. When the animals are in motion, the bells are heard at a considerable distance, and their noise in the streets is very agreeable. These coaches are used not only in the cities of India, but in travelling through the country; *Voyage de Pietro della Valle*, tom. 6. p. 273.—The carriages of the Mogul are

and southern islands *, throughout all the regions of Africa †, from Mount Atlas to the Cape

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are a kind of coaches with two wheels. They are drawn by oxen, which, though naturally heavy and slow in their movements, acquire, by long habit, such a dexterity in drawing these carriages, that no other animal can outrun them. Most of these oxen are very large, and have a bunch between their shoulders, which rises to the height of six inches; *Voyage de Jean Ovington, tom. 1. p. 258.*—The oxen of Persia are like our own, except on the frontiers of India, where they have a bunch on the back. Few oxen are eaten in this country: They are reared chiefly for labouring the ground, or for carrying burdens. Those employed in carrying loads are shod, on account of the stony mountains they have to pass; *Voyage de Charain, tom. 2. p. 28*—The oxen of Bengal have a kind of bunch on the back. We found them as fat and as well tasted as in any other country. The largest and best sell at two rix dollars only; *Voyage de la Compagnie des Indes de Hollande, tom. 3. p. 270.*—The oxen of Guzarat are shaped like ours, except that they have a bunch between the shoulders; *Voyage de Mandelsto, tom. 2. p. 234.*

* In the island of Madagascar, an immense number of oxen are reared: They are very different from those of Europe, each of them having a bunch of fat on their backs, in the form of a wen, which has made some authors alledge that they are suckled by camels. There are three kinds, namely, those which have horns, those which have pendulous horns attached to the skin, and those which have no horns, but only a small osseous eminence, in the middle of their front, covered with skin. The last kind fail not, however, to combat other bulls, by striking their bellies with their heads. They all run like our stags, and have longer legs than those of Europe; *Voyage de Flacourt, p. 3.*—The oxen in the island of Johanna, near the Mosambique coast, differ from ours. They have a fleshy crescent between the neck and back. This portion of flesh is preferred to the tongue, and is as well tasted as the marrow; *Grosse's Travels, p. 42.*

† The oxen of Aguada-Sanbras are likewise larger than those

of Good Hope*, there are almost no oxen without bunches. It even appears that this race, which is diffused over all the warm countries, has several advantages over the other; for, like the bison, from which they have proceeded, these bunched oxen have softer and more glossy hair than ours, whose hair, like that of the aurochs, is hard, and thinly spread over the body. They are likewise swifter, more proper for supplying the place of the horse †, and, at the same time,

those of Spain. They have bunches, but no horns; *Premier voyage des Hollandois aux Indes Orientales, tom. 1, p. 218.*—The Moors have numerous flocks on the banks of the Niger. . . . Their oxen are much thicker, and have longer legs than those of Europe. They are remarkable for a large fleshy wen, which rises between their shoulders more than a foot high. This wen is a delicious morsel; *Voyage au Senegal, par M. Adanson, p. 57.*

* At the Cape of Good Hope, there are three kinds of oxen, which are all large, and very swift. Some of them have a bunch on the back; others have pendulous horns; and others have horns like those of the European kind; *Voyage de François le Guat, tom. 2. p. 147.*

† As the oxen in India are perfectly gentle, many people travel on them as we do on horses. Their common pace is soft. Instead of a bit, a small cord is passed through the cartilage of their nostrils, which is tied to a larger cord, and serves as a bridle; and this bridle is fixed to the bunch on the fore part of the back, which is wanting in our oxen. They are saddled like horses, and, when pushed, move as briskly. These animals are used in most parts of India; and no other are employed in drawing carts and chariots. They are fixed to the end of the beam by a long yoke, which is placed on the necks of the two oxen; and the driver holds the rope to which the cord that passes through the nostrils is tied; *Relation de Thevenot, tom. 3. p. 151.*—This Indian Prince was seated

on

time, not so stupid and indolent as our oxen. They are more tractable and intelligent *, and have more of those relative feelings from which advantage may be derived. They are likewise treated with more care than our best horses. The respect the Indians entertain for these

on a chariot drawn by two white oxen, with short necks, and bunches on their shoulders; but they were as swift and alert as our horses; *Voyage d'Olearius, tom. 1. p. 458.*—The two oxen which were yoked to my coach cost near 600 roupees. This price need not astonish the reader; for some of these oxen are very strong, and perform journeys of sixty days, at the rate of from twelve to fifteen leagues a day, and always at a trot. When one half of the day's journey is finished, each of them is supplied with two or three balls of the size of a penny loaf, made of flour kneaded with butter and black sugar; and, at night, their common food is chick-peas bruised, and steeped for half an hour in water; *Voyage de Tavernier, p. 36.*—Some of these oxen follow the horses at a smart trot. The smallest are the most nimble. The Gentoos, and particularly the Banians and merchants of Surat, use these oxen for drawing their carriages. It is remarkable, that, notwithstanding their veneration for these animals, the people scruple not to employ them in such laborious services; *Grosse's travels, p. 253.*

* In the country of Camandu in Persia, there are many oxen entirely white, with small blunt horns, and bunches on their backs. They are very strong, and carry heavy burdens. When about to be loaded, they lie down on their knees like the camels, and rise again when the goods are properly fastened. To this practice they are trained by the natives; *Description de l'Inde, par Marc Paul, liv. 1. chap. 22.*—The European labourers prick their oxen with a goad, in order to make them advance. But, in Bengal, their tails are only twisted. These animals are extremely tractable. When loading, they are instructed to lie down, and to rise with the burdens on their backs; *Lett. Edif. recueil 9. p. 422.*

these animals is so great *, that it has degenerated into superstition, which is the ultimate step of blind veneration. The ox, being the most useful animal, has appeared to them to merit the greatest reverence. This venerable object they have converted into an idol, a kind of beneficent and powerful divinity; for every thing we respect must be great, and have the power of doing much good, or much evil.

These bunched oxen vary perhaps more than ours in the colour of the hair and the figure of their horns. The most beautiful are white, like those of Lombardy †. Some of them have no horns; the horns of others are very high, and in others they are almost pendulous. It even appears that this first race of bisons, or bunched oxen, should be divided into two secondary races, the one large, and the other small, which last comprehends the zebu. Both
are

* The Queen is attended with the ladies of fashion, and the pavement or roads through which she passes are strewed with the dung of the cows formerly mentioned. These people have such a veneration for their cows, that they are allowed to enter the King's palace, and are never stopped on their passage, wherever they choose to go. The King and all the nobles give place to these cows, as well as to the bulls and oxen, with every possible mark of respect and veneration; *Voyage de François Pyrard, tom. 1. p. 449.*

† All the cattle of Italy are gray or white; *Voyage de Burnet, part. 2. p. 12.*—The oxen of India, and especially those of Guzarat and of Cambaya, are generally white like those of Milan; *Grosse's travels, p. 253.*

are found nearly in the same climates *, and are equally gentle and easily managed. Both have fine hair, and bunches on their backs. This bunch is only an excrescence, a fleshy wen, which is equally tender and good to eat as the tongue of an ox. The bunches of some oxen weigh from forty to fifty pounds †, and those of others are much smaller ‡. In some, the horns are prodigiously large. In the royal cabinet, there are specimens of three feet and a half in length, and seven inches in diameter at the base. We are assured by several travellers,

* The oxen of India are of different sizes, some large, others small, and others of a middle size. But, in general, they travel well, some of them making journeys of fifteen leagues a day. Some of them are near six feet high; but these are rare. There is another kind called *dwarfs*, because they exceed not three feet in height. The latter, like the others, have a bunch on their backs, run very fast, and are used for drawing small carts. The white oxen are extremely dear. I have seen two, which belonged to the Dutch, each of which cost two hundred crowns. They were indeed very beautiful and strong; and the chariot in which they were yoked had a magnificent appearance. When the people of fashion have fine oxen, they take great care of them. The tips of their horns are ornamented with copper rings. They are covered with clothes, in the same manner as horses. They are daily curried and fed with great attention; *Relat. d'un voyage par Thevenot, tom. 3. p. 252.*

† At Madagascar, there are oxen whose bunch weighs thirty, forty, fifty, and even sixty pounds; *Voyage à Madagascar, par de V. Paris, p. 245.*

‡ The oxen have a bunch near the neck, which is larger and smaller in different individuals; *Relat. de Thevenot, tom. 2. p. 223.*

vellers, that they have seen horns which could contain fifteen and even twenty pints of water.

Throughout all Africa *, the large cattle are never castrated; and this operation is not much practised in India †. When the bulls are castrated, the testicles are not cut off, but compressed. Though the Indians keep a great number of these animals for drawing their carriages and plowing the ground, they do not rear so many as we do. As, in all warm countries, the cows give little milk, as the natives are unacquainted with butter or cheese, and, as the flesh of the calves is not so good as in Europe, the inhabitants do not greatly multiply horned cattle. Besides, in all the southern provinces of Africa and Asia, being more thinly peopled than those in Europe, there are a number of wild oxen, which are taken when young. They tame spontaneously, and submit, without resistance, to all kinds of domestic labour. They become so tractable, that they are managed with as much ease as horses: The voice of their master is sufficient to direct their course, and to make them obey. They are shod ‡, curried, caressed, and supplied

* Along the coast of Guiney, we see only bulls and cows; for the Negroes understand not the practice of castration; *Voyage de Rosman*, p. 236.

† When the Indians castrate their bulls, it is not by incision, but by the compression of ligatures, which prevents the nourishment of the parts; *Grosse's travels*, p. 253.

‡ As the roads in the province of Asmer are very stony, the oxen are shod before they set out on long journeys. They

plied abundantly with the best food. These animals, when managed in this manner, appear to be different creatures from our oxen, who only know us from our bad treatment. The goad, blows, and hunger, render them stupid, refractory, and feeble. If we had a proper knowledge of our own interest, we would treat our dependents with greater lenity. Men of inferior condition, and less civilized, seem to have a better notion than other people of the laws of equality, and of the different degrees of natural equity. The farmer's servant may be said to be the peer of his master. The horses of the Arab, and the oxen of the Hottentot, are favourite domestics, companions in exercises, assistants in every labour, and participate the habitation, the bed, and the table of their masters. Man, by this communication, is not so much degraded as these brutes are exalted and humanized. They acquire affectionateness, sensibility, and intelligence. There they perform every thing from love which they do here from fear. They do more; for, as their nature is improved by the gentleness of their education, and the perpetual attention bestowed on them, they

They are thrown on the ground by ropes fixed to their feet. When in this situation, their four feet are placed on a machine made of two cross sticks. At the same time, two thin, light pieces of iron are applied to each foot, and cover not above one half of the hoof. They are fixed by three nails, above an inch in length, which are rivetted on the opposite side; *Relat. de Thevenot, tom. 3. p. 150.*

they become capable of performing actions which approach to the human powers. The Hottentots * train their oxen to war, and employ them nearly in the same manner as the Indians employ the elephants. These oxen are instructed to guard the flocks †, which they conduct

* The Hottentots have oxen which they employ successfully in their combats. These animals are called *Backeleys*, from the word *backeley*, which, in the Hottentot language, signifies *war*. In all their armies there are considerable troops of those oxen, which are easily governed, and which are let loose by the chief, when a proper opportunity occurs. They instantly dart with great impetuosity on the enemy. They strike with their horns, kick, overturn, and trample under their feet every thing that opposes their fury. Hence, if not quickly turned back, they run ferociously into the ranks, which they soon put into the utmost disorder, and thus prepare an easy victory for their masters. The manner in which those animals are trained and disciplined, reflects much honour on the genius and ability of the Hottentots; *Voyage de Cap de Bonne-Esperance, par Kolbe, tom. 1. p. 160.*

† These backeleys are likewise of great use in guarding the flocks. When pasturing, at the smallest signal from the keeper, they bring back and collect the wandering animals. They also run with fury upon strangers, which makes them a great security against the attacks of the *buschies*, or robbers of cattle. Every *Kraal* has at least six of these backeleys, which are chosen from among the fiercest oxen. When one of them dies, or becomes unserviceable by age, another is selected from the flock to succeed him. The choice is made by one of the oldest *Kraals*, who is supposed to distinguish the animal that will be most easily instructed. This novice is associated with one of the most experienced backeleys, and he is taught to follow his companion either by blows, or by other means. In the night, they are tied together by the horns, and are likewise kept in the same situation during part of the day, till the young ox is completely trained to be a vigilant defender of the flock. These backeleys, or keepers

conduct with dexterity, and defend them from the attacks of strangers and ferocious animals. They are taught to distinguish friends from enemies, to understand signals, and to obey their master's voice. Thus the most stupid of men are the best preceptors to brutes. How does it happen, that the most enlightened man, instead of managing his fellow creatures, has so much difficulty in conducting himself?

Thus the bisons, or bunched oxen, are diffused over all the southern parts of Africa and Asia. They vary greatly in size, in colour, in the figure of the horns, &c. On the contrary, in all the northern regions of these two quarters of the world, and in the whole of Europe, including the adjacent islands, as far as the Azores, there are only oxen without bunches *, which derive their origin from

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keepers of the flocks, know every inhabitant of the *Kraal*, and show the same marks of respect for all the men, women, and children, as a dog does for those who live in his master's family. Hence, those people may approach their cattle with the utmost safety; for the backeys never do them the smallest injury. But, if a stranger, and particularly an European, should use the same freedom, without being accompanied with a Hottentot, his life would be in the greatest danger. These backeys, who pasture all around, would soon run upon him at full gallop, and, if not protected by the shepherds, by fire-arms, or by suddenly climbing a tree, his destruction is inevitable. In vain would he have recourse to sticks or stones: A backey is not to be intimidated by such feeble weapons; *Description du Cap de Bonne-esperance, par Kolbe, part. 1. chap. 20. p. 307.*

* The oxen of Tercera are the largest and finest in Europe. Their horns are very large. They are so gentle and

tame,

the aurochs. And, as the aurochs, which is our ox in a wild state, is larger and stronger than the domestic kind, the bison, or wild ox with a bunch, is likewise stronger and larger than the Indian domestic ox. He is also sometimes smaller; but the size depends solely on the quantity of food. In Malabar*, Canara, Abyffinia, and Madagafcar, where the meadows are fertile and spacious, the bisons are of a prodigious size. In Africa, and in Arabia Petrea †, where the ground is dry and sterile, the zebus or bisons are of a small size.

Oxen without bunches are spread over all America. They were successively transported thither

tame, that, from a flock consisting of more than a thousand, a single animal, upon its name being called by the proprietor, (for every individual has its peculiar name, like our dogs,) instantly runs to him; *Voyage de la Compagnie des Indes de Hollande, tom. 1. p. 490.*——See also *Le Voyage de Mandelslo, tom. 1. p. 578.*

* In the mountains of Malabar and Canara, there are wild oxen so large that they approach to the stature of the elephant; while the domestic oxen of the same country are small, meager, and short-lived; *Voyage du P. Vincent-Marie, chap. 12.*

† I saw at Mascati, a town of Arabia Petrea, another species of mountain ox, with glossy hair, as white as that of the ermine. It was so handsomely made, that it rather resembled a stag than an ox. Its legs, indeed, were shorter; but they were fine and nimble. The neck was short. The head and tail resembled those of the common ox, but were better shaped. The horns are black, hard, straight, beautiful, about three or four palms in length, and garnished with rings which seem as if they had been turned in a lathe; *Voyage du P. Vincent-Marie, chap. 12.*

ther by the Spaniards and other Europeans. These oxen have greatly multiplied, but have become smaller in these new lands. This species was absolutely unknown in South America. But, in all the northern regions, as far as Florida, Louisiana, and even in the neighbourhood of Mexico, the bisons, or bunched oxen, were found in great numbers. These bisons, which formerly inhabited the woods of Germany, of Scotland, and other northern countries, have probably passed from the Old to the New Continent. Like all the other animals, their size has diminished in America; and, according as they lived in climates more or less cold, their hair became longer or shorter. In Hudson's Bay, their beard and hair are longer and more bushy than in Mexico; and, in general, their hair is softer than the finest wool*. We cannot hesitate in pronouncing these bisons of the New Continent to be the same species with those of the Old. They have preserved all the principal characters, as the

* The wild oxen of Louisiana, instead of hair, are covered with wool as fine as silk, and all curled. It is longer in winter than in summer, and is much used by the inhabitants. On their shoulders, they have a pretty high bunch. Their horns are very fine, and are used by the hunters for carrying their powder. Between the horns, and toward the top of the head, there is a tuft of hair so thick, that a pistol bullet, though discharged ever so near, cannot penetrate it. I tried the experiment myself. The flesh of these oxen is excellent, as well as that of the cow and calf; its flavour and juice are exquisite; *Mem. sur la Louisiane, par M. Dumont, p. 75.*

the bunch on the shoulders, the long hair under the muzzle and on the anterior parts of the body, and the short legs and tail: And, upon comparing what has been said of them by Hernandez *, Fernandez †, and all the other travellers and historians of the New World ‡, with what has been delivered concerning the European bison by antient and modern naturalists ||, we will be convinced that they are not animals of different species.

Thus the wild and domestic ox of Europe, Asia, Africa, and America, the bonafus, the aurochs, the bison, and the zebu, are animals of the same species, which, according to the differences of climate, of food, and of treatment, have undergone the various changes above described. The ox is not only the most useful animal, but most generally diffused; for it has been found every where, except in South America §. Its constitution

* Hernand. hist. Mex. p. 587.

† Fernand. hist. Nov. Hisp. p. 10.

‡ Singularités de la France Antarctique, par Thevet, p. 148. —Memoire sur la Louisiane, par Dumont, p. 75.—Description de la Nouvelle France, par le P. Charlevoix, tom. 3. p. 130.—Lettres Edif. 11. recueil, p. 318. et 23. recueil, p. 238. —Voyage de Robert Lade, tom. 2. p. 315 —Dernieres decouvertes dans l'Amerique septentrionale, par M. de la Salle, p. 194. &c. &c.

|| Plin. Hist. Nat. lib. 8.—Gesner. Hist. quad. p. 128.—Aldrov. de quad. bif. p. 253.—Rzacinsky. Hist. Nat. Polon. p. 214. &c.

§ The bunched ox, or wild bison, appears to have inhabited only the northern parts of America, as Virginia, Florida,

constitution is equally adapted to the ardours of the South, and the rigours of the North. It appears to be very antient in all climates. It is domestic in civilized nations, and wild in desert countries, or among unpolished people. From its own resources, it supports itself in a state of nature, and never loses those qualities which render it serviceable to man. The young wild calves which are carried off from their mothers in India and Africa, soon become as gentle as those of the domestic race. This conformity in natural dispositions is a still farther proof of the identity of the species. Mildness of character in these animals indicates a physical flexibility in the form of their bodies; for in every species, whose dispositions are gentle, and who have been subjected to a domestic state, there are more varieties than in those who, from an inflexibility of temper, have remained savage.

If

rida, the country of the Illionois, Louisiana, &c.; for, though Hernandez calls it the *Mexican bull*, we learn from a passage of Antonio de Solis, that this animal was a stranger in Mexico, and that it was kept in the menagerie of Montezuma with other wild beasts which were brought from New Spain. ' In a second court, we saw all the wild beasts of New Spain. ' They were kept in strong wooden cages. But nothing surprised us so much as the appearance of the Mexican bull, ' which is a rare animal, and has the camel's bunch on its ' shoulders, the narrow and meager flank of the lion, a bushy ' tail and mane, and the horns and cloven foot of the bull. ' . . . This kind of amphitheatre appeared to the Spaniards worthy of a great Prince;' *Hist. de la conquête du Mexique, par Antonio de Solis, p. 519.*

If it be asked, whether the aurochs or the bison be the primitive race of oxen, a satisfactory answer may be obtained by drawing conclusions from the facts already related. The bunch of the bison, as formerly remarked, is only an accidental character, which is effaced by the commixture of the two races. The aurochs, or ox without a bunch, is, therefore, the most powerful and predominant race. Were it otherwise, the bunch, instead of disappearing, would extend, and subsist in all the individuals proceeding from a mixture of the two races. Besides, this bunch of the bison, like that of the camel, is not so much a production of nature, as an effect of labour, and a badge of slavery. In all ages, and in every country, the oxen have been obliged to carry burdens. Their backs, by constant and often excessive loads, have been deformed; and this deformity was afterwards transmitted by generation. There remained no oxen without this deformity, except in those countries where they were not employed in carrying burdens. Throughout all Africa and the East, the oxen are bunched; because, at all periods, they have carried loads on their shoulders. In Europe, where they are only employed in the draught, they have not undergone this deformed change, which is probably occasioned, in the first place, by the compression of the loads, and, in the second, by a redundance of nourishment; for it disappears when the animal is meager and ill fed.

fed. Domestic oxen with bunches might escape, or be abandoned in the woods, where their posterity would inherit the same deformity, which, instead of disappearing, would augment by the abundance of food peculiar to all uncultivated countries; so that this secondary race would spread over all the desert lands of the North and South, and pass, like the other animals which can support the rigours of cold, into the New Continent. The identity of the species of the bison and aurochs is still farther confirmed from this circumstance, that the bisons of North America have so strong an odour of musk, that they have been called *musk oxen* by most travellers *; and, at the same time, we learn, from the testimony of spectators †, that the aurochs, or wild

OX

* Fifteen leagues from the river Danovise, is the river called *Sea-wolf*, both in the neighbourhood of Hudson's bay. In this country, there is a species of ox called the *Musk ox*, from his strong odour of musk, which, in certain seasons, renders his flesh uneatable. These animals have very fine wool, which is longer than that of the Barbary sheep. I had some of it sent me to France in the year 1708, of which I made stockings, which were as fine as those of silk. . . . These oxen, though smaller than ours, have larger and longer horns. Their roots join on the top of the head, and descend on the side of the eyes as low as the throat; then the tips mount up in the form of a crescent. I have seen two of them which weighed together sixty pounds. Their legs are so short, that the wool always trails on the ground where they walk, which renders them so unshapely, that it is difficult, at a distance, to know at which end the head is placed; *Hist. de la Nouvelle France, par le P. Charlevoix, tom. 3. p. 132.*—See also *Le Voyage de Robert Lade, tom. 2. p. 315.*

† Ephem, German. decad, 2. ann. 2. observ. 7.

ox of Prussia and Livonia, has the same scent of musk.

Of all the names, therefore, prefixed to this article, which, both by antient and modern naturalists, are represented as so many distinct species, there remain only the buffalo and the ox. These two animals, though very similar, both domestic, often living under the same roof, and fed in the same pastures, though at liberty to intermix, and frequently stimulated to it by their keepers, have uniformly refused to unite. They neither copulate nor produce together. Their natures are more remote from each other than that of the ass and horse: They even seem to have a mutual antipathy; for we are assured, that cows will not suckle young buffaloes, and that female buffaloes refuse to suckle calves. The disposition of the buffalo is more obstinate and untractable than that of the ox. He is less obedient, more violent, and subject to humours more frequent and more impetuous. All his habits are gross and brutal. Next to the hog, he is the dirtiest of domestic animals; for nothing is more difficult than to dress and keep him clean. His figure is gross and forbidding. His aspect is wild and stupid. He stretches out his neck in an aukward, ignoble manner, and carries his head so ungracefully, that it generally hangs down toward the ground. He bellows hideously, and with a stronger and deeper tone than that of the bull. He has meager limbs, a naked tail,

tail, a dark countenance, and a skin as black as his hair. He differs chiefly from the ox by this black colour of his skin: It appears under the hair, which is not close. His body is thicker and shorter than that of the ox, his legs longer, his head proportionally smaller, his horns less round, being black and compressed; and he has a tuft of curled hair on his front. His skin is also thicker and harder than that of the ox. His flesh is black and hard, and has not only a bad taste, but a most disagreeable odour*. The milk of the female buffalo is not so good as that of the cow; but she yields a much greater quantity of it †. In warm countries, most cheeses are made of the buffalo's milk. The flesh of young buffaloes, though fed with milk, is not good. The skin is of more value than the rest of

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* In travelling from Rome to Naples, we are sometimes regaled with crows and buffaloes, and are happy to find them. The flesh of the buffalo is black, hard, and stinking, and none but poor people and the Jews of Rome are in the habit of eating it; *Voyage de Missin, tom. 3. p. 54.*

† In entering Persia, by the way of Armenia, the first place worthy of notice is called the *Three Churches*, at the distance of three leagues from Erivan. In this country, there are vast numbers of buffaloes, which serve the inhabitants for ploughing their lands. The females yield a great quantity of milk, of which butter and cheese are made. Some females give daily twenty-two pints of milk; *Voyage de Tavernier, liv. 1. tom. 1. p. 41.*—The female buffaloes go with young twelve months, and often give twenty-two pints of milk a-day, of which so great quantities of butter are made, that, in some of the villages on the Tigris, we saw from twenty to twenty-five barks loaded with butter, to be sold along both sides of the Persian Gulf; *Id. ib.*

the animal, the tongue of which is alone good for eating. The skin is solid, pretty flexible, and almost impenetrable. As these animals are larger and stronger than oxen, they are employed with advantage in different kinds of labour. They are made to draw, and not to carry burdens. They are directed and restrained by means of a ring passed through their nose. Two buffaloes yoked, or rather chained, to a chariot, draw as much as four strong horses. As they carry their neck and head low, the whole weight of their body is employed in drawing; and their mass much surpasses that of a labouring horse.

The height and thickness of the buffalo are sufficient indications that he originated from warm climates. The largest quadrupeds are produced in the Torrid Zone of the Old Continent; and the buffalo, in the order of magnitude, should be ranked next to the elephant, the rhinoceros, and the hippopotamus. The camelpard and the camel are taller, but thinner; and the whole are equally natives of the southern regions of Asia and Africa. Buffaloes, however, live and produce in Italy, in France, and in other temperate countries. Those kept in the royal menagerie have produced twice or thrice. The female brings forth but one at a birth, and goes with young about twelve months; which is a still farther proof of the difference of this species from that of the cow, whose time of gestation is only nine months. It appears, likewise,

wife, that these animals are more gentle and less brutal in their native country; and that, the warmer the country, their disposition is more docile. In Egypt *, they are more tractable than in Italy, and in India † than in Egypt. The Italian buffaloes have also more hair than those of Egypt, and the Egyptian than those of India ‡. Their fur is by no means close; because

* The buffaloes are numerous in Egypt. Their flesh is good; and they are not so ferocious as those of Europe. Their milk is of great use, and produces excellent butter; *Descript. l'Egypte, par Mairlet, p. 27.*

† In the kingdom of Aunan and Tonquin, the buffaloes are very tall, and have high shoulders. They are also robust, and such excellent labourers, that one alone is sufficient to draw a plough, though the coulter enters very deep into the ground. Their flesh is not disagreeable; but that of the ox is better, and more commonly used; *Hist. de Tonquin, par le P. de Rhodes, p. 51.*

‡ At Malabar, the buffalo is larger than the ox. He is shaped nearly in the same manner. His head is longer and flatter. His eyes are larger, and almost entirely white. His horns are flat, and often two feet long. His legs are thick and short. He is ugly, and almost without hair. He walks slowly, and carries heavy burdens. Like the cows, they go in flocks; and their milk produces butter and cheese. Their flesh is good, though less delicate than that of the ox. They are excellent swimmers, and traverse the most rapid rivers. We have seen them tamed. But the wild buffaloes are extremely dangerous; for they tear men to pieces, or crush them with a single stroke of their heads. They are less to be feared in the woods than in any other situation; for their horns often entangle among the branches, which gives those time to fly who are pursued. The skin of these animals is used for a number of purposes; and even pitchers are made of it to keep water and other liquors. Those on the Malabar coast are almost all wild; and strangers are not prohibited from hunting and eating them; *Voyage de Dellon, p. 110.*

because they belong to warm climates; and the large animals, in general, of these countries, have little or no hair.

In Africa and India, there are vast quantities of wild buffaloes, which frequent the banks of rivers and extensive meadows. These wild buffaloes go in flocks *, and make great havock in the cultivated fields. But they never attack men, unless when they are wounded. They are then extremely dangerous †; for they run straight upon the enemy, overturn him, and trample him under their feet. They are, however, afraid at the sight of fire ‡, and they abhor

* There are such numbers of wild buffaloes in the Philippine isles, that a good hunter, with a horse and a spear, may kill thirty of them in a day. The Spaniards kill the buffalo for his skin, and the Indians for his flesh; *Voyage de Gemelli Careri, tom. 5. p. 162.*

† We are told by the Negroes, that, when they shoot at the buffaloes, without wounding them mortally, they dart with fury on the hunters, and trample them to death. . . . The Negroes watch where the buffaloes assemble in the evening, climb a large tree, from which they fire upon them, and descend not till the animals are dead; *Voyage de Bofnan, p. 437.*

‡ At the Cape of Good Hope, the buffaloes are larger than those of Europe. Instead of being black, like the latter, they are of a dark red colour. Upon the front, there is a rude tuft of curled hair. Their whole body is well proportioned; and they advance their head very much forward. Their horns are very short, and hang down on the side of their neck; the tips bend inward, and nearly join. Their skin is so hard and firm, that it is difficult to kill them without a good firelock. Their flesh is neither so fat nor so tender as that of ordinary oxen. The buffalo, at the Cape, turns furious at the sight of a red garment, or upon hearing a gun discharged

hor a red colour. We are assured by Aldrovandus, and several other naturalists and travellers, that no person dare clothe himself in red, in countries frequented by the buffalo. I know not whether this aversion to fire and a red colour be general among the buffaloes; for it is only some of our oxen which are enraged at the sight of red clothes.

The buffalo, like all the large animals of warm climates, is fond of wallowing, and even of remaining in the water. He swims well, and boldly crosses the most rapid rivers. As his legs are longer than those of the ox, he runs more swiftly. The Negroes of Guiney, and the Indians of Malabar, where the buffaloes are very numerous, are fond of hunting them. They never attack these animals openly, but watch for them on the tops of trees, or lie hid in the thickets through which the buffaloes cannot pass on account of their horns. These people esteem the flesh of the buffalo, and draw great profits from his skin and horns, which are harder and better than those of the ox.

The animal called *empacassa* or *pacassa* at Congo, though very imperfectly described by travellers,

discharged near him. On these occasions, he cries in a hideous manner, strikes with his feet, turns up the earth, and runs with fury against the man who has shot, or wears a red garment. Neither fire nor water can stop his course. Nothing but a high wall, or some similar obstacle, is capable of restraining him; *Descript. de Bonne-esperance, par Kolbe, tom. 3. chap. 11. p. 25.*

lers, appears to me to be the buffalo; and the animal mentioned under the name of *empabunga* or *impalunca*, in the same country, is, perhaps, the bubalus, whose history shall be given along with that of the gazelles or antelopes.

S U P P L E M E N T.

The ox and bison are two distinct races of the same species. Though the bison uniformly differs from the ox by the bunch on his back, and the length of his hair, he succeeds very well in the Isle of France: His flesh is much better than that of the European oxen; and, after some generations, his bunch vanishes entirely. His hair is smoother, his limbs are more slender, and his horns longer than those of the common ox. I saw, says M. de Querhoënt, bisons brought from Madagascar, which were of an astonishing size*.

The bison, of which we here give a figure, and which we saw alive, was taken, when young, in the forests of the temperate parts of North America. It was brought to Holland, and purchased by a Swede, who transported it from town to town in a large cage, where it was firmly

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* Note communicated by M. le Vicomte de Querhoënt.

ly fixed by the head with four ropes. The enormous mane which furrounds its head is not hair, but a flowing wool, divided into locks, like an old fleece. This wool is very fine, as well as that which covers the bunch, and the anterior part of the body. The parts which appear naked in the engraving, are only so at a certain time of the year, which is rather in summer than in winter; for, in the month of January, all parts of the body were almost equally covered with a fine, close, frizzled wool, under which the skin was of a footy colour; but, on the bunch, and all the other parts which are covered with longer wool, the skin is tawny. This bunch, which consists entirely of flesh, varies according to the plight of the animal. To us he appeared to differ from the European only by the bunch and the wool. Though under much restraint, he was not ferocious, but allowed his keepers to touch and caress him.

It would appear, that there were formerly bison in the north of Europe. Gesner even asserts, that, in his time, they existed in Scotland. Having inquired into this fact, I was informed, by letters both from Scotland and England, that no remembrance or vestige of them could be traced in that country. Mr Bell, in his travels from Russia to China, mentions two species of oxen which he saw in the northern parts of Asia; one of which was the aurochs, or wild ox, and is the

the same race with our oxen; and the other, which we have denominated, after Gmelin, the *Tartarian*, or *Grunting Cow*, appeared to be the same species with the bison. After comparing this grunting cow with the bison, I found an exact coincidence in all the characters, except the grunting instead of bellowing. But I apprehend, that this grunting is not constant and general, but contingent and particular, similar to the deep interrupted voice of our bulls, which is never fully exhibited but in the season of love. Besides, I was informed, that the voice of the bison, whose figure I have represented, was never heard, and that, though considerably hurt, it did not complain, which induced its master to think that it was mute: And it is probable, that its voice would be developed by grunting or interrupted sounds, when, in full possession of freedom and in presence of a female, the animal's spirits were excited by love.

It is singular, that the bisons, or bunched oxen, whose race appears to be extended, in the Old Continent, from Madagascar and the point of Africa, and from the extremity of the East Indies as far as Siberia, and that, in the new Continent, though they are found from the country of the Ilionois to Louisiana, and even Mexico, they should never have passed the Isthmus of Panama; for there are no bisons in any part of South America, though the climate is perfectly agreeable

agreeable to their nature, and the European oxen have multiplied there as well as in any other part of the globe.

At Madagascar, the best kind of bulls and cows were brought thither from Africa, and have a bunch on their backs. The cows yield so little milk, that a single Dutch cow would give six times as much. In this island, there are wild bisons which wander in the forests. The flesh of these bisons is not equal to that of our oxen *. In the southern parts of Asia, we likewise find wild oxen. The natives of Agra hunt these animals on the mountain of Nerwer, which is surrounded with wood. This mountain is situated on the road from Surat to Golconda. These wild cattle are generally beautiful, and sell very dear †.

The zebu seems to be a miniature of the bison, whose race, as well as that of the ox, has undergone great variations, especially in size. The zebu, though an original native of very warm regions, is capable of existing and multiplying in temperate climates. 'I saw,' says Mr Colinson, 'a great number of these animals in the Duke of Richmond's, and also in the Duke of Portland's parks, where they every year bring forth calves, which are extremely beautiful. The fathers and mothers were brought

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* Voyage de François le Guat, tom. 2. p. 71.

† Voyage de Thevenot, tom. 3. p. 113.

‘ from the East Indies. The bunch on the
 ‘ shoulder is twice as large in the male as in the
 ‘ female, whose stature exceeds that of the male.
 ‘ The young zebu sucks its mother like other
 ‘ calves; but, in our climate, the milk of the
 ‘ mother soon dries up, and the suckling of the
 ‘ young is completed by the milk of another
 ‘ female. The Duke of Richmond ordered one
 ‘ of these animals to be slain; but its flesh was
 ‘ not so good as that of the ox *.’

Among the oxen without bunches, there are also small individuals, which, like the zebu, may constitute a particular race. Gemelli Careri, in his journey from Ispahan to Schiras, saw two small cows, which the Bashaw of the province had sent to the King, and which exceeded not the size of calves. Though fed solely on straw, they were very fat †. In general, it appears, that the zebus, or small bisons, as well as our little oxen, are more fleshy and fatter than the bisons and oxen of the common size.

With regard to the buffaloes, we have little to add: It shall only be remarked, that, though they cannot use their horns, they are made to fight lions and tigers in the Mogul's country. These animals are very numerous in all warm climates, especially in marshy countries, and in
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* Letter from the late Mr Colinson to M. de Buffon, dated at London, December 30. 1764.

† Voyage de Gemelli Careri, tom. 2, p. 338.

the neighbourhood of rivers. Water, and a moist soil, seem to be still more necessary to them than the warmth of the climate *. It is for this reason that none of them are found in Arabia, where almost the whole country is dry. The wild buffaloes are hunted, but with much caution; for they are exceedingly dangerous, and, when wounded, run against men with great fury. As to the domestic buffaloes, Niebuhr remarks, that, in some places, as at Basra, it is the practice, when milking the female, to thrust the hand, as far as the elbow, into the vagina, because this operation makes her yield a greater quantity of milk †. This fact appears not to be probable; but the female buffalo, like some of our cows, may forcibly retain her milk; and this gentle kind of titillation may relax the contraction of her teats.

At the Cape of Good Hope, the body of the buffalo is of the same size with our ox; but he has shorter legs, and a larger head. He is a very formidable animal. He frequents the borders of the woods, and, as his sight is not good, he remains there with his head placed near the ground, in order the better to distinguish objects among the roots of the trees. When he perceives

* I formerly remarked, that the buffaloes might succeed in France. Attempts have lately been made to propagate them in Brandenbourg, near Berlin; *Gazette de France*, June 9. 1775.

† Descript. de l'Arabie, par M. Niebuhr, p. 145.

ceives any disagreeable object near him, he darts suddenly upon it, making, at the same time, a most hideous bellowing; and it is very difficult, on these occasions, to escape his fury. He is not so much to be dreaded in the open fields. His hair is red, and black in some places. They appear often in numerous flocks *

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* Note communicated by the Vicomte de Querhoënt to M. de Buffon.



A. Bell's sculp.

BUFFALO.



W. H. St. John del.

BISON.

The M U F F L O N *, and other S H E E P.

THE weakest species of useful animals were first reduced to a domestic state. The sheep and goat were subjugated before the horse, the

* The Siberian goat has large horns bending back, close at their base, distant at their points, with circular rugae. These animals vary in size and colour. The skin of the one the British Museum did me the favour of accepting, was covered with pale ferruginous hair, on the sides short, on the top of the neck longer, and a little erect. Along the lower side of the neck, and on the shoulders, the hair was fourteen inches long. Beneath the hair was a short wool. On the knees, there was a bare spot, as if by kneeling to lie down. The tail was very short; and the horns were twenty-five inches long, eleven in girth in the thickest place, and one foot seven inches distant from point to point.—The horns of the females are much less than those of the males; *Pennant's Synops. of quad. p. 18.*

Moufflon is derived from the Italian word *Mufione*, the name of this animal in the islands of Corsica and Sardinia; in Greek, *μουμμων*, according to Strabo; in Latin *Musmon* or *Musimon*; in Siberia, *Stepnie-barani*, that is, *wild sheep*, according to Gmelin; and, among the Mogul Tartars, *Argali*.

Musmon; *Plin. lib. 8. c. 49.* *Ophion*; *Id. lib. 28. c. 9. lib. 30. c. 15.*

Tragelaphus; *Belon, Obs. p. 54. Raii Synops. quad. p. 82. Klein, quad. p. 20.* The coat of the tragelaphus, says Belon, is similar to that of the he-goat; but he has no beard. His horns, which do not shed, resemble those of a she goat; but they are sometimes twisted like those of a ram. He has the muzzle, front, and ears of a sheep; and his scrotum is likewise pendu-

the ox, or the camel. They were likewise more easily transported from one climate to another. From this source, all the varieties among these species, as well as the difficulty of distinguishing the genuine stock of each, have proceeded. We formerly proved, that our domestic sheep, in their present condition, could not subsist without the support of man *; from which it is apparent, that Nature never produced them as they exist at present, but that they have degenerated under our care. We must, therefore, search among the wild animals for those which make the nearest approach to them. We must compare them with the domestic sheep of foreign countries, examine the different causes which might

pendulous and large. His thighs, under the tail, are white, and the tail is black. Upon the breast and throat the hair is so long that he seems to have a beard. The hairs upon the shoulders and breast are long and black. He has two gray spots, one on each side of the flanks. His nostrils are black; and his muzzle, as well as the under part of his belly, are white.—*Note.* This description of the tragelaphus by Belon agrees, in every essential character, with that we have given of the mufflon.

Mufmon, feu musimon; *Gesner, Hist. quad. p. 823.*

Hircus cornibus supra rotundatis, infra planis, semicirculorum referentibus. . . . Le chamois de Siberie; le chevre du Levant; *Briffon, quad. p. 46.*

Rupicapra cornibus arietinis, Argali; *Nov. Com. Petrop. tom. 4. p. 49. 388. tab. 8.*

Fishtall, Lerwee; *Shaw's travels, p. 243.*

Capra Ammon, cornibus arcuatis, semicircularibus, subtus planiusculis, palearibus laxis, pilosis, gula imberbi; *Linn. Syst. Nat. p. 97.*

* See above, article *Sheep*, vol. III.

might introduce changes into the species, or make it degenerate, and endeavour, as in the case of the ox, to recall all these varieties, and all these pretended species, to one primitive race.

Our sheep, in its present state, exists no where but in Europe, and some of the temperate provinces of Asia. When transported into warm countries, as Guiney *, it loses its wool, and is covered with hair: Its fertility is diminished, and the taste of its flesh is altered. In very cold countries, it cannot subsist. But, in these cold climates, and particularly in Iceland, we find a race of sheep with several horns, a short tail, and hard thick wool, under which, as in most northern

* *Ovis Africana pro vellere lanoso pilis brevibus hirtis vestita; hoc genus vidimus in vivario regio Weit, monasteriensi S. Jacobi dicto; quoad formam corporis externam ovibus vulgaribus persimile, verum pro lana ei pilus fuit. . . . Specie a nostratibus differre non fidenter affirmaverim; fortasse quemadmodum homines in Nigritarum regionibus pro capillis lanam quandam obtinent, ita vice versa pecudes hae pro lana pilos; Ray, Syn. quad. p. 75.——In the kingdom of Congo, in Loango and Cabinda, the sheep, instead of soft wool, are covered with coarse hair, similar to that of dogs. The extreme heat of the air, which dries up all the oily humours, is the cause of this coarseness. I made the same observation with regard to the Indian sheep; Voyage de J. Ovington, tom. 1. p. 60.——The sheep are pretty numerous along the coast of Guiney, and yet they are very dear. They have the same figure with those of Europe, except that they are one half smaller, and, instead of wool, are covered with hair of an inch long. . . . The flesh has not the smallest appearance of that of the European sheep, being extremely dry, &c.; Voyage de Bosman, p. 237.*

thern animals, there is a layer of softer, finer, and more bushy wool. In warm countries, on the contrary, the sheep have generally short horns and a long tail, some of which are covered with wool, others with hair, and others with a mixture of wool and hair. The first of these warm country sheep, which is commonly called the *Barbary sheep* *, or the *Arabian sheep* †, resembles the domestic kind in every respect, except the tail ‡, which is so loaded with fat, that

* Persia abounds in sheep and goats. Some of these sheep, which are called *Barbary*, or *broad tailed sheep*, have a tail that weighs above 30 pounds. It is a heavy burden to the poor animals, and still more so, as it is narrow at the origin, and broad at the extremity. Some of them are so heavy, that the animals are unable to trail them; and the shepherds are obliged to fix boards with two wheels under the tail, to preserve it from galling, &c.; *Chardin, tom. 2. p. 28.*

† *Ovis laticauda Arabica*; *Raii Synops. quad. p. 74.* Most naturalists call this animal the *Arabian sheep*. It is not, however, an original native of Arabia, nor does it belong to the Arabian race of sheep. But they are very numerous in South Tartary, Persia, Egypt, Barbary, and in all the eastern coasts of Africa.

Aries laniger, cauda latissima. . . . Ovis laticauda. La brebis à large queue; *Briffon, quad p. 50. Linn. Syst. Nat. p. 97. Nov. Com. Petrop. tom. 5. p. 347. tab. 8.*

‡ Neque his arietibus ullum ab aliis discrimen praeterquam in cauda quam latissimam circumferunt. . . . Nonnullis libras decem aut viginti cauda pendet, cum sua sponte impinguntur; verum in Ægypto plurimi farciendis vervecibus intenti, fursure hordeoque faginant; quibus adeo crassescit cauda ut seipfos dinovere non possint; verum qui eorum curam gerunt caudam exiguis vehiculis alligantes gradum promovere faciunt; vidi hujusmodi caudam libras octuaginta ponderare; *Leon. Afric. Descript. Afric. vol. 2. pag. 253.*

that it is often more than a foot broad, and weighs above twenty pounds. Besides, there is nothing remarkable in this animal but its tail, which it carries as if a cushion were fixed to its thighs. Among this race of sheep, there are some whose tails are so long * and heavy, that they are obliged to be supported with a small wheel machine, to enable the animals to walk. In the Levant, this sheep is covered with very fine wool; but, in warm countries, as Madagascar and the Indies †, it is covered with hair. The redundance of fat, which, in our sheep, fixes about the kidneys, descends, in these animals, upon the vertebrae of the tail: The other parts of their bodies are less loaded with fat than our fed wedders. This variety should be attributed to the food, the climate, and the care of men; for those broad or long tailed sheep are domestic like ours, and even require more care and management. This race is much more diffused than that of the ordinary kind. It is common

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in

* *Ovis Arabica altera*; *Raii. synops. quad. p. 74.* *Aries laniger cauda longissima.*—*Ovis longicauda*; *Briffon. quad. p. 76.* *Note.* Ray and Briffon have made two distinct species of these broad and long tailed sheep. But Linnaeus has properly reduced them to one.

† The island of Madagascar produces sheep with tails so large that they weigh twenty pounds. They are loaded with fat, which does not melt, and are very delicate to eat. The wool of these sheep is like goats hair; *Voyage de Placourt, p. 3.*—The flesh of the wedders and young females has an excellent flavour; *Idem, p. 151.*

in Tartary *, Persia †, Syria ‡, Egypt, Barbary, Æthiopia §, Mofambique ||, Madagafcar **, and the Cape of Good Hope ††.

In

* The sheep of Tartary, like those of Persia, have large tails, which consist entirely of fat, and weigh from twenty to thirty pounds. Their ears are pendulous, and their nose flat; *Voyage d'Olearius, tom. 1. p. 321.*—The sheep of East Tartary have tails which weigh from ten to twelve pounds. These tails consist of solid fat, which has an excellent relish. The bones of the vertebrae are not larger than those of our sheep; *Relation de la Grande Tartarie, p. 187.*—The sheep of Calmuc Tartary have their tails concealed in a cushion of many pounds weight; *Id. p. 267.*

† A single tail of some of the Persian sheep weighs from ten to twelve pounds, and yields five or six pounds of fat. Its figure is the reverse of that of our sheep, being broad at the extremity, and small at the origin; *Voyage de Tavernier, tom. 2. p. 379.*

‡ In Syria, Judea, and Egypt, the tails of the sheep are so large, that I have seen one of them weigh above thirty-three pounds, though the animals were not larger than the sheep of Berri, but much handsomer, and bearing finer wool; *Voyage de Villamont, p. 629.*

§ In Æthiopia, there are sheep whose tails weigh more than twenty-five pounds.—Others have tails a fathom long, and twisted like a vine branch; *Drake's voyage, p. 85.*

|| Sunt ibi oves quae una quarta parte abundant; integram enim ovem si quadrifidè secaveris praecise quinque partibus plenarie constabit; cauda siquidem quam habent tam lata, crassa et pinguis est, ut ob molem reliquis par sit; *Hug. Linscot. navig. part. 2. p. 19.*

** The island of Madagafcar abounds in cattle.—The tails of the rams and ewes are so large, that we saw one which weighed twenty-eight pounds; *Voyage de Pyrard, tom. 1. p. 37.*

†† In the sheep at the Cape of Good Hope there is nothing remarkable, excepting the length and thickness of the tail, which

In the islands of the Archipelago, and particularly in Crete, there is a race of domestic sheep, of which Belon has given a figure and description under the name of *strepficheros* *. This sheep is of the same size with the common kind. Like the latter, it is covered with wool, and differs from them only by having erect horns chamfered in the form of a screw.

In fine, we find, in the warmer countries of Africa and India, a race of large sheep with coarse hair, short horns, pendulous ears, and a kind of dewlap which hangs under the neck. This sheep is called by Leo Africanus and Marmol, *adimain* †; and it is known to the naturalists under the name of the *Senegal sheep* ‡, the

which commonly weighs from fifteen to twenty pounds. The Persian sheep, though smaller, have still larger tails. I have seen some of this race at the Cape, whose tails weighed at least thirty pounds; *Descript. du Cap de Bonne-Esperance, par Kelte, tom. 2. p. 97.*

* In Crete, and particularly on Mount Ida, there is a race of sheep, which go in large flocks, and are called *strophocheri*. They resemble the common kind in every thing but their horns, which, instead of being twisted, are straight and chamfered like a screw; *Observ. de Belon. p. 15.*

† *Adimain*, animal domesticum arietem forma refert. — Aures habet oblongas et pendulas. Libyci his animalibus pecoris vice utuntur. — Ego quondam juvenili fervore ductus horum animalium dorso insidens ad quartam miliarium partem delatus fui; *Leon. Afric. Descript. Afric. vol. 2. p. 752.* See also *l'Afrique de Marmol, tom. 1. p. 59.*

‡ The wedders, or rather the rams of Senegal, for none of them are castrated, are a distinct and strongly marked species. They have nothing of the common kind but the head and tail.

the *Guiney sheep* *, the *sheep of Angola*, &c. It is domestic, like the other kind, and subject to the same varieties. We have given figures of two of these sheep, which, though they differ in particular characters, have so many resemblances,

tail. From the coarseness of their hair, they seem to be allied to the goat.—It appears that wool would be incommo-
dious to the sheep in very warm climates; and that Nature has changed it into hair of a moderate length, and pretty thin; *Voyage au Senegal, par M. Adanson, p. 36.*

African sheep.—It is meagre, very long legged, and tall, with short horns and pendant ears. It is covered with short hair, instead of wool, and has wattles on its neck. Perhaps it is the *adimain* of Leo Africanus, p. 341. which he says furnishes the Lybians with milk and cheese. It is of the size of an ass, and shaped like a ram; *Pennant's synopsis of quadr. p. 12.*

* *Aries Guineensis*, five *Angolenfis*; *Marcgrav. p. 234. Raii synopsis quadr. p. 75.*

Aries pilosus, pilis brevibus vestitus, juba longissima, auriculis longis pendulis.—*Ovis Guineensis*. La brebis de Guinée; *Briffon, Regn. anim. p. 77.*

Ovis Guineensis, auribus pendulis, palearibus laxis, pilosis, occipite prominente; *Linn. syst. nat. p. 98.*

Sheep of Sahara; *Shaw's travels, p. 241.*

Carnero, or Bell wedder; *Dalla Valle, trav. p. 91.*

The Guiney sheep differ from the European kind. They are generally longer legged, and have no wool, but short, soft hair, like that of a dog. The rams have long manes, which sometimes hang down to the ground, and cover their necks from the shoulders to their ears, which are pendulous. Their horns are knobbed, pretty short, sharp, and bended forward. These animals are fat; their flesh is good, and well flavoured, especially when they feed on the mountains or along the sea coasts; but it smells of tallow when they pasture on marshy grounds. The ewes are exceedingly prolific.—They always bring forth two lambs at a time; *Voyage de Desmarchais, tom. 1. p. 141.*

semblances, that we must pronounce them to belong to the same race. Of all the domestic kinds, this race appears to approach nearest to a state of nature. It is larger, stronger, nimbler, and, consequently, more capable of subsisting as a wild animal. But, as it is only found in very warm climates, and cannot endure cold, and as, even in its native climate, it subsists not in a wild state, but is domestic, and requires the aid of man, it cannot be regarded as the primitive stock from which all other sheep have derived their origin.

In considering domestic sheep, therefore, relative to the order of climate, we have, 1. The northern sheep with several horns, and whose wool is extremely coarse. The sheep of Iceland, Gothland, Muscovy *, and other parts of the north of Europe, have all coarse hair, and seem to belong to the same race.

2. Our sheep, whose wool is very fine and beautiful in the mild climates of Spain and Persia, but which, in very warm countries, turns coarse. We have already remarked the conformity between the influence of the climates of Spain and of Chorazan, a province of Persia,
upon

* Twenty Silesian shepherds arrived at Petersburg, and were afterwards sent to Cazan to shear the sheep, and to teach the Muscovites the mode of preparing wool.— But this did not succeed; and the chief cause of its failure was said to be owing to the coarseness of the wool, the sheep and goats having always intermixed and produced together; *Nouv. Mem. sur l'état de la Moscovie, tom 1. p. 290.*

upon the hair of goats, cats, and rabbits: It acts in the same manner upon the wool of sheep, which is very fine in Spain, and still finer in that part of Persia*.

3. The large tailed sheep, whose wool is very fine in temperate countries, such as Persia, Syria, and Egypt; but, in warmer climates, it is converted into hair more or less coarse.

4. The

* At Mefchet in the country of Chorazan, on the frontiers of Persia, lamb skins formerly constituted a great article of commerce. The fleeces were of a beautiful silver gray colour, all curled, and finer than silk: Those sheep which come from the mountains to the south of this city, and from the province of Kerman, afford the finest wool in Persia; *Relation de la Grande Tartarie*, p. 187.—The greatest part of this fine wool is furnished by the province of Kerman, which is the antient Caramania; and the best kind comes from the mountains adjacent to the town, which has the same name with the province. It is singular, that, when the sheep of these places have eat the new herbage from January to May, the fleeces fall entirely off, and leave the animal as bare as scalded pigs; so that there is no occasion for shearing them as in France. When the fleeces are collected, they are beat or threshed; by which operation the coarser part separates, and leaves nothing but the fine.—This wool is never dyed: It is naturally of a bright brown or a gray ash-colour, and very little of it is white; *Voyage de Tavernier*, tom. 1. p. 130.—The wedders of the Usbeck and Beschac Tartars have long, grayish wool, curled at the ends into small white rings, which have the appearance of pearls. These fleeces are more esteemed than the flesh; because, next to the sable, they are the most valuable furs which are used in Persia. The animals are fed with great care, and generally in the shade. When obliged to be exposed to the open air, they are covered like our horses. The tail of these wedders is small like that of the common kind; *Voyage d'Olearius*, tom. 1. p. 547.

4. The *Strepsicheros* or Cretan sheep. They resemble ours in every article but the horns, which are erect and chamfered in a spiral form.

5. The *adimain*, or large sheep of Senegal and India, which are covered with hair more or less short and coarse, in proportion to the heat of the climate. All these sheep are only varieties of the same species, and would unquestionably produce with each other; since we know from experience that the he-goat, whose species is more remote, produces with our ewes. But, though these five or six races of domestic sheep are all varieties of the same species, entirely occasioned by difference of climate, food, and management; yet none of them appears to be the primitive stock or source of all the rest. None of them is sufficiently strong or nimble to resist the carnivorous animals, or to escape from them by flight. All of them equally require care and protection. Hence the whole should be regarded as degenerated races, formed by the hand of man, and multiplied for his use. While he nourished, cultivated, and increased these domestic races, he would neglect, injure, and destroy the wild race, which, being strong and less tractable, would, of course, be more incommodious and less useful to him. The individuals of this race; therefore, would be small, and limited to such desert or thinly inhabited places as could afford them subsistence. Now, in the mountains of Greece, in the island of Cyprus, Sardinia, and Corfica, and in the deserts of Tartary, we find
the

the animal called *moufflon*, which seems to be the primitive stock of all the different varieties of sheep. It lives in a state of nature, and subsists and multiplies without the aid of man. It resembles, more than any other wild animal, all the domestic kinds, and it is stronger, swifter, and more vivacious than any of them. It has the head, front, eyes, and face of the ram. It likewise resembles him in the figure of the horns, and in the whole habit of the body. In fine, it produces with the domestic sheep *, which alone is sufficient to prove that it belongs to the same species, and is the primitive stock from which all the other varieties have originated. The only difference between the moufflon and our sheep is, that the former is covered with hair instead of wool. Now, we have already seen, that, in domestic sheep, wool is not an essential character, but only a production of temperate climates; since, in warm countries, these same sheep lose their wool, and are covered with hair; and, in very cold regions, their wool is as coarse as hair. Hence it is by no means surprising, that the primitive wild sheep, which must have been exposed to heat and cold, and

must

* Est et in Hispania, sed maxime Corsica, non maxime ab- simile pecori (scilicet ovili) genus musmonum, caprino villo, quam pecoris vellere propius: Quorum e genere et ovibus natos prisca umbros vocarunt; *Plin. Hist. nat. lib. 8. cap. 49.* From this passage we learn, that the moufflon has at all times produced with the sheep. The antients called all the mongrel animals of this race, *umbri*, *imbri*, or *ibri*.

must have multiplied without shelter in the woods and deserts, should not be covered with wool, which it would soon lose among the thickets, and its nature would be changed by the continual action of the air and intemperance of the seasons. Besides, when the he-goat copulates with the domestic ewe; the produce is a kind of mouflon; for the lamb is covered with hair, and is not an unfertile mule, but a mongrel, which rises up toward the primitive species, and seems to indicate that the goat and our domestic sheep have something common in their origin: And, as we know from experience, that the he-goat easily produces with the ewe, but that the ram is incapable of impregnating the she-goat, it is evident, that, among these animals, while in a domestic state, the goat is the predominant species. Thus our sheep is a species much more degenerated than that of the goat; and it is extremely probable, that, if the she-goat were served with a mouflon, instead of a domestic ram, she would produce kids which would approach to the species of the goat, as the lambs produced by the he-goat and ewe rise toward the original species of the ram.

I am aware of objections to this doctrine from those systematic naturalists, who found all their knowledge of natural history upon some particular characters; and, therefore, shall endeavour to prevent them. The first character, they will say, of the ram, is to carry wool, and the first character of

the goat is to be covered with hair. The second character of the ram is to have horns bended in a circular form, and turned backward, and that of the he-goat is to have them straight and erect. These, they will affirm, are the essential and infallible marks by which sheep and goats will always be distinguished; for they must acknowledge, that every other article is common to both. None of them have cutting teeth in the upper jaw; but each of them has eight in the under jaw. In both, the canine teeth are wanting; their hoofs are equally divided, and their horns are simple and permanent. Both have their paps situated in the region of the belly; and both feed upon herbage. Their internal structure is still more similar; for it appears to be the very same. The number and form of their stomachs, the structure and disposition of their intestines, the substance of the flesh, the qualities of the fat and seminal liquor, the times of gestation and growth, and the duration of their lives, are exactly the same. There remain, therefore, only the wool and the horns by which these two species can be distinguished. But, it has already been shown, from facts, that wool is not so much a natural substance, as a production of climate, aided by the care of man. The sheep of warm and of cold countries, and wild sheep, have no wool. Besides, in very mild climates, the goats may be said to have wool instead of hair; for that of the Angora goat is finer than the wool

wool of our wedders. This character, therefore, is not essential, but purely accidental, and even equivocal; for it may equally belong to these two species, or be wanting altogether, according to the differences of the climates. That of the horns appears to be still less certain; for they vary in number, size, figure, and direction. In our domestic sheep, the rams have generally horns, and the ewes have none. I have seen sheep not only with two, but with four horns. Those of the North and of Iceland have sometimes eight. In warm countries, the rams have only two short horns, and often want them, like the ewes. In some, the horns are smooth and round; in others, they are flat and chamfered. The points, instead of being bended backward, are sometimes turned outward, forward, &c. This character, therefore, is not more constant than the former; and, consequently, it is not sufficient to constitute different species*. Neither can the

* Linnaeus, with great propriety, instead of six species, has made six varieties only of domestic sheep. 1. *Ovis rustica cornuta*. 2. *Anglica mutica, cauda scrotoque ad genua pendulis*. 3. *Hispanica cornuta, spira extrorsum tracta*. 4. *Polycerata e Gothlandia*. 5. *Africana pro lana pilis brevibus hirta*. 6. *Laticauda platyura Arabica*; *Linnaeus Syst. nat. p. 97*. All these sheep are only varieties, to which this author should have added the *adimain* or Guiney sheep, and the *strepischeros* of Crete, instead of making them two different species. In the same manner, if he had seen the mouflon, and had known that it produced with the sheep, or had only consulted the passage of Pliny concerning the mouflon, he would never have ranked it with the goat,

the thickness, or length of the tail, answer this purpose ; since it may be considered as an artificial member, which by great care and abundance of good nourishment, may be enlarged at pleasure. Besides, among our domestic races, as in certain British sheep, there are some which have tails longer than the common kind. Our modern naturalists, however, trusting solely to the differences in the horns, the wool, and the largeness of the tail, have made seven or eight distinct species out of the sheep-kind. The whole of these we have reduced to one. And this reduction seems to be so well founded, that there is little prospect of its being overturned by future observations.

In composing the history of wild animals, we found it convenient to examine them one by one, without any regard to genus, but, in the domestic animals, on the contrary, it was necessary not only to adopt, but to increase the number of genera ; because in Nature there exist only individuals, and successions of individuals, that is, species. Men have had no influence on independent animals ; but they have greatly altered and modified the domestic kinds. We have, therefore, established physical and real genera,
 very

goat, but with the sheep. Brisson has not only placed the mouflon and strepsicheros, which he calls *hircus laniger*, among the goats, but he has made four distinct species of domestic sheep covered with wool, beside the domestic sheep of warm countries covered with hair, and the broad and long tailed sheep. All these seven we have reduced to a single species.

very different from those metaphysical and arbitrary ones, which have no existence but in idea. These physical genera are, in reality, composed of all the species, which, by our management, have been greatly variegated and changed; and, as all those species, so differently modified by the hand of man, have but one common origin in Nature, the whole genus ought to constitute but a single species. In writing, for example, the history of tigers, we have admitted as many species as are really found in different parts of the earth; because we are certain that man has never introduced any changes among these untractable and ferocious animals, who subsist at present in the same manner as they were originally produced by Nature. The same remark applies to all free and independent animals. But, in composing the history of oxen and sheep, we have reduced all the varieties of the oxen to one ox, and all the varieties of the sheep to one sheep; because it is equally certain that man, and not Nature, has produced the different kinds which we have enumerated. Every thing concurs in supporting this idea, which, though clear in itself, may not, perhaps, be sufficiently understood. That all the oxen produce together, we are assured by the experiments of M. de la Nux, Mentzelius, and Kalm: That all the sheep produce with one another, with the mouflon, and even with the goat, I know from my own experience. All the varieties of oxen, therefore, form but one species;

species; and all the sheep, however numerous their varieties, constitute only another species.

I am obliged, by the importance of the subject, to repeat, that Nature is not to be judged of by particular minute characters, and that by these the differences of species are not to be determined; that methodical distributions, instead of throwing light on the history of animals, render it still more obscure, by a fruitless multiplication of denominations, and of species; by forming arbitrary genera, which Nature never knew; by confounding real beings with creatures of imagination; by giving false ideas of the essential characteristics of species; and by mixing or separating them in an arbitrary manner, without skill, and often without having examined or even seen the individuals. It is for this reason that our Nomenclators perpetually deceive themselves, and publish nearly as many errors as lines. Of this we have already given so many examples, that nothing but the blindest and most obstinate prejudice can possibly resist the evidence they afford. On this subject M. Gmelin talks very sensibly, when treating of the animal under consideration*.

We

* The *argali*, or *stepnie-barani*, which occupy, says he, the southern mountains of Siberia, from the river Irtysh, as far as Kamtschatka, are extremely vivacious animals; and this vivacity seems to exclude them from the class of sheep, and to rank them with that of the stags. I shall here give a short description of them, from which

We are convinced, as M. Gmelin remarks, that we can never acquire a knowledge of Nature,

which it will appear, that neither sprightliness, nor inactivity, neither the wool nor hair with which an animal is covered, neither crooked nor straight horns, neither permanent horns, nor those which fall off annually, are marks sufficiently characteristic to distinguish classes. Nature loves variety; and I am persuaded, that, if we knew better how to manage our senses, they would often lead us to more essential characters, with regard to the differences of animals, than we generally derive from reason, which seldom apprehends those marks but in a superficial manner. In this animal, the external form of the head, neck, and tail, corresponds with that of the stag. His vivacity also, as formerly remarked, is so great, that he seems to be still more wild than the stag. The individual I saw, though reputed to be only three years old, ten men durst not attack. The largest of this species are about the size of a fallow deer. The one I examined measured, from the ground to the top of the head, a Russian ell and a half in height. His length, from the root of the horns, was an ell and three quarters. The horns rise above and very near the eyes, and just before the ears. They first bend backward and then forward in a circular form. The tips turn upward and outward. The horns, from the root to the middle, are furrowed, but afterward become somewhat smoother. It is probably from the figure of the horns that the Russians have called this animal the *wild sheep*. If we can trust the natives of these provinces, his whole strength lies in his horns. They say that the rams of this species fight by striking each other with their horns; and, when any of them are knocked off, the aperture at the base is so large, that the young foxes frequently take shelter in the cavity. It is not difficult to estimate the force necessary to break off, one of these horns, since they, as long as the animal lives, continue to augment both in thickness and length; and the part of the head also from which they spring, becomes always harder. It is said that a well grown horn, comprehending the curvatures, measures two ells in length; that it weighs between thirty

and

ture, but by a judicious use of our senses, by seeing, examining, comparing, and, at the same time,

and forty Russian pounds; and that, at the base, it is seven or eight inches in diameter. The horns of the one I saw were of a whitish yellow colour; but they turn browner and blacker as the animal advances in years. He carries his ears, which are pointed and tolerably large, very erect. The hoofs are divided, and the fore legs are three quarters of an ell long, and the hind legs still longer. When the animal stands erect on a plain, his fore legs are always fully extended and straight, and those behind are crooked; and this curvature seems to diminish in proportion to the inequality of the ground over which he passes. On the neck there are some pendulous folds. The colour of the body is grayish mixed with brown. Along the back, there is a yellowish or rather reddish line; and the same colour appears behind, on the inside of the legs, and on the belly, where it is a little paler. This colour continues from the beginning of August till the spring, at the approach of which these animals cast their hair, and become every where more red. They cast their hair a second time about the end of July. This description applies to the males. The females are always smaller; and though they have similar horns, they are smaller and thinner, and even acquire not thickness with age. The horns are nearly straight, have no furrows, and much resemble those of our castrated he-goats.

In the internal parts, they resemble other ruminating animals. The stomach is composed of four different cavities, and the gall-bladder is considerably large. Their flesh is good, and has nearly the same taste with that of the roebuck. The fat is delicious, according to the testimony of the Kamtschatkan nations. They feed upon herbage. They couple in autumn, and bring forth one or two lambs in the spring.

By the hair, the taste of the flesh, the figure and vivacity of this animal, it belongs to the class of the stag. By the permanent horns, it is excluded from this class. The circular horns give it some resemblance to the sheep. It is distinguished from that animal by its vivacity and want of wool. Its hair, its abode upon high rocks, and its frequent combats,

make

time, by denying ourselves the liberty of fabricating methodical distributions, contemptible systems, in which animals are classed which the authors never saw, and knew nothing more of them than their names, which are often ambiguous, obscure, and misapplied. The false employment of these names confounds ideas in a farrago of words, and drowns truth in a torrent of error. We are likewise convinced, after examining the mouflon alive, and comparing him with Gmelin's description, that the argali is the same animal. We formerly remarked, that this animal was found in Europe, and in pretty warm countries, such as Greece *, the island of Cyprus †, Sardinia,

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nia,

make it approach to the goats. But the crooked horns, and the want of a beard, exclude it from this class. Should we not rather regard this animal as constituting a particular class, and recognise it as the *musimon* of the ancients? In a word, it has a strong resemblance to Pliny's description of the *musimon*, and still more to that given by the learned Gesner; *Relation d'un voyage par terre à Kamtschatka, par Gmelin*. This curious relation is written by a man of good sense, and much versed in natural history.

* The tragelaphus of Belon is unquestionably our mouflon; and we perceive, from his remarks, that he saw, described, and drew a figure of this animal in Greece, and that it is found in the mountains between Macedonia and Servia.

† In the island of Cyprus, there are rams denominated by the ancient Greeks, according to Strabo, *musimones*, and called by the present Italians *musione*. Instead of wool, they are covered with hair, like that of goats; or rather their skin and hair differ little from those of the stag. Their horns resemble those of rams; but they are bent backward. They are as tall and as large as a middle sized stag. They run with great

nia, and Corfica *. But it is still more numerous in the southern mountains of Siberia, under a climate rather cold than temperate, where it even appears to be larger, stronger, and more vigorous. Hence it might equally supply the north and the south: Its offspring might be rendered domestic. After suffering long the hardships of this state, it would degenerate; and, according to the differences of climate and treatment, would assume relative characters, and new habits of body, which, being afterward transmitted by generation, gave rise to our domestic sheep, and all the other races formerly enumerated.

S U P P L E M E N T.

We have given the figure of a ram which was shown at the fair of St. Germain, in the year
1774,

great swiftness; but they never quit the highest and most rugged mountains. Their flesh is good and savoury. . . . The skins of these animals are dressed, and sent to Italy, where they go by the name of *cordoani* or *corduani*; *Descript. des Isles de l'Archipel, par Dapper, p. 50.*

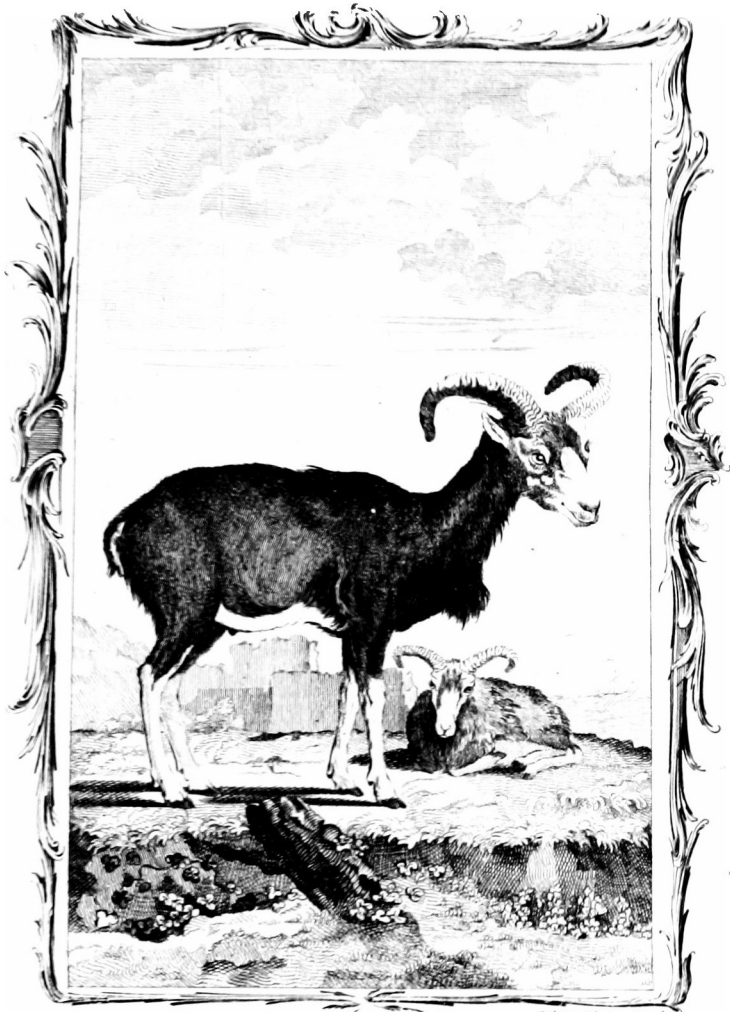
* His in insulis (Sardinia et Corfica) nascuntur arietes qui pro lana pilum caprinum producunt, quos musmones vocitant; *Strabo, lib. 5.*—Nuper apud nos Sardus quidam vir non illiteratus Sardiniam affirmavit abundare cervis, apris, ac damis, et insuper animali quod vulgo musflonem vocant, pelle et pilis (pilis capreae, ut ab alio quodam accepi, caetera fere ovi simile) cervo simile; cornibus arieti, non longis sed retro circa aures reflexis, magnitudine cervi mediocris, herbis tantum vivere, in montibus asperioribus versari, cursu velocissimo, carne venationibus expetita; *Gesner, Hist. quad. p. 823,*

1774, under the name of the *ram of the Cape of Good Hope*. This same ram was exhibited, the year preceding, under the denomination of the *Mogul ram with a thick tail*. But we learned that it was purchased at Tunis; and we think that it is the same with the Barbary sheep formerly represented, from which it differs only by the shortness of its tail, which is also flatter, and broader in the upper part. The head is likewise proportionally thicker, and resembles that of the Indian ram. The body is well covered with wool, and the legs are short, even when compared with those of our own sheep. The figure and size of the horns differ little from those of the Barbary sheep. We have called it the *ram of Tunis*, to distinguish it from the other; but we are persuaded that they both belong to the same country of Barbary, and that they are very nearly of the same race.

We have likewise given the figure of a ram, which was exhibited at the fair of Saint-Germain, in the year 1774, under the name of the *morvant of China*. This ram is remarkable for a kind of mane on his neck, and for long hairs which hang down from his throat, and form a kind of cravat. These hairs are a mixture of red and gray, hard to the touch, and about ten inches long. The hairs of the mane are red, not very thick, extend as far as the middle of the back, and are of the same colour and consistence as those on the throat; but they are shorter, and
mixed

mixed with some brown and black hairs. The wool which covers the body is a little curled, and soft at the extremity; but, near the skin of the animal, it is straight and hard: In general, it is about three inches long, and of a bright yellow colour. The legs are of a deep red, and the head is spotted with different shades of yellow. The greatest part of the tail is yellow and white, and in figure resembles that of a cow, being well furnished with hair toward the extremity. This ram stands lower on his legs than the common kind, and he resembles the Indian ram more than any other. His belly is very large, and not above fourteen inches nine lines raised from the ground. M. de Seve, who described this animal, adds, that, from the grossness of the belly, this ram had the appearance of a pregnant ewe. The horns are nearly the same with those of our rams. But the hoofs are not prominent, and they are longer than those of the Indian ram.

We formerly remarked, and now repeat, that the mouflon is the primæval stock of all the other sheep, and that his constitution is sufficiently robust to enable him to subsist in cold, temperate, and warm climates. The wild rams of Kamtschatka, says M. Steller, have the air of a goat, and the hair of a rein-deer. Their horns are so large, that some of them weigh from twenty-five to thirty pounds. Spoons and other utensils are made of them. These rams are as active and nimble as roebucks. They inhabit
the



A. Bell's sculp.

MUFFLON.



ICELAND RAM.

A. Bell sculp. 5



BARBARY WEDDER.



Albert Soult.

INDIAN RAM.



INDIAN EWE.



INDIAN RAM.



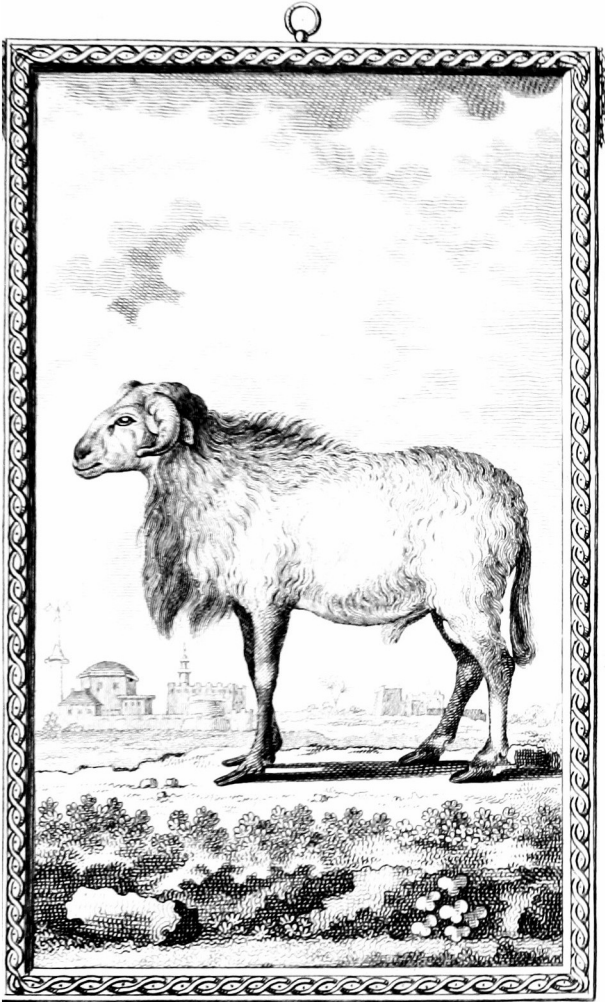
ICELAND EWE.

W. Bell sculp.



Abdellatif

RAM of TUNIS.



A. Bell sculp.

MORVANT

the precipices of the most rugged mountains. Their flesh is exceedingly delicate ; but they are hunted chiefly for the sake of their furs.

I believe that few of the genuine mouflons now exist in Corsica. The frequent wars which happened in that island have probably accomplished their destruction. But, in the figure of their present races of sheep, we still find marks of the former existence of the mouflon. In the month of August 1774, we saw a Corsican ram, which belonged to the Duc de la Vrillière. It exceeded not the size of a French sheep. It was white, low on its legs, and had long hair disposed in locks. It had four large horns, the upper two being more bulky than the under, and they had rugosities like those of the mouflon.

T H E

T H E A X I S*.

THIS animal being known only under the vague names of *Sardinian hind*, and *stag of the Ganges*, we have preserved the appellation given to it by Belon †, which he borrowed from Pliny,

* Deer with slender trifurcated horns; the first branch near the base, and the second near the top, each pointing upwards. It is of the size of the fallow deer, of a light gray colour, and the body is beautifully marked with white spots. Along the lower part of the sides, next the belly, is a line of white. The tail, which is as long as that of a fallow deer, is red above, and white beneath; *Pennant's Synops. of quad. p. 51.*

Axis; Plinii lib. 8. cap. 21. Belon. Obs. p. 119. Raii Synops. quad. p. 83.

Speckled deer; *Nieuhoff. voy. p. 262.*

Biche de Sardaigne; *Mem. pour servir à l'hist. des animaux, part. 2. p. 73. tab. 45.*

† “ In the court of this castle, there were a male and a female of a kind of *stag* or *fallow deer*, which we would never have recognised, if we had not suspected that it was the *axis* mentioned by Pliny, (*lib. 8. cap. 21.*) in the following words: *In India . . . et feram nomine Axim, hinnuli pelle, pluribus candidioribusque maculis, sacram Libero Patri.* Both of them wanted horns, and, like the fallow deer, had a long tail that hang as low as the hocks, by which we knew that they were not stags; and in fact, at first sight, we thought they were fallow deer. But, upon a closer examination, we rejected this opinion. The female is smaller than the male; and their skin was variegated with round, white spots. The ground colour of the body was yellowish, and white on the belly. In this article they differ from the camelopard; for the ground colour of the camelopard is white, and the spots are reddish. Their voice

is

Pliny, both because the characters correspond with Pliny's axis, and the name has never been applied to any other quadruped; and, therefore, we are in no danger of falling into error or confusion; for a generic denomination, accompanied with an epithet derived from the climate, is not a name, but a phrase by which an animal may be confounded with others of its own genus, as the present animal with the stag, though, perhaps, it is different both in species and in climate. The axis is one of the small number of ruminating animals which carry horns, like those of the stag. He has the stature and swiftness of the fallow-deer. But, what distinguishes him from both, he has the horns of the stag, and the figure of the fallow deer; his whole body is marked with white spots, elegantly disposed, and separate from each other; and, lastly, he is a native of warm climates*. But the hair of the stag

is clearer than that of the stag; for, having heard them bray, we were certain that they could neither be fallow deer nor stags, and, therefore, believed them to be the *axis* of the ancients;" *Belon, observ. p. 119.*

* This animal was in the royal managerie, under the name of the *Ganges stag*. From this denomination, as well as from the passages of Pliny and Belon, it appears that he is a native of warm countries. The testimonies of travellers, which we are about to quote, confirm this fact, and at the same time prove, that the common species of the stag is not much diffused beyond the temperate climates. 'I never saw, says le Maire, 'stags at Senegal with horns like those of France;' *Voyage de le Maire, p. 190.*—'In the peninsula of India, on this side the Ganges, there are stags whose bodies are all inter-
' speckled

stag and fallow-deer is generally of a uniform colour, and they are very numerous in cold and temperate regions, as well as in warm climates.

The gentlemen of the Academy of Sciences have given a figure and a description of the internal parts of this animal *; but they have said little concerning its external form, and nothing relative to its history. They have simply called it the *Sardinian hind*, probably because it was brought to the royal menagerie under that name. But we have no evidence of this animal's being a native of Sardinia. It is mentioned by no author as existing wild in this island: On the contrary, we see, from the passages already quoted, that it is found in the warmest countries of Asia. Hence the denomination of *Sardinian hind* has been falsely applied: That of *Ganges stag* would have been more proper, if it had belonged to the
stag

* 'spersed with white spots;' *Voyage de la Compagnie des Indes de Hollande, tom. 4. p. 423.*— At Bengal, we find stags which 'are spotted like tigers;' *Voyage de Luillier, p. 54.*

* The height of these hinds, from the top of the back to the tail, was two feet eight inches. The neck was a foot long, and the hind legs three feet. Their hair was of four colours, namely, yellow, white, black, and gray. It was white on the belly and on the inside of the thighs and legs. The back was a yellowish brown, and the flanks were of a dun yellow, or isabella colour. These ground colours were variegated with white spots, of different figures. Along the back were two rows of spots in a straight line; the other spots were scattered without any order. On each side of the flanks there was a white line. The neck and head were gray; the tail was all white below, black above, and the hair of it was six inches long; *Mem. pour servir à l'hist. des animaux, part. 2. p. 73.*

stag species, because that part of India, through which the Ganges runs, appears to be its native country. It seems, however, to be likewise found in Barbary *, and it is probable that the spotted fallow deer of the Cape of Good Hope is the same animal †.

We formerly remarked, that no species ‡ made so near an approach to another, as the fallow deer to the stag. The axis, however, seems to form an intermediate shade between the two. It resembles the fallow deer in the size of the body, the length of the tail, and in a kind of livery which it perpetually wears: There is no essential difference but in the horns, which want brow antlers, and resemble those of the stag. The axis, therefore, may be a variety only, and not a different species from that of the fallow deer; for, though it is an original native of the warmest countries of Asia, it easily subsists and multiplies in Europe. There are flocks of them in the menagerie of Paris. They produce among themselves with equal facility as the fallow deer.

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They

* The Arabs call likewise a species of fallow deer *Bekker-el-Wash*, which has the horns of a stag, but is not so large. Those which I saw had been taken in the mountains near Szigata, and appeared to be of a mild and tractable disposition. The female had no horns, &c.; *Shaw's Travels*.

† We saw, at the Cape of Good Hope, a kind of spotted fallow deer, which were somewhat smaller than those of Europe. . . . Their spots were white and yellow. They always go in flocks; *Descript. du Cap. de Bonne-Esperance, par Kolbe, tom. 1. p. 120.*

‡ See the article *Fallow deer*, vol. IV. of this work.

They have never been observed, however, to intermix with the fallow deer, nor with the stags, which has led us to presume that they are not a variety either of the one or of the other, but a distinct intermediate species. But, as no decisive experiments have been made on this subject, as no necessary means have been used to oblige these animals to join, we do not assert positively that they belong to different species.

We have already seen, under the articles *stag* and *fallow deer*, how liable these animals are to varieties, especially in the colour of their hair. The species of the fallow deer and stag, without being numerous in individuals, are very much diffused. Both are found in either Continent, and both are subject to a great number of varieties, which seem to form permanent races. The white stags, whose race is very ancient, since they are mentioned by the Greeks and Romans, and the small brown stags, which we have called *Corfican stags*, are not the only varieties of this species. In Germany, there is another race, known in that country under the name of *Brandhirtz* *, and by our hunters under that of the *stag of Ardenne*s. This stag is larger than the common kind, and differs from the others not only

* Alterum cervi genus, ignotius, priore majus, pinguius, tum pilo densius et colore nigrius; unde Germanis a femiulli ligni colore *Brandhirtz* nominatur: Hoc in Misene falibus Boemiae vicinis reperitur; *Fabricius, apud Gesner, Hist. quad. p. 297.*

only in its deeper and almost black colour, but by long hair between the shoulders and on the throat. This kind of mane and beard give him some relation, the first to the horse, and the second to the he-goat. The ancients bestowed on this stag the compound names of *hippelaphus* and *tragelaphus*. As these denominations have occasioned many critical discussions, in which the most learned naturalists by no means agree, and as Gesner *, Caius, and others, tell us that the *hippelaphus* was the rain deer, we thought it proper here to give the reasons which make us think differently, and lead us to believe, that the *hippelaphus* of Aristotle, is the same animal with the *tragelaphus* of Pliny, and that both these names equally denote the stag of Ardennes.

Aristotle † gives to his *hippelaphus* a kind of mane upon the neck and top of the shoulders, a beard

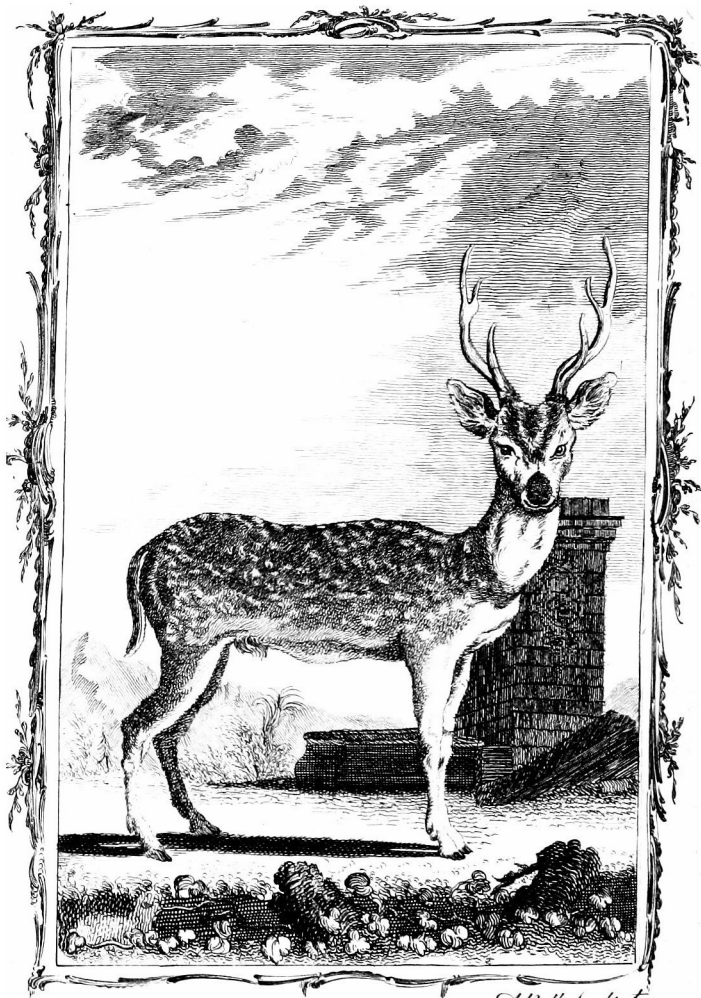
* Gesner Hist. quad. p. 491. et 492.

† Quinetiam *hippelaphus* satis jubae summis continet armis, qui a forma equi et cervi, quam habet compositam, nomen accepit, quasi equicervus dici meruisset. . . . Tenuissimo jubae ordine a capite ad summos arcos crinescit. Proprium equicervo villus qui ejus gutturi, modo barbae, dependet. Gerit cornua utrinque, excepta foemina. . . . et pedes habet bisulcos. Magnitudo equicervi non dissidet a cervo. Gignitur apud Arachotas, ubi etiam boves sylvestres sunt, qui differunt ab urbanis, quantum inter suos urbanos et sylvestres interest. Sunt colore atro, corpore robusto, rictu leviter adunco; cornua gerunt resupinatiores. Equicervo cornua sunt *Caprae* proxima; *Arist. Hist. anim. liv. 2. cap. 1. Nota.* Theodore Gaza, whose Latin version we have quoted, has falsely translated *Δορκαας* *capra*, instead of *caprea*. Hence the word *capreae* should be substituted for *caprae*, that is, the *roe deer*, in place

beard under the throat, horns to the male similar to those of the roebuck, and no horns to the female. He says that the hippelaphus is as large as the stag, and is produced among the Arachotas, a people of India, where there are also wild oxen, whose bodies are very robust, their skin black, their muzzle elevated, and their horns bended more backward than those of the domestic ox. It must be acknowledged, that Aristotle's characters of the hippelaphus will apply almost equally well to the rain deer and to the stag of Ardennes. They have both long hair upon the neck and shoulders, and likewise on the throat, which forms a kind of beard upon the gullet, and not on the chin. But the hippelaphus, which is only of the size of the stag, differs in this particular from the rain deer, which is much larger; but what appears to decide this question, the rain deer being an animal peculiar to cold countries, never existed among the Arachotas. This country of the Arachotas is one of the provinces which Alexander over-ran in his expedition into India. It is situated beyond Mount Caucasus,

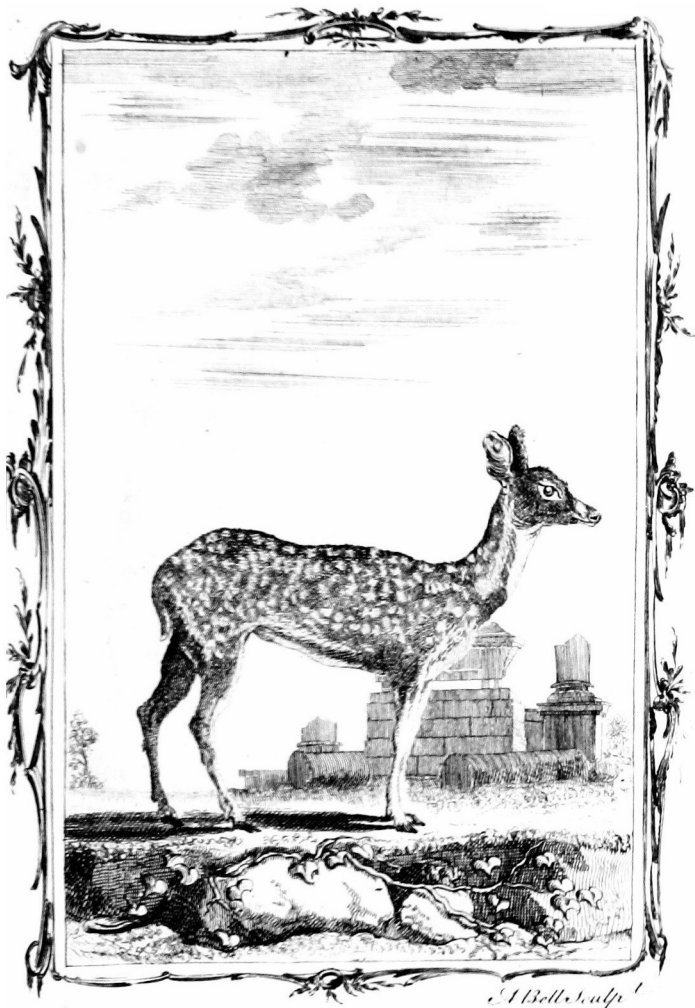
between

place of the *she-goat*. The wild oxen, here mentioned by Aristotle, appear to be buffaloes. The short description he has given of them, the climate, their resemblance to the ox, and their black colour, have made this philosopher believe that they differed not more from the domestic oxen, than the wild boar from the common hog. But, as we formerly remarked, the buffalo and ox are two distinct species. If the ancients have bestowed no particular name on the buffalo, it is because this animal was a stranger to them, because their knowledge of him was imperfect, and they regarded him as a wild ox, which differed from the domestic ox by some slight varieties only.



A Bell Sculpt

AXIS



FEMALE AXIS

between Persia and India. This warm country never produced rain deer; for they cannot subsist in temperate countries, and are found only in the northern regions of both Continents. The stags, on the contrary, have no particular attachment to the north; for they are very numerous both in temperate and warm climates. Hence the hippelaphus of Aristotle, which is found among the Arachotas, and in the same countries with the buffalo, is unquestionably the stag of Ardennes, and not the rain deer.

Now, if we compare what Pliny has said of the tragelaphus, with what Aristotle has advanced concerning the hippelaphus, and both with nature, we will perceive that the tragelaphus is the same animal with the hippelaphus, and consequently the same with our stag of Ardennes. Pliny remarks * that the tragelaphus belongs to the species of stag, and differs from him only by the beard and the hair on its shoulders. These characters are positive, and can only apply to the stag of Ardennes; for Pliny, in another place, mentions the rain deer under the name of *Alca*. He adds, that the tragelaphus is found in the neighbourhood of Phasis, which still farther agrees with the stag, and not with the rain deer. We may, therefore, safely pronounce, that the tragelaphus of Pliny, and the hippelaphus of Aristotle, both denote the animal which we call the

* Eadem est specie (cervi videlicet) barba tantum, et armorum villo distans quem *tragelaphon* vocant, non alibi quam juxta Phasin amnem, nascens; *Plin. Hist. Nat. lib. 8. cap. 33.*

the *stag of Ardennes* ; and that the axis of Pliny is the animal commonly denominated the *Ganges stag*. Though names have no influence upon nature, the explication of them is of great use to those who study her productions.

S U P P L E M E N T.

In the year 1765, the Duke of Richmond had, in his parks, a number of that species of the fallow deer, commonly known by the name of *Ganges stags*, and which I have called *axis*. Mr Colinson assures me, that they propagated with the ordinary kind of fallow deer.

‘ They live spontaneously,’ he remarks, ‘ with the fallow deer, and form not separate flocks. It is more than sixty years since this species existed in England, where they had been transported before the white and black fallow deer, and even before the stag, which last, I suppose, was brought from France ; because, previous to that period, there were in England only the common fallow deer, and the Scots roebuck. But, beside this first species, we have now the axis, the black, the yellow, and the white fallow deer. The mixture of all these colours has produced most beautiful varieties *.’

In the year 1764, we had a male and female Chinese fallow deer at the menagerie of Versailles.

In

* Lettre de M. Colinson à M. de Buffon.

In height, they exceeded not two feet four inches. The body and tail were of a dark brown colour, and the belly and limbs of a bright yellow. The legs were short, the horns large and garnished with antlers. This species, though smaller than the common fallow deer, and even than the axis, is perhaps only a variety of the latter, though it has no white spots; but, instead of these white spots, it had, in some places, large yellow hairs, which had a considerable effect upon the brown colour of the body. In fine, the colour of the female was the same as that of the male; and, it is probable, that the race might not only be perpetuated in France, but that it might even intermix with the axis, especially as both these animals are natives of the eastern regions of Africa.

The

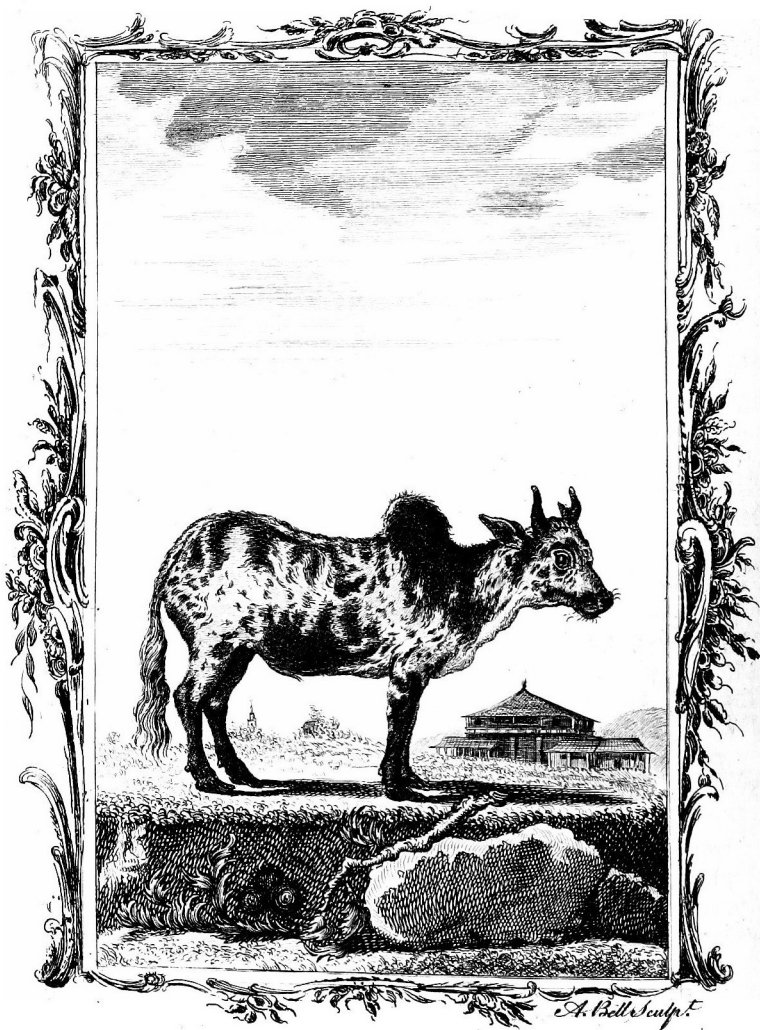
The ZEBU, or DWARF OX*.

THIS small ox was mentioned above, under the article Buffalo, p. 164. But as, since that article was printed, a zebu has been brought to the royal menagerie, we are now in a condition to speak of it with more certainty, and to give a figure of it drawn from the life, with a more perfect description than the former one.

* The zebu from which the following description was taken, was not larger than a calf of five weeks old. We knew it, however, to be an adult, and at least seven or eight years of age, by inspection of its teeth. It arrived at the menagerie of Versailles in the month of August 1761, and its horns were then as large as they are now in the year 1763. They are five inches three lines long, and four inches three lines in circumference at the base. They are black at the points, and in every other respect resemble those of the common ox. It has a bunch on the withers four inches and a half high, and its circumference at the base is sixteen inches. In other articles, it differs not in figure from our ox, excepting that its legs and feet are proportionally smaller, and its ears longer.

The tuft of hair above the coronet is black. The legs and upper part of the tail are yellowish. The under part, and the long hairs at the point of the tail, are white, and a foot in length. The rest of the body is variegated with black and brown spots, of different dimensions, and slightly tinged with a reddish colour.

“ Dwarf ox, with horns almost close at their base, broad and flat at the beginning, receding in the middle, and standing erect. It is larger than a roebuck, less than a stag, and compact, and well made in all its limbs. Its hair is shining, and of a tawny colour. Its legs are short, neck thick, and
shoulders



A. Bell sculpt.

ZEBU.

one. I have also learned, from fresh inquiries, that the zebu is probably the same animal that is called the *Lant* *, or *Dant* †, in Numidia, and several other northern provinces of Africa, where it is very common; and that the name *Dant*, which solely pertains to the animal under consideration, has been transported from Africa to America, and given to an animal which has no resemblance to the former but in the size

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shoulders a little elevated. The tail is terminated with long hairs, twice as coarse as those of a horse.—It is only a variety of the Indian ox;” *Pennant’s Synops. of quad. p. 9.*

Un moult beau petit boef d’Afrique; *Belon, p. 119.*

Bos cornibus aure brevioribus, dorso gibbo, juba nulla;
Linna. Syst. Nat. p. 99.

* *Lant* bovem similitudine refert, minor tamen cruribus et cornibus elegantius; colorem album gerit, unguibus nigerrimis; tantaeque velocitatis ut a reliquis animalibus, praeterquam ab equo barbarico, superari nequeat. Facilius aestate capitur quod arenae aestu cursus velocitate ungues dimoveantur, quo dolore affectus cursum remittit, &c.; *Leonis Afric. Africae descript. vol 2. p. 751.*

† The *Dant*, which the Africans call *Lampt*, is of the figure of a small ox, but its legs are short.—It has black horns, which bend round, and are smooth. Its hair is whitish, and its hoofs are black and cloven. It is so swift that no animal, unless the Barbary horse, can overtake it. These animals are said to be more easily taken in summer; because, by the force of running, their hoofs are worn among the burning sands, and the pain occasioned by this circumstance makes them stop short, like the stags and fallow deer of these deserts. There are numbers of these dants in the deserts of Numidia and Lybia, and particularly in the country of the Morabitains. Of their skins the natives make excellent shields, the best of which are proof against arrows.

of its body, and belongs to a very different species. This American dant is the tapir or the maipouri; and, to prevent the African dant, which is our zebu, from being confounded with the tapir, we shall give the history of the latter in the subsequent article.

The

The T A P I R*.

THIS is the largest animal of the New World, where, as formerly remarked, animated Nature seems to be contracted, or rather

* The tapir has the fore-hoofs divided into four, and the hind-hoofs into three parts. The nose extends far beyond the under jaw, is slender, and forms a sort of proboscis; it is capable of being contracted or extended at pleasure, and its sides are sulcated. The extremities of both jaws end in a point, and there are ten cutting teeth in each. Between them and the grinders, there is a vacant space, and there are ten grinders in each jaw. The ears are erect, the eyes small, and the body shaped like a hog. The back is arched, the legs short, and the hoofs small, black, and hollow. The tail is very small. The animal grows to the size of a heifer of half a year old. The hair is short; when young, it is spotted with white, when old, it is of a dusky colour; *Pennant's synopsis of quad.* p. 82.

Tapir is the Brasilian name of this animal.

Tapira; *Voyage de la riviere des Amazones, par Condamine*, p. 163.

Tapierete Brasiliensibus; *Marcgr. et Piso*.

Tapirouffou; *Voyage au Brasil, par Lery*, p. 154.

This animal, which is not only found in Brasil, but in Guiana and Peru, is called *Maipouri* in Galibi language upon the Guiana coast, and *Vagra* at Peru; *Condamine, ibid.*

Maipouri or *Manipoure*; *Hist. de la France Equin. par Barre*, p. 160

Anta; *Marcgrave, Brasil.* p. 229. *Piso, Brasil.* p. 101. *Nieuhoff's voy.* p. 23. *Raii Synopsis quad.* p. 126. *Klein. quad.* p. 36.

Danta;

rather not to have had time sufficient to acquire her full dimensions. Instead of the huge masses produced by the ancient lands of Asia, instead of the elephant, rhinoceros, hippopotamus, camelopard, and camel, all the creatures of these new lands are modelled upon a small scale. The tapirs, the lamas, the pacos, and the cabiais, are twenty times smaller than the animals of the Old World to which they should respectively be compared. Here matter is not only used with a niggardly hand, but even forms are imperfect, and seem to have failed or been neglected. Almost the whole animals of South America, which alone can be regarded as peculiar to the New World, have neither tusks, horns, nor tails. Their figure is aukward; their bodies and members are ill proportioned; and some of them, as the ant-eaters, the sloth, &c. are so miserably formed, that they have hardly the powers of moving, or eating their food. With
much

Danta; *Condamine*, 163. *Relat. de la riviere des Amazones*, par *Christ. Acuna*, tom. 2. p. 157. *Hist. de Paraguai*, par *Charlevoix*, tom. 1. p. 32. *Hist. Nat. des Indes*, par *Joseph Aosta*, p. 204.

Ante; *Herrera*, *Descript. des Indes Occidentales*, p. 25. *Hist. des Indes*, par *Maffée*, p. 69.

Beori; *Hist. gen. des voyages*, par *M. l'Abbé Prevot*, tom. 2. p. 636.

Elephant hog; *Waser's voy. in Dampier*, vol. 3. p. 400.

Mountain cow; *Dampier*, vol. 2. p. 102.

Sus aquaticus multifulcus; *Barrere*, *Hist. Fr. Equin.* p. 160.

Species of hippopotamus, or river horse; *Bancraft's Guiana*, p. 127.

much difficulty they drag out a painful and languishing life in the solitudes of the desert, and cannot subsist in inhabited regions, where man and the stronger animals would soon destroy them.

The tapir is of the size of a small cow, or zebu ; but has neither horns nor tail. His legs are short, and his body arched. When young, he is spotted, like the stag ; and afterwards his hair becomes of a uniform deep brown colour. His head is large, and terminates, like that of the rhinoceros, in a long trunk. He has ten cutting teeth and an equal number of grinders in each jaw, a character which separates him entirely from the ox kind, and from all other ruminating animals. As we have only some skins of this animal, and a drawing sent us by M. Condamine, we cannot do better than transcribe the descriptions of him made from the life by Marcgrave * and Barrere, subjoining, at the same time,

* *Tapiere* Brasiliensibus, Lusitanis *Anta*. Animal quadrupes, magnitudine juveni semestris ; figura corporis quodammodo ad porcum accedens, capite etiam tali, verum crassiori, oblongo, superius in acumen desinente ; promuscide super os prominente, quam validissimo nervo contrahere et extendere potest ; in promuscide autem sunt fissurae oblongae ; inferior oris pars est brevior superiore. Maxillae ambae anterieus fastigiatae, et in qualibet decem dentes incisores superne et inferne ; hinc per certum spatium utraque maxilla caret dentibus, sequuntur dein molares grandes omnes, in quolibet latere quinque, ita ut haberet viginti molares et viginti incisores. Oculos habet parvos porcinos, aures obrotundas, majusculas,

time, what has been said concerning him by travellers and historians. The tapir seems to be a gloomy, melancholy animal*. He comes a-
broad

jufculas, quas versus anteriora furrigit. Crura vix longiora porcinis, et crassiuscula; in anterioribus pedibus quatuor ungulas, in posterioribus tres; media inter eas major est in omnibus pedibus; in prioribus pedibus tribus, quarta parvula exterius est adjuncta: Sunt autem ungulae nigricantes, non solidae sed cavae, et quae detrahi possunt. Caret cauda, et ejus loco processum habet nudum pilis, conicum, parvum more *Cutian* (Agouti.) Mas membrum genitale longe exte- rere potest, instar cercopithecii: Incedit dorso incurvato ut *Capybara* (Cabiari.) Cutem solidam habet instar alcis, pilos bre- ves. Color pilorum in junioribus est umbrae lucidae, macu- lis variegatus albicantibus ut capreolus; in adultis fuscus sive nigricans sine maculis. Animal interdiu dormit in opacis sil- vis latitans. Noctu aut mane egreditur pabuli causa. Op- time potest natate. Vescitur gramine, arundine saccharifera, brassica, &c. Caro ejus comeditur, sed ingrati saporis est; *Marcgr. Hist. Brasil. p. 229.*—The tapir or *Maypouri* is an amphibious animal, being oftener in the water than on the land, to which he resorts from time to time, in order to browse the more tender herbage. His hair is very short, and interspersed with black and white bands, which extend from the head to the tail. He makes a kind of hissing or whistling noise; and seems to partake a little both of the mule and the hog. We find *manipouris*, as they are called by some people, in the river Onyapok. His flesh is coarse and ill tasted; *Barrere, Hist. nat. de la France equin. p. 160.*

* *Tapierete*, bestia iners et fociors—apparet, adeoque luci- fuga ut in densis mediterraneis silvis interdiu dormire amet: Ita ut, si detur animal aliquod, quod noctu tantum nunquam vero de die venetur, haec sane est Brasiliensis bestia, &c.; *Hist. nat. Brasil. p. 101.*—During the day, the anta browses herbage, and, in the night, he eats a kind of clay found in the marshes, to which he retires when the sun sets.—The antas are hunted during the night, and it is not a difficult business.

broad in the night only, and delights in the water, where he dwells oftener than on the land. He lives in the marshes, and never wanders to any great distance from the margins of rivers and lakes. When alarmed, pursued, or wounded, he plunges into the water *, remains long under it, and passes over a considerable space before he makes his appearance. These habits, which he possesses in common with the hippopotamus, have induced some naturalists to suppose that he belongs to the same species †. But these animals are as remote from each other in their natures, as the countries they inhabit. To be ascertained of this fact, we have only to compare the above descriptions with that we have given of the hippopotamus. Though both inhabit the water, the tapir does not feed upon fishes; and, though his mouth is armed with
 twenty

business. They hunt these animals in their retreats, where they assemble spontaneously in flocks; and, as soon as they approach, the hunters run up to them with burning torches, with which they are so dazzled and confounded, that they overturn one another, &c.; *Hist. du Paragui, par le P. Charlevoix, tom 1. p. 33.*—The antas conceal themselves during the day in their dens, and come out in the night to feed; *Descript. des Indes Occidentales, par Herrera, p. 251.*

* The manipouri is a kind of wild mule. We shot at one, but did not kill him. Unless the ball or arrow pierce his flanks, he generally escapes, particularly when water is near; for he instantly plunges into it, and quickly gains the opposite bank; *Lettres edifiantes, recueil. 24. Lettre du P. Fauche.*

† Hippopotamus amphibius pedibus quadrilobis; habitat in Nilo.—Hippopotamus terrestris pedibus posticis trifurcatis. Tapiere habitat in Brasilia; *Linn. syst. nat. p. 74.*

twenty sharp cutting teeth *, he is not carnivorous. He lives upon plants and roots, and never uses his weapons against other animals. His dispositions are so mild and timid, that he declines all hostilities; and flies from every danger. Though his legs are short and his body heavy, he runs very swiftly, and he swims still better than he runs. The texture of his skin † is so close and firm, that it often resists a musket ball. His flesh is coarse and insipid; but it is eaten by the Indians ‡. He is found in Brasil, in Paraguay, in Guiana, in the country of the Amazons ||, and throughout all South America, from the extremity of Chili to New Spain.

O F

* Though the tapirouffou has sharp teeth, his only defence is flight, and he is by no means dangerous. The Savages kill him with arrows, or entrap him with snares; *Voyage de Lery, p. 152.*

† The tapirouffou is in great request among the Savages, on account of his skin; for, after drying it, they cut it into round shields as large as the bottom of a ton.—This skin, when dried, is so hard that I believe no arrow can pierce it; *Idem.*

‡ The flesh of the manipouri is coarse, and has a disagreeable taste; *Lettres edifiantes, recueil 24. p. 347.*

|| In the environs of the river of the Amazons, we find an animal called *danta*. It is of the size of a mule, which it resembles in colour and the figure of its body; *Relation de la riviere des Amazones, par Gbrist. d'Acuna, tom. 2. p. 177.*—The elk, which is found in some of the woods near Quito, is not rare in the Amazon woods, nor in those of Guiana. I here give the name of *elk* to the animal which the Spaniards and Portuguese call the *Danta*; *Voyage de la riviere des Amazones, par M. de la Condamine, p. 163.*



A. Bell's sculp.

TAPIR.

O F N A T U R E.

F I R S T V I E W.

NATURE is that system of laws established by the Creator for regulating the existence of bodies, and the succession of beings. Nature is not a body; for this body would comprehend every thing. Neither is it a being; for this being would necessarily be God. But Nature may be considered as an immense living power, which animates the universe, and which, in subordination to the first and supreme Being, began to act by his command, and its action is still continued by his concurrence or consent. This power is that portion of the divine power which manifests itself to men. It is at once the cause and the effect, the mode and the substance, the design and the execution. Very different from human art, whose productions are only dead works, Nature is herself a work perpetually alive, an active and never ceasing operator, who knows how to employ every material, and, though always labouring on the same invariable plan, her power, instead of being lessened, is perfectly inexhaustible. Time, space, and matter, are her means; the universe her object; motion and life her end.

The phaenomena of the universe are the effects of this power. The springs she employs are active forces, which time and space can only measure and limit, but never destroy; forces which balance, mix, and oppose, without being able to annihilate each other. Some penetrate and transport bodies, others heat and animate them. Attraction and impulsion are the two principal instruments by which this power acts upon brute matter. Heat and organic particles are the active principles she employs in the formation and expansion of organized beings.

With such instruments, what can limit the operations of Nature? To render her omnipotent, she wants only the power of creating and annihilating. But these two extremes of power the Almighty has reserved to himself alone. To create and to annihilate, are his peculiar attributes. To change, to destroy, to unfold, to renew, to produce, are the only privileges he has conferred on another agent. Nature, the minister of his irrevocable commands, the depositary of his immutable decrees, never deviates from the laws he has prescribed to her. She alters no part of his original plan; and, in all her operations, she exhibits the seal of the eternal Lord of the universe. This divine impression, this unalterable prototype of all existence, is the model upon which she operates; a model, all the features of which are expressed in characters so strongly marked, that nothing can possibly efface;

face; a model which the number of copies or impressions, though infinite, instead of impairing, only renews.

Every thing, therefore, has been created, and nothing is annihilated. Nature vibrates between these two extremes, without ever approaching either the one or the other. Let us endeavour to lay hold of her in some points of this vast space which she has filled and pervaded from the beginning of ages.

What an infinity of objects! an immense mass of matter, which would have been created in vain, if it had not been divided into portions, separated from each other by spaces a thousand times more immense. Thousands of luminous globes, placed at inconceivable distances, are the bases which support the fabric of the universe; and millions of opaque globes, which circulate round the former, constitute the moving order of its architecture. These great masses are revolved, and carried through space, by two primitive forces, each of which acts continually; and their combined efforts produce the zones of the celestial spheres, and establish, in the midst of vacuity, fixed stations and determined routes or orbits. It is motion that gives rise to the equilibrium of worlds, and the repose of the universe.

The first of these forces is equally divided; the second is distributed in unequal proportions. Every atom of matter has the same quantity of
attractive

attractive force ; and a different quantity of impulsive force is assigned to each individual globe. Some stars are fixed, and others wandering. Some globes seem to be destined for attracting, and others for impelling, or being impelled. There are spheres which have received a common impulsion in the same direction, and others a particular impulsion. Some stars are solitary, and others accompanied with satellites : Some are luminous, and others opaque masses. There are planets, the different parts of which successively enjoy a borrowed light, and comets, which lose themselves in the profundity of space, and return, after many ages, to receive the influence of solar heat. Some suns appear and disappear, and seem to be alternately kindled and extinguished ; others exhibit themselves for once, and then vanish forever. Heaven is a country of great events ; but the human eye is hardly able to perceive them. A sun, which perishes, and destroys a world, or a system of worlds, has no other effect on our eyes than an ignis fatuus, which gives a transitory blaze, and appears no more. Man, limited to the terrestrial atom on which he vegetates, views this atom as a world, and sees worlds only as atoms,

The earth which man inhabits, hardly perceptible among the other globes, and totally invisible to the distant spheres, is a million of times smaller than the sun by which it is illuminated, and a thousand times smaller than some other planets, which are also subjected to the
power

power of the sun, and obliged to circulate around him. Saturn, Jupiter, Mars, the Earth, Venus, Mercury, and the Sun, occupy the small part of the heavens which we call *our Universe*. All these planets with their satellites, moving with rapidity in the same direction, and nearly in the same plane, compose a wheel of an immense diameter, whose axis supports the whole weight, and which, by the celerity of its own rotation, must inflame and diffuse heat and light to every part of the circumference. As long as these movements continue, (and they will be eternal, unless the hand of the prime Mover interpose, and exert as much force to destroy, as was necessary to create them), the sun will burn, and fill all the spheres of this universe with his splendour: And as, in a system where all bodies attract each other, nothing can be lost, or remove without returning, the quantity of matter remaining always the same, this fertile source of light and life can never be dried up or exhausted; for the other suns, which likewise dart forth their fires continually, restore to our sun as much light as they receive from him.

The comets, which are much more numerous than the planets, and, like the latter, depend on the power of the sun, press also on this common focus, and, by augmenting the weight, increase the inflammation. They constitute a part of our universe; for, like the planets, they are subjected to the attraction of the sun. But, in their
projectile

projectile or impelled motions, they have nothing in common, either among themselves, or with the planets. Each circulates in a different plane; and they describe orbits in very different periods of time; for some perform their revolutions in a few years, and others require several centuries. The sun, revolving round his own centre, remains, in other respects, perfectly at rest in the midst of the whole, and serves, at the same time, as a torch, a focus, and an axis to all the parts of this vast machine.

It is by his magnitude alone that the sun remains immoveable, and regulates the motions of the other globes. As the force of attraction is proportioned to the mass of matter, as the sun is incomparably larger than any of the comets, and contains a thousand times more matter than the largest planet, they can neither derange him, nor diminish his influence, which, by extending to immense distances, restrains the whole, and, at fixed periods, recalls those which have stretched farthest into the regions of space. Some of them, when they return, make so near an approach to the sun, that, after cooling for ages, they undergo an inconceivable degree of heat. They are subjected to strange vicissitudes from these alternate extremes of heat and cold, as well as from the inequalities of their motions, which are sometimes prodigiously accelerated, and at other times almost infinitely retarded. When compared with the planets, the comets may be considered

considered as worlds in disorder ; for the orbits of the planets are more regular, and their movements more equal ; their temperature is always the same ; they seem to be places of repose, where, every thing being permanent, Nature is enabled to establish a uniform plan of operation, and to mature successively all her various productions. Among the planets, that which we inhabit seems to enjoy peculiar privileges. Less cold and less distant than Saturn, Jupiter, and Mars, it is also not so much scorched as Venus and Mercury, who appear to be too near the body of the sun. Besides, with what magnificence does Nature shine upon the earth ? A pure light, which gradually stretches from east to west, alternately gilds both hemispheres of this globe. It is surrounded with a light and transparent element. A mild and fertile heat animates and unfolds all the germs of existence ; and they are nourished and supported by wholesome waters. Various eminences, distributed over the surface of the land, stop and collect the moist vapours which float in the air, and give rise to perpetual fountains. Immense cavities, destined for the reception of these waters, separate islands and continents. The extent of the sea is as great as that of the land. This is not a cold and barren element. It is a new empire equally rich, and equally peopled with the former. The limits of the waters are marked out by the finger of God. If the sea encroaches on
the

the western shores, it deserts those of the east. This vast mass of water, though naturally inactive, is agitated by the influence of the celestial bodies, which produces the regular motions of the flux and reflux. It rises and falls with the course of the moon; and, when the action of the sun and moon concurs, it rises still higher. Both these causes uniting during the time of the equinoxes, is the reason why the tides are then highest. This is the strongest mark of our connection with the heavens. These constant and general movements give rise to variable and particular motions; to transportations of earth, which, falling to the bottom in the form of sediment, produce mountains similar to those on the surface of the land; to currents, which, following the direction of those chains of mountains, bestow on them a figure whose angles correspond, and, running in the midst of the waves, as waters run on the land, are really sea-rivers.

The air, still lighter and more fluid than water, is likewise subject to a number of powers. Continual agitations are produced in it by the distant influence of the sun and moon, by the immediate action of the sea, and by the rarefaction and condensation of heat and cold. The winds are its currents. They push and collect the clouds. They produce meteors, and transport to the arid surface of islands and continents the moist vapours of the ocean. They give rise to storms, and diffuse and distribute
the

the fertile dew and rains. They disturb the movements of the sea, agitate the waters, stop or precipitate the currents, elevate the waves, and raise tremendous tempests: The troubled ocean rises toward the heavens, and rolls on with noise and violence against those immovable barriers, which, with all its efforts, it can neither destroy nor surmount.

The earth, elevated above the level of the ocean, is defended against its irruptions. Its surface, enamelled with flowers, adorned with a verdure which is always renewing, and peopled with numberless species of animals, is a place of perfect repose, a delightful habitation, where man, destined to aid the intentions of Nature, presides over every other being. He alone is capable of knowledge, and dignified with the faculty of admiration: God, therefore, has made him the spectator of the universe, and the witness of his perpetual miracles. The ray of divinity with which he is animated, makes him participate the mysteries of the Deity. It is by this light that he thinks and reflects, that he perceives and understands the wonderful operations of his Creator.

Nature is the external throne of the divine magnificence. Man who contemplates her, rises gradually to the internal throne of the Almighty. Formed to adore his Creator, he has dominion over every creature. The vassal of heaven, the lord of the earth, he peoples, ennobles, and enriches this lower world. Among living be-

ings, he establishes order, subordination, and harmony. To Nature herself he even gives embellishment, cultivation, extension, and polish. He cuts down the thistle and the bramble, and he multiplies the vine and the rose. View those melancholy deserts where man has never resided. Over-run with briars, thorns, and trees which are deformed, broken, corrupted, the seeds that ought to renew and embellish the scene are choaked and buried in the midst of rubbish and sterility. Nature, who, in other situations, assumes the splendour of youth, has here the appearance of old age and decrepitude. The earth, surcharged with the spoils of its productions, instead of a beautiful verdure, presents nothing but a disordered mass of gross herbage, and of trees loaded with parasitical plants, as lichens, agarics, and other impure fruits of corruption: All the low grounds are occupied with putrid and stagnating waters; the miry lands, which are neither solid nor fluid, are impassable, and remain equally useless to the inhabitants of the earth and of the waters; and the marshes, which are covered with stinking aquatic plants, serve only to nourish venomous insects, and to harbour impure animals. Between those putrid marshes which occupy the low grounds, and the decayed forests which cover the elevated parts of the country, there is a species of lands, or savanna's, that have no resemblance to our meadows. There noxious herbs rise and choak the useful
 kinds,

kinds. Instead of that fine enamelled turf, which appears to be the down of the earth, we see nothing but rude vegetables, hard prickly plants, so interlaced together, that they seem to have less hold of the earth than of each other, and which, by successively drying and shooting, form a coarse mat of several feet in thickness. There is no road, no communication, no vestige of intelligence, in these savage and desolate regions. Man, reduced to the necessity of following the tracks of wild beasts, when he wants to kill them, obliged to watch perpetually lest he should fall a victim to their rage, terrified by their occasional roarings, and even struck with the awful silence of those profound solitudes, he shrinks back and says: ‘ Uncultivated Nature is hideous and languishing. It is I alone who can render her agreeable and vivacious. Let us drain these marshes; let us animate these waters by converting them into brooks and canals; let us employ this active and devouring element, whose nature was formerly concealed from us; let us set fire to this cumbersome load of vegetables, and to those superannuated forests, which are already half consumed; let us finish the work by destroying with iron what could not be dissipated by fire. Instead of rushes, and water-lilies, from which the toad is said to extract his poison, we shall soon see the ranunculus, the truffle, and other mild and salutary herbs; flocks of sprightly cattle will browse upon this land, which

‘ which was formerly impaffable ; here they will
 ‘ find abundance of food, a never failing paffure,
 ‘ and they will continue to multiply, and to re-
 ‘ ward us for our labours, and the protection
 ‘ we have afforded them. To complete the
 ‘ work, let the ox be fubjected to the yoke ;
 ‘ let his ftrength and the weight of his body
 ‘ be employed in ploughing the ground, which
 ‘ acquires fresh vigour by culture. Thus will
 ‘ Nature acquire redoubled ftrength and splen-
 ‘ dour from the fkill and induftry of man.’

How beautiful is cultivated Nature ! how pompous and brilliant, when decorated by the hand of man ! He himfelf is her chief ornament, her nobleft production. By multiplying his own fpecies, he increafes the moft precious of her works. She even feems to multiply in the fame proportion with him ; for, by his art, he brings to light every thing which fhe concealed in her bofom. What a fource of unknown treafures ! Flowers, fruits, and grains matured to perfection, and multiplied to infinity ; the ufeful fpecies of animals transported, propagated, and increafed without number ; the noxious kinds diminifhed, and banifhed from the abodes of men ; gold, and iron a more ufeful metal, extracted from the bowels of the earth ; torrents reftained, and rivers directed and confined within their banks ; even the ocean itfelf fubdued, inveftigated, and traversed from the one hemisphere to the other ; the earth every
 where

where accessible, and rendered active and fertile; the vallies and plains converted into smiling meadows, rich pastures, and cultivated fields; the hills loaded with vines and fruits, and their summits crowned with useful trees; the deserts turned into populous cities, whose inhabitants spread from its centre to its utmost extremities; open and frequented roads and communications every where established, as so many evidences of the union and strength of society. A thousand other monuments of power and of glory sufficiently demonstrate that man is the lord of the earth; that he has entirely changed and renewed its surface; and that, from the remotest periods of time, he alone has divided the empire of the world between him and Nature.

He reigns, however, by the right of conquest only. He enjoys rather than possesses; and preserves his privileges by perpetual vigilance and activity. If these are interrupted, every thing languishes, alters, and returns to the absolute dominion of Nature. She resumes her rights, effaces the operations of man, covers with moss and dust his most pompous monuments, which, in the progress of time, she totally destroys, and leaves him only the regret of having lost by his own fault, what his ancestors had acquired by their industry. Those periods, when man loses his empire, those barbarous ages in which every thing of value perishes, commence with war, and are completed by famine and depopulation. Man, whose strength consists solely in the
 union

union of numbers, and whose happiness is derived from peace, is yet mad enough to take up arms, and to fight, which are never failing sources of misery and ruin. Incited by insatiable avarice, and by blind ambition, which is still more insatiable, he renounces the feelings of humanity, turns all his strength against himself, and his whole desires centre in the destruction of his own species, which he soon accomplishes. After these days of blood and carnage, when the intoxicating fumes of glory are dispelled, he surveys, with a melancholy eye, the earth desolated, the arts buried, nations dispersed, an enfeebled people, the ruin of his own happiness, and the annihilation of his real power.

*Omnipotent GOD ! whose presence supports Nature, and maintains harmony among the laws of the universe ; who, from thy immoveable throne in the Empirean, seest all the celestial spheres rolling under thy feet, without deviation or disorder ; who, from the bosom of repose, renewest, at every instant, their vast movements, and who alone governest, in profound peace, an infinite number of heavens and of earths ! restore, restore tranquillity to a troubled world * ! Let the earth be silent ! Let the presumptuous tumults of war and discord be dispelled by the sound of thy voice ! Merciful GOD, Author of all beings, thy paternal regards embrace every created object : But man is thy chief favourite.*

* This effusion was probably written before the termination of the last war between Britain and France.

ourite. Thou hast illuminated his mind with a ray of thy immortal light ; penetrate also his heart with a shaft of thy love : This divine sentiment, when universally diffused, will unite the most hostile spirits ; man will no longer dread the aspect of man, and his hand will cease to be armed with murdering steel ; the devouring flames of war will no more dry up the sources of generations ; the human species, now weakened, mutilated, and prematurely mowed down, will germinate afresh, and multiply without number : Nature, groaning under the pressure of calamity, sterile, and abandoned, will soon resume, with accumulated vigour, her former fecundity ; and we, beneficent GOD, we shall aid, cultivate, and incessantly contemplate her operations, that we may be enabled to offer thee, every moment, a fresh tribute of gratitude and admiration.

T H E

T H E Z E B R A *.

WHETHER we consider symmetry of shape, or beauty of colours, the zebra is perhaps the most elegant of all quadrupeds. In this animal, the figure and gracefulness of the horse are united with the nimbleness of the stag. His robe is adorned with black and white belts or ribbons, alternately disposed, with such regularity and exact proportion, that Nature seems here to have employed the rule and the compass. These alternate bands of black and white are the more singular, because they are straight, parallel, and as nicely separated as those of a striped stuff. Besides, they extend not only over the body, but the head, thighs, legs, and even the ears

* The Zebra has a short erect mane ; the tail is furnished with long hairs at the end ; and the whole body is beautifully striped, from the back to the belly, with lines of brown, on a very pale buff ground. It is the most elegant of all quadrupeds ; *Pennant's Synops. of quad. p. 2.*

It is called *Zebra*, *Zevera*, and *Sebra*, in Congo ; and, according to *Pyrard*, *Esve* in Angola.

Pulcher onager ; *Martial. Epig. lib. xii. 101. Oppian. Cynege. iii. 183.*

Zebra ; *Nieremberg, p. 168. Raii Synops. quad. p. 64. Klein. quad. p. 5. Aldrovand. de quad. solid. p. 416.*

Le Zebre, ou l'âne rayé ; Brisson. quad. p. 70.

Equus zebra, fasciis fuscis varicolor ; Linn. Syst. Nat. p. 101.

Wild ass ; Kolben's Cape of Good Hope, vol. 2. p. 112,

natures of the two animals ; for the zebra was four years of age, and, in every other exercise, was sprightly and vigorous.

The zebra is not the animal mentioned by the antients under the name of *onager*. In the Levant, in the eastern parts of Asia, and in the north of Africa, there is a fine race of asses, which, like the most beautiful horses, originated in Arabia *. This race differs from the common kind by the largeness of its body, the nimbleness of its limbs, and the lustre of its hair. They are of one uniform colour, which is a beautiful mouse gray, with a black cross on the back and shoulders. Sometimes their colour is a brighter gray, with a whitish cross †. These African and Asiatic asses ‡, though more beautiful

* In Persia there are two kinds of asses ; those belonging to the country, which, like ours, are slow and stupid, and used for carrying burdens only ; and the Arabian asses, which are extremely handsome, and the most excellent of the species. They have smooth hair, a high head, and nimble limbs. They are used solely for riding. . . . Like horses, they are trained to amble ; and their motion is extremely soft, and so fleet, that it requires a gallop to keep up with them ; *Voyage de Chardin, tom. 2. p. 27. Voyage de Tavernier, tom. 2. p. 20.*

† At Bassora, I saw a wild ass. Its figure differed not from that of the domestic kind ; but its colour was brighter, and, from the head to the tail, there was a band of whitish hair. . . . In running, and in every other motion, it seemed to be much more nimble than the common kind ; *Voyage de Pietra della Valle, tom. 8. p. 49.*

‡ The Moors, who come to Cape-Verd to traffick, carry their baggage and wares upon asses. These animals were so beautiful and so smooth skinned, that it was with difficulty I could

tiful than those of Europe, proceed equally from the *onagri* or *wild asses*, which are still numerous in South and East Tartary *, in Persia, Syria, the islands of the Archipelago, and in Mauritania †. The onagers differ from the domestic asses by those qualities only which result from freedom and independence: They are stronger and more nimble, and they have more courage and vivacity. The figure of their bodies is

could recognise them to be asses. Those of Europe, I imagine, would be in the same condition, if their labour and the manner in which they are loaded did not greatly disfigure them. Their hair was of a beautiful, shining, mouse gray colour, upon which the black band along the back, and across the shoulders, had a fine effect. These asses are a little larger than ours. Their head, however, is easily distinguishable from that of the horse, especially the Barbary horse, which is a native of this country, and of a still higher stature; *Voyage au Senegal, par M. Adanson, p. 118.*—There are great numbers of wild asses in the deserts of Numidia and Lybia, and the adjacent country. They are so fleet, that the Barbary horses alone are able to overtake them in the course. As soon as they see a man, they stop, fling up their heels, and cry; and, when he is near, they run off. They are taken by various kinds of snares. They go in troops to pasture and to drink. Their flesh is very good; but it must be allowed to cool two days after being roasted, on account of its strong smell. We have seen a number of these animals in Sardinia; but they were smaller; *L'Afrique de Marmol, tom. 1. p. 53.*

* The animal which the Mogul Tartars call *Czigithai*, and which Messerschmid has denominated *mulus foecundus Dauricus*, is the same with the *onager* or *wild ass*.

† We find many wild asses in the islands of Peine, and of Levata or Lebinthos. . . . They are also found in the island of Cythera, now called *Cerigo*; *Descript. des isles de l'Archipel, par Dapper, p. 185. 378.*

is the same, though their hair is longer. This difference depends likewise on their condition; for our asses would have hair equally long, if they were not shorn at the age of four or five months. The hair of a colt is at first nearly as long as that of a young bear. The skin of the wild ass is equally hard as that of the domestic kind, and we are assured that it is full of small tubercles. The chagrin brought from the Levant, which we employ for various purposes, is said to be made of the wild ass's skin.

But, neither the onager, nor the fine asses of Arabia, can be regarded as the origin of the zebra species, though they resemble it in figure and swiftness. None of them exhibit that regular variety of colours, by which the zebra is so eminently distinguished. This beautiful species is singular, and very remote from all other kinds. It likewise belongs to a different climate from that of the onager, being only found in the eastern and southern regions of Africa, from Æthiopia to the Cape of Good Hope *, and from thence

* At the Cape of Good Hope there are numbers of wild asses, which are the most beautiful in the world. They are finely striped with black and white bands, and are very difficult to tame; *Relation du Chevalier de Chaumont*, p. 12.—The wild ass of the Cape is one of the most beautiful animals I have ever seen. He is of the size of an ordinary saddle horse. His limbs are slender and well proportioned, and his hair is soft and close. From the mane to the tail, a black band runs along the back, from which numbers of other bands of *different colours* proceed, and form circles by meeting under the belly.

thence as far as Congo *. He exists not in Europe, Asia, America, nor in any of the northern parts of Africa. Those mentioned by some voyagers

belly. Some of these circles are white, others yellow, and others chestnut; and their various shades run into each other in such a manner as charms the eye of the spectator. His head and ears are also adorned with small bands of the same colours. Those on the mane and tail are mostly white, chestnut, or brown, and few of them yellow. He is so fleet that no horse in the world can be compared to him. Hence it is extremely difficult to catch one, and, when caught, he sells very dear. . . . I have often seen large troops of these animals. Father Tellez, Thevenot, and other authors assert, that they have seen them tamed; but I never heard of their being tamed at the Cape. Several Europeans have ineffectually exerted all their skill and industry to accomplish this end; *Descript. du Cap de Bonne-Esperance, par Kolbe, tom. 3. p. 25.*

* At Pamba, in the kingdom of Congo, we find an animal called *zebra* by the natives, which exactly resembles a mule, excepting that it is prolific. Besides, its hair is wonderfully disposed; for, from the spine of the back to the belly, there are bands of white, black, and yellow, about three inches broad, and arranged with the nicest proportion. These animals multiply greatly in this country; for they produce every year. They are extremely fleet and wild. If tamed, they might supply the place of the horse; *Drake's voyage, p. 106.*—On the road to Loanda in the kingdom of Congo, there is an animal of the size and strength of a mule; but its hair is variegated with white, black, and yellow bands, which encircle the body from the spine of the back to the belly, and are so beautiful, and so regularly disposed, that they have the appearance of being drawn by a pencil. It is named *zebra*; *Relat. d'un voyage de Congo, par les P. P. Michel-Ange de Galline et Denys de Charly, Capucins, p. 76.*—In Congo, there is an animal called *sebra*, which every way resembles a mule, excepting in its power of producing. Its hair is very singular: From the ridge of the back to the belly, there are three bands

agers * to have been found in Brasil, had been transported thither from Africa. Others, which have been seen in Persia †, and in Turkey ‡, had been

of different colours, &c.; *Voyage de la Compagnie des Indes de Hollande, tom. 4. p. 320.*

* When I arrived in Brasil, I saw two very rare animals, which were of the figure and size of a small mule; yet they are not mules; for they are fertile. The skin is extremely beautiful, very smooth, short, and shining like velvet. The hair is disposed into fine white and black bands, which run in the most exact proportion over the whole body, ears, tail, and other extremities. Moreover, these animals are very fierce, and never can be fully tamed. They are called, in the country from which they were brought, *Esfures*. They are natives of Angola in Africa, from whence they were transported to Brasil, in order to be afterwards presented to the King of Spain. Though they had been taken when very young, and were a little tamed, no body durst approach them, except their keeper. Some time before I arrived, one of them had broke loose, and killed a groom. . . . Thought up very close, the keeper showed me several bites he had received from them. The skin of the animal is extremely beautiful; *Voyage de Pyrrard, tom. 2. p. 376.*

† The ambassadors from Æthiopia to the Mogul, must give a present of a kind of mule, whose skin I was shown as a great rarity. No tiger is so finely marked, no silken stuff is striped with such variety, order, and proportion, as the skin of this animal; *Hist. de la revolution du Mogol, par Fr. Bernier, tom. 1. p. 181.*

‡ An ambassador from Æthiopia arrived at Cairo with presents for the Grand Seignior. Among others, there was an ass that had a most beautiful skin, provided it was natural, of which I am uncertain, as I did not examine it. It had a black line along the back, and all the rest of the body was variegated with alternate bands of white and tawny. The head was very long, and striped in the same manner with the body. The ears were black, yellow, and white. The legs were striped like the body, not lengthwise, but round in the manner

been brought to these countries from Æthiopia. In fine, almost all those we have seen in Europe came from the Cape of Good Hope. This point of Africa is their native climate, where they are very numerous, and where the Dutch have exerted every effort to tame and render them domestic; but they have not hitherto been able fully to accomplish this purpose. The zebra, which was the subject of our description, was extremely wild when he arrived at the royal menagerie, and is not yet entirely tamed. They have, however, brought him the length of being mounted; but it requires great precaution. Two men hold the bridle, while a third sits on the animal's back. His mouth is extremely hard: His ears are so sensible, that he flings whenever they are touched, and, like a vicious horse, he is restless, and as stubborn as a mule. But the wild horse and the onager are perhaps equally untractable; and it is extremely probable, that, if the zebra were early accustomed to obedience, and to a domestic state, he would become equally gentle with the ass and horse, and might supply the place of both.

SUPPLEMENT.

manner of garters. The whole of these stripes or bands were disposed with such symmetry, that no tiger or leopard's skin could equal the beauty of this animal's skin. Two similar asses, belonging to the same ambassador, died on the road, and he was carrying their skins, together with the animal that survived, as a present to the Grand Seignior; *Relat. d'un voyage, par Thevenot, tom. 1. p. 473.*

S U P P L E M E N T.

The afs, either in a domestic or wild state, is found in almost every warm and temperate climate of the Old Continent, and existed not in the New when it was first discovered. But the species, after being transported thither from Europe, has now subsisted and multiplied greatly in America, during more than two centuries; so that, at present, it is almost equally diffused over the four quarters of the globe. The zebra, on the contrary, which was brought to us from the Cape of Good Hope, seems to be a species limited to the southern regions of Africa; though Lopez asserts, that the zebras are more frequent in Barbary than in Congo, and though Dapper relates, that troops of them are found in the forests of Angola.

This beautiful animal, which, both from the variety of its colours and the elegance of its figure, is so superior to the afs, seems, notwithstanding, to be nearly of the same species; since most travellers give it the name of the *striped afs*, because, at first sight, they were struck with its superior resemblance, both in size and figure, to the afs than to the horse; for it was not with the small common asses that they compared the zebra, but with the largest and most beautiful of
the

the species. I am still inclined to think, however, that the zebra approaches nearer to the horse than the afs; for his figure is so elegant, that though, in general, he is less than the horse, the similarities between them, in other respects, are very apparent. To confirm this opinion, it has been remarked, with some degree of surprise, that, in the neighbourhood of the Cape of Good Hope, which appears to be the native country of the true zebra, there are horses spotted on the back and belly with yellow, black, red, and azure *. This particular argument is supported by the general fact, that, in all climates, the colour of the horse varies more than that of the afs. We pretend not to decide this question; but we hope that it will soon be determined. As the Dutch have lately transported great numbers of these elegant animals, and have even yoked them in the Stadtholder's chariot, it is probable that, in a short time, we shall receive information of every thing relating to their nature. That industrious nation cannot fail to make these animals unite among themselves, and perhaps with horses and asses, in order to produce direct or bastard races. In Holland, there are several expert naturalists who will perhaps succeed better than we did in the multiplication of the zebra, upon which only a single experiment was made at the royal menagerie in the year 1761. The male, which was four years of age, disdain-

* Captain Robert's voyage, tom. 1. p. 94.

ed the she-afles, though in feafon, and no more were prefented to him. Perhaps he was alfo too young. Befides, he was not rendered familiar with the females, a neceffary preliminary for fucceeding in the union of different fpecies, which Nature feems to require even in the intercourfe of individuals of the fame fpecies.

The fertile mule of Tartary, called *czigithai*, may perhaps be an animal of the fame fpecies with the zebra; for there feems to be no difference between them, but in colour. Now, it is well known, that the differences in the colour of the hair or feathers are extremely flight, and depend on the influence of the climate. The *czigithai* is found in the fouthern parts of Siberia, in Thibet, in Dauria, and in Tartary. Gerbillon remarks, that thefe animals are common in the country of the Mongoux and Kakas; that they differ from domeftic mules; and that they cannot be trained to bear burdens*. Muller and Gmelin affure us, that they are numerous in the country of the Tongufians, where they are hunted like other game; that, in Siberia, toward Borsja, they are very plenty in dry years; and he adds, that they refemble, in figure, fize, and colour, a bright bay horfe, except that they have very long ears †, and a tail like that of a cow. If thefe travellers who examined

* *Hift. gen. des Voyages*, tom. 6. p. 601.

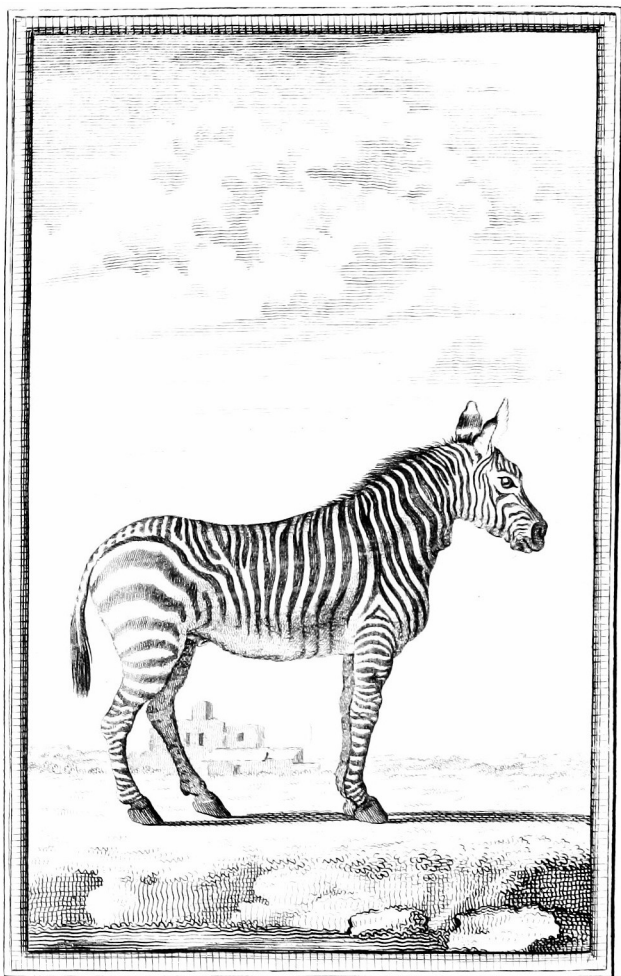
† *Voyage de M. Muller et Gmelin*, tom. 2. p. 105. 107.

amined the czigithai had, at the same time, compared it with the zebra, they would perhaps have discovered a greater number of relations than we are apt to imagine. In the Petersburg cabinet there are stuffed skins both of the zebra and czigithai. Though these skins differ in colour, they may belong to the same, or a very neighbouring species. Time alone can remove or confirm these conjectures. But, as all the other animals of Africa are likewise found in Asia, if the zebra and czigithai are not of the same species, the zebra alone would be an exception to this general rule.

Besides, if the czigithai is not the same with the zebra, it may be the Asiatic animal called *onager* or *wild ass*. The onager should not be confounded with the zebra; but I am uncertain whether the same remark is applicable to the onager and czigithai; for, from comparing the relations of travellers, it appears, that there are different kinds of wild asses, of which the onager is the most remarkable. Perhaps the horse, the ass, the onager, and the czigithai, constitute four distinct species: And, on the supposition that they are only three, it is still uncertain whether the czigithai be an onager or a zebra. The swiftness of the onager is mentioned by travellers, who remark, that he runs with such rapidity as to escape the hunters, though mounted on horses; and they say the same thing of the czigithai. However this
matter

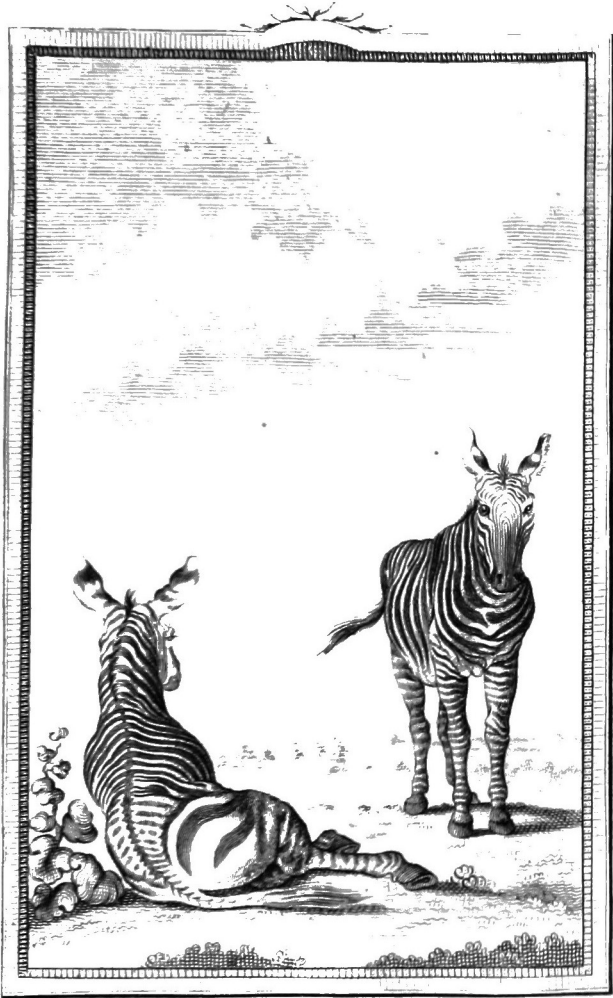
matter stands, the horse, the afs, the zebra, and the czigithai, belong to the same genus, and constitute three or four branches of the same family : The two first of which have long been reduced to a domestic state ; which gives us reason to hope, that the two last may likewise be tamed, and prove a useful acquisition to mankind.

The



A. Bell Sculp.

ZEBRA.



A. Miller sculp.

ZEBRA.

The HIPPOPOTAMUS*.

THOUGH the hippopotamus has been celebrated from the remotest antiquity; though the sacred writings mention him under the name of *Bebemoth*; and though his figure is engraved

* The hippopotame has four cutting teeth in each jaw. Those in the middle are straight and pointed forward, the two middlemost the largest. It has four tusks, those in the upper jaw are short, in the lower very long, and truncated obliquely. The head is of an enormous size, and the mouth is vastly wide. The ears are small and pointed, and lined within very thickly with short fine hairs. The eyes and nostrils are small in proportion to the bulk of the animal. On the lips are some strong hairs scattered in patches here and there. The hair on the body is very thin, of a whitish colour, and scarce discernible at first sight. There is no mane on the neck, as some writers feign, only the hairs on that part are rather thicker. The skin is very thick and strong, and of a dusky colour. The tail is about a foot long, taper, compressed, and naked. The hoofs are divided into four parts; but, notwithstanding it is an amphibious animal, they are not connected by membranes. The legs are short and thick. In bulk, it is second only to the elephant. The length of a male has been found to be seventeen feet, the circumference of the body fifteen, the height near seven, the legs near three, the head above three and a half, and the girth near nine; *Pennant's synopsis of quad. p. 78.*

In Hebrew, *Bebemoth*; *Shaw's travels, suppl. p. 87.* *Bochart*; in Greek, ἵπποποταμός; *Arist. hist. anim. lib. 2. c. 7.*; in Latin, *Hippopotamus*; in Italian, *Hippopotamo*; in the Egyptian language, according to *Zerenghi*, *Foras'bar*, which signifies *sea-horse*.

Hippopotamus;

ved on the Egyptian obelisks, and on the Roman medals; yet he was very imperfectly known to the ancients. Aristotle * speaks of this animal
in

Hippopotamus; *Belon. obs. de la nature de poissons*, p. 17. *Gesner. quad.* p. 493. *Radzivil iter Hierosol.* p. 142. *Raii Synopf. quad.* p. 123. *Fab. Columna, aquat.* p. 28. *Aldrov. de quad. digit. vivip.* p. 181.

River horse; *Grew's museum*, p. 14. tab. 1. *Ludolph Æthiop.* p. 60.

Cheropotamus et hippopotamus; *Prosp. Alp. Egypt. hist. nat. lib. 4.* p. 246. tab. 23.

Sea ox; *Lobo Abyssin.* p. 105. *Kolben's Cape*, vol. 2. p. 129.

Sea horse; *Leo Afric.* p. 344. *Dampier's voy.* vol. 2. p. 104. *Adanson's voy.* p. 133. *Moore's voy. to Gambia*, p. 105. 188. 216.

River paard; *Houttuyn Nat. hist.* vol. 3. p. 405. tab. 28.

Water elephant; *Barbot, voy. to Guinea*, p. 113. 173.

Hippopotamus amphibius, pedibus quadrilobis; *Linn. syst. nat.* p. 101. *Hasselquist. iter*, p. 201. *Klein. quad.* p. 34. *Brisson. quad.* p. 83.

Hippopotamo; *La vera descriptione dell hippopotamo, auctore Federico Zerenghi da Narni, medico chirurgico in Napoli*, 1603. p. 67. *Note.* This description of the hippopotamus makes a part of an abridgement of surgery, composed by the same author, on the 65th page of which is the particular title above quoted. This small work, which is both original and excellent, is at the same time so rare, as not to be mentioned by any naturalists. The figure was drawn from a female hippopotamus.

* Equo fluviatili, quem gignit Egyptus, juba equi, ungula qualis bubus, rostrum refimum. Talus etiam inest Bifulcorum modo; dentes exerti sed leviter; cauda apri, vox equi, magnitudo asini, tergoris crassitudo tanta ut ex eo venabula faciant, interiora omnia equi et asini similia; *Arist. Hist. avim. lib. 2. cap. 7.*———Natura etiam equi fluviatilis ita constat, ut vivere nisi in humore non possit; *Idem. lib. 8. cap. 24. Note.* The hippopotamus has no mane, like the horse; and his hoofs are not divided into two, but into four. His tusks appear

in the most superficial manner; and, in the little he says, there are more errors than truth. Pliny * copies Aristotle, and, instead of correcting, adds to the number of his blunders. It was not till about the middle of the sixteenth century that any precise information was obtained concerning this animal. Belon, being then at Constantinople, saw a living hippopotamus, of which, however, he gives but an imperfect representation; for the two figures which he has added to his description were not drawn from the animal he saw, but were copied from the reverse of Adrian's medal, and from the Egyptian colossus at Rome. Hence the era of any exact knowledge concerning this animal must be brought forward to the year 1603, when Federico Zerenghi, a surgeon of Narni in Italy, printed at Naples the history of two hippopotami which he had taken alive in a great ditch dug on purpose in the neighbourhood of the Nile, near Damietta. This little book was written in Italian; and, though it be the only

appear not on the outside of the mouth. His tail is very different from that of the wild boar; and he is at least six times larger than the ass. Like other quadrupeds, he can live on land; for the one described by Belon had lived two or three days without entering the water. Hence Aristotle must have had very bad information concerning this animal.

* Pliny says, that the hippopotamus inhabits the sea as well as the rivers, and that he is covered with hair like the sea-calf. *Note.* This last fact is advanced without any foundation; for it is certain that he has no hair on his skin, and that he was never seen nearer the sea than the mouths of rivers.

ly thing original we have upon this subject, it seems to have been totally neglected both by contemporary and succeeding naturalists. The description it contains of the hippopotamus is, at the same time, so good, and appears so worthy of credit, that I shall here give an extract and translation of it.

‘ With a view,’ says Zerenghi, ‘ of obtaining
 ‘ an hippopotamus, I stationed men upon the
 ‘ Nile, who, having seen two of these animals go
 ‘ out of the river, made a large ditch in the way
 ‘ through which they passed, and covered it with
 ‘ thin planks, earth, and herbage. In the even-
 ‘ ing, when returning to the river, they both fell
 ‘ into the ditch. I was immediately informed
 ‘ of the event, and hastened to the place along
 ‘ with my Janissary. We killed both the ani-
 ‘ mals by pouring three shot into each of their
 ‘ heads from a large arquebuse. They almost
 ‘ instantly expired, after uttering a cry which
 ‘ had more resemblance to the bellowing of
 ‘ a buffalo, than to the neighing of a horse.
 ‘ This exploit was performed on the 20th day
 ‘ of July 1600. The following day, they were
 ‘ drawn out of the ditch, and carefully skinned.
 ‘ The one was a male, and the other a female.
 ‘ I caused their skins to be salted, and stuffed
 ‘ with the leaves of the sugar cane, in order to
 ‘ transport them to Cairo, where they were
 ‘ salted a second time with more attention and
 ‘ convenience. Each skin required four hun-
 ‘ dred pounds of salt. On my return from E-
 ‘ gypt,

‘gypt, in 1601, I brought these skins to Venice,
 ‘ and from thence to Rome. I showed them
 ‘ to several intelligent physicians. Doctor
 ‘ Jerome Aquapendente and the celebrated Aldrovandus were the only persons who recognised them to be the spoils of the hippopotamus; and, as Aldrovandus’s work was then printing, I allowed him to draw a figure from the skin of the female, which he inserted in his book.

‘ The skin of the hippopotamus is very thick,
 ‘ and very hard; it is even impenetrable, unless after being long steeped in water. The mouth is not, as the antients alledge, of a middle size, but enormously large. Neither are his feet divided into two toes, but into four. His size is not that of an ass; for he is much larger than the largest horse or buffalo. His tail resembles not that of a hog, but rather that of the tortoise, only it is incomparably larger. His muzzle is not turned up, but resembles that of the buffalo, and is much larger. He has no mane, but only a few short, scattered hairs. He neighs not like a horse; but his voice is a medium between the bellowing of a buffalo and the neighing of a horse. He has no tusks which protrude out of the mouth; for, when the mouth is shut, the teeth, though extremely large, are all concealed within the lips. . . . The inhabitants of this part of Egypt call him *foras l’bar*, which signifies the *sea horse*. . . . Be-

‘ lon’s description is very erroneous : He gives
 ‘ to this animal the teeth of the horse, which
 ‘ would lead us to think, contrary to his own
 ‘ assertions, that he had never seen it ; for the
 ‘ teeth of the hippopotamus are very large and
 ‘ very singular. . . . To remove every uncer-
 ‘ tainty,’ continues Zerenghi, ‘ I here give the
 ‘ figure of the female hippopotamus with all the
 ‘ dimensions and proportions of the body and
 ‘ members, drawn exactly according to nature.

‘ The length of this hippopotamus, from the
 ‘ extremity of the upper lip to the origin of the
 ‘ tail, is nearly eleven feet two inches *.

‘ The circumference of the body is about ten
 ‘ feet.

‘ The height, from the sole of the foot to the
 ‘ top of the back, is four feet five inches.

‘ The circumference of the legs, near the
 ‘ shoulders, is two feet nine inches, and, when
 ‘ taken lower, one foot nine inches and a half.

‘ The height of the legs, from the sole of the
 ‘ foot to the breast, is one foot ten inches and a
 ‘ half.

‘ The length of the feet, from the extremity
 ‘ of the nails, is about four inches and a half.’

Nota. I have here taken a mean between Ze-
 renghi’s two measures for the length of the feet.

‘ The nails, or divisions of the hoof, are as
 ‘ long as they are broad, being two inches and
 ‘ two lines.

‘ Each

* This and the following measures are all Paris feet and inches.

‘ Each toe has a nail, and each foot four toes.

‘ The skin, on the back, is near an inch, and that on the belly about seven lines thick.

‘ The skin, when dried, is so hard that a musket ball cannot pierce it. The country people make large shields of it, and likewise use it for thongs or whips. On the surface of the skin there are a few scattered whitish hairs, which are not perceptible at first sight. On the neck the hairs are longer, and all of them placed one by one, at greater or smaller distances from each other. But, on the lips, they form a kind of whiskers; for, in several places, ten or twelve of them issue from the same point. These hairs are of the same colour as the others, only they are harder, thicker, and somewhat longer, though none of them exceeds half an inch in length.

‘ The length of the tail is eleven inches four lines: Its circumference, at the origin, is a little more than a foot, and, at the extremity, two inches ten lines.

‘ The tail is not round; but, from the middle to the point, it is flattened, like that of an eel. Upon the tail and the thighs there are some round scales, of a whitish colour, and as large as lentils. These small scales likewise appear on the breast, the neck, and some parts of the head.

‘ From the extremity of the lips to the beginning of the neck, the head is four feet four inches,

‘ The

‘ The circumference of the head is about five feet eight inches.

‘ The ears are two inches nine lines long, two inches three lines broad, a little pointed, and garnished in the inside with fine, short, thick hairs, of the same colour as the others.

‘ The eyes, from one corner to the other, are two inches three lines; and the eye-lids are distant from each other one inch one line.

‘ The nostrils are two inches four lines long, and one inch three lines broad.

‘ The mouth opens to the width of one foot five inches four lines. It is of a square form, and furnished with forty-four teeth of different figures*. All these teeth are so hard, that they strike fire with steel. It is chiefly the enamel of the canine teeth which possesses this degree of hardness, the internal substance of the whole being softer. . . . When the hippopotamus keeps his mouth shut, no teeth appear without, but are all covered with the lips, which are extremely large.

‘ With regard to the figure of the hippopotamus, it appears to be a medium between those of the buffalo and hog, because it participates of both, except the cutting teeth, which

* In three heads of the hippopotamus, preserved in the royal cabinet, there are only thirty-six teeth. As these heads are smaller than that described by Zerenghi, it may be presumed that, in young hippopotami, all the grinders are not developed, and that adults have eight more.

‘ which have no resemblance to those of either
 ‘ of these animals. The grinding teeth have
 ‘ some similarity to those of the buffalo or horse,
 ‘ though they are much longer. The colour
 ‘ of the body is dusky and blackish. We
 ‘ are assured that the hippopotamus produces
 ‘ but one at a time ; that he lives upon fishes,
 ‘ crocodiles, and even cadaverous flesh. He
 ‘ eats, however, rice, grain, &c. though, if we
 ‘ consider the structure of his teeth, it would
 ‘ appear that Nature had not destined him for
 ‘ pasture, but for devouring other animals.’

Zerenghi finishes his description by informing us, that all these measures had been taken from the female subject, and that the male perfectly resembled her, except that, in all his dimensions, he was one third larger. It were to be wished that the figure given by Zerenghi had been equally good as his description : This animal, however, was not drawn from the life, but from the skin of the female. It likewise appears, that Fabius Columna took his figure from the same skin, which was preserved in salt. But Columna’s description is not equal to that of Zerenghi ; and he even merits reproach for mentioning only the name, and not the work, of this author, though it was published three years before his own. For example, Columna remarks, that, in his time, (1603), Federico Zerenghi brought from Egypt to Italy an entire hippopotamus, preserved in salt, though Zerenghi himself tells
 us,

us, that he brought only the skin. Columna makes the body of his hippopotamus thirteen feet long*, and fourteen feet in circumference, and the legs three feet and a half in length; while, by the measures of Zerenghi, the body was only eleven feet two inches long, its circumference ten feet, the legs one foot ten inches and a half, &c. We can have no dependence, therefore, on Columna's description: Neither can he be excused by supposing that his description was taken from another subject; for it is evident, from his own words, that he described the smallest of Zerenghi's two hippopotami, since he acknowledges, that, some months afterward, Zerenghi exhibited a second hippopotamus, which was much larger than the first. I have insisted upon this point, because no body has done justice to Zerenghi, though he merits the highest eulogiums. On the contrary, all naturalists, for these hundred and

* Hippopotami a nobis conspecti ac dimensi corpus a capite ad caudam pedes erat tredecim, corporis latitudo sive diameter pedes quatuor cum dimidio, ejusdem altitudo pedes tres cum dimidio, ut planum potius quam carinosum ventrem habeat: Orbis corporis quantum longitudo erat: Crura e terra ad ventrem pedes tres cum dimidio: Ambitus crurum pedes tres; pes latus pedem; ungulae singulae uncias tres: caput vero latum pedes duo cum dimidio, longum pedes tres; crassum ambitu pedes septem cum dimidio: Oris rictus pedem unum, &c. Perhaps the foot used by Columna was shorter than the Paris foot. But this circumstance will not justify him; for the body of his hippopotamus being thirteen feet long, its circumference ought to have been only eleven feet seven or eight inches, and not fourteen feet. The other proportions are equally erroneous; for they correspond not with those given by Zerenghi.

and sixty years, have ascribed to Fabius Columna what was due to Zerenghi alone; and, instead of inquiring after the work of the latter, they have contented themselves with copying and praising that of Columna, though, with regard to this article, he is neither original, exact, nor even honest.

The description and figures of the hippopotamus, which Prosper Alpinus published more than a hundred years after, are still worse than those of Columna, having been drawn from ill preserved skins; and M. Jussieu *, who wrote upon the hippopotamus in the year 1724, has only described the bones of the head and feet.

By comparing these descriptions, and especially that of Zerenghi, with the information derived from travellers †, it appears that the hippopotamus

* Mem. de l'Acad. des Sciences, ann. 1724. p. 209.

† In the river Nile there are *hippopotami* or *sea horses*. In the year 1658, one of them was taken at Girge. It was soon brought to Cairo, where I saw it in the month of February of the same year; but it was dead. This animal was of a kind of tawny colour. Behind he resembled the buffalo; but his legs were shorter and thicker. He was as tall as a camel. His muzzle resembled that of an ox; but his body was twice as large. His head was similar to that of a horse, but larger. His eyes were small, his neck very thick, his ears small, his nostrils very large and open, his feet very large, almost round, with four toes on each, like those of the crocodile, and his tail small. Like the elephant, he had little or no hair on the skin. In the under jaw, he had four large teeth, about half a foot in length. Two of them were crooked, and as thick as the horns of an ox. At first, he was mistaken for a

sea

potamus is an animal whose body is longer, and as thick as that of the rhinoceros; that his legs are much shorter*; that his head is not so long, but larger in proportion to his body; that he has no horns, either on the nose, like the rhinoceros, or on the head, like the ruminating animals. As the cry he utters when pained is composed, according to antient authors and modern travellers †, of the neighing of a horse and the

sea buffalo. But I, and some others, who had read descriptions of this animal, knew it to be a sea horse. It was brought dead to Cairo by the Janissaries, who shot it on land, where it had come to feed. They poured several shots into it before it fell; for, as I formerly remarked, a musket ball hardly pierces its skin. But one ball entered its jaw, and brought it to the ground. None of these animals had been seen at Cairo for a long time; *Relat. d'un voyage du Levant, par Thevenot, tom. 1. p. 49¹.*

* The legs of the hippopotamus are so short, that the belly of the animal, when he walks, is not more than four inches above the ground; *Belon des poissons, p. 17.*—*Crura e terra ad ventrem pedes tres cum dimidio*; *Fabius Columna, p. 31.* The testimonies of Belon and Columna, with regard to the length of the legs, differ so widely, than none of their dimensions can be adopted. It must be remarked, that the hippopotamus which Belon saw alive, was very young and very fat; that, of course, his belly must have been large and pendulous; that, on the contrary, the skin described by Columna, which was the same with that of Zerenghi, had been dried with salt, and, consequently, Columna could not be certain that the belly of the animal was not round, but flat. Thus the measures of Belon are too short for an adult hippopotamus, and those of Columna too long for a living one. Hence we may infer from both, that, in general, the belly of this animal is not above a foot and a half from the ground; and that, as Zerenghi remarks, its legs exceed not two feet in length.

† *Vocem equinam edit, illius gentis relatione*; *Prosp. Alp. Egypt.*

the bellowing of a buffalo, his ordinary voice may perhaps resemble the neighing of a horse, from which, however, he differs in every other respect. If this be the case, we may presume that the animal has obtained the name *hippopotamus*, which signifies the *river-horse*, solely from the similarity of his voice to that of a horse; in the same manner as the lynx, from his howling like a wolf, obtained the appellation of *lupus cervarius* *. The cutting, and particularly the canine teeth of the lower jaw, are very long, and so hard and strong, that they strike fire with steel †. This circumstance, it is

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probable,

Egypt. Hist. nat. lib. 4. p. 248.—Merolla says, that, in the river Zaira there are river-horses, which neigh like the common horse; *Hist. gen. des voyages, par M. l'Abbé Prevost, tom. 5. p. 95.*—This animal has derived his name from his neighing like a horse; *Recueil des Voyages de la Compagnie des Indes de Hollande, tom. 4 p. 440*—The neigh of the hippopotamus differs little from that of a horse; but it is so loud as to be heard distinctly at the distance of more than a quarter of a league; *Voyage au Senegal, par M. Adanson, p. 73.*

* See the article *Lynx*, vol. v. p. 206.

† Tutti i denti sono di sostanza così dura, che percossi sopra con un cortello, o accialino, buttano faville di foco in gran quantita, ma piu le zanne che gli altri; ma dentro non sono di tanto dura materia; *Zerenghi, p. 72. . . .* Dentes habebat in inferiore maxilla sex, quorum bini exteriores e regione longi semipedem, lati, et trigoni uncias duas cum dimidio, per ambitum semipedem, aprorum modo parum retrorsum declives, non adunci, non exerti, sed admodum conspicui aperto ore. Intermedii vero parum a gingiva exerti trigona acie digitali longitudine, medium locum occupantes, veluti jacentes crassi, orbiculati, elephantini semipedem superant longitudine, atque aciem in extremis partibus planam parum

probable, gave rise to the fable of the antients, that the hippopotamus vomited fire from his mouth. The substance of the canine teeth is so white, so fine, and so hard, that it is preferable to ivory for making artificial teeth *. The cutting teeth, especially those of the under jaw, are very long, cylindrical, and chamfered. The canine teeth are also long, crooked, prismatic, and sharp, like the tusks of the wild boar. The grinders are square or oblong, like those of man, and

parum detractam. Maxillares vero utrinque septem crassos latos breves admodum. In superna vero mandibula, *quam crocodili more mobilem habet*, qua mandit et terit, anteriores sex infunt dentes, sex imis respondentes acie contrario modo adaptata, levissima ac splendida, eboris politi modo, clausoque ore conjunguntur, aptanturque imis, veluti ex illis recisi, ut planum plano infideat; verum omnium acies pyramidalis veluti oblique recisi calami modo, sed medii superiores non aciem inferiorum, at medium illorum in quo detractio conspicitur rotunditatis, petunt; ac non incidere, sed potius illis terere posse videtur. Molares totidem quot inferni, sed bini priores parvi exigui, atque rotundo ambitu, et ab aliis distant, ut medium palatum inter dentes anteriores occupare videantur; inter maxillares dentes linguae locus semipedalis remanebat. Dentium vero color eburneus parum pallens, splendidus, diaphanus fere in acie videbatur; durities illorum filicea vel magis cutelli quidem costa non parva conspicientium admiratione ignis excitabantur favillae, parum vel nihil tot percussionibus signi remanente: Quapropter verisimile foret noctis tempore dentes terendo ignem ex ore evomisse; *Fab. Columna, p. 32.*

* The finest and whitest teeth of the hippopotamus are found at Cape Mesurada in Africa. The dentists prefer them to ivory for making artificial teeth; because they are harder, whiter, and do not turn yellow so soon; *Voyage de Desmarais, tom. 2. p. 148.*

and so large that a single tooth weighs more than three pounds. The largest cutting and canine teeth are twelve * and sometimes sixteen inches long †, and each of them weighs from twelve to thirteen pounds ‡.

In fine, to give a just idea of the magnitude of the hippopotamus, we shall employ the measures of Zerenghi, and augment them one-third; because these measures were taken from the female, which was one-third less than the male in all its dimensions. This male hippopotamus was, of course, sixteen feet nine inches long, from the extremity of the muzzle to the origin of the tail, fifteen feet in circumference, and six feet and a half high; and the legs were about two feet ten inches long. The head was three feet and a half in length, and eight feet and a half

* *Post menses aliquot alium (hippopotamum) longe majorem, idem, Federicus Zerenghi, Romae nobis ostendit, cujus dentes aprini pedali longitudine fuerunt, proportione crassiores, sic et reliqua omnia majora.*—This passage, which finishes Fabricius Columna's description, proves that it was taken from the female or smaller hippopotamus of Zerenghi, and that the largest, of which he gives no description, was a male. It likewise proves that no dependence can be had on Columna's measures; for he is no where exact but in the dimensions of the teeth, because they can neither contract nor lengthen; but a skin dried in salt varies in all its dimensions.

† I remarked, that these teeth, which were crooked in the form of an arch, were about sixteen inches long, and that, where thickest, they were more than six inches in circumference; *Dampier's voyages, tom. 3. p. 360.*

‡ As to the river-horses, I never saw any of them; but I purchased some of their teeth, which weighed thirteen pounds; *Relation de Thevenot, p. 19.*

half in circumference. The opening of the mouth was two feet four inches; and the largest teeth were more than a foot long.

With such powerful arms, and such prodigious strength of body, the hippopotamus might render himself formidable to all other animals. But he is naturally mild* ; besides, he is so heavy and slow in his movements, that he could not overtake any quadruped. He swims faster than he runs; and he pursues fishes, and preys upon them †. Though he delights in the water, and lives in it as freely as upon land; yet he has not, like the beaver or otter, membranes between his toes. The great size of his belly renders his specific gravity nearly equal to that of water, and makes him swim with ease. Besides, he continues long at the bottom of the water ‡, where
he

* Qui hippopotamum animal terribile et crudele esse putarunt, falsi mihi videntur. Vidimus enim nos adeo mansuetum hoc animal, ut homines minime reformidaret, sed benigne sequeretur. Ingenio tam miti est, ut nullo negotio cicuretur, nec unquam morfu, laedere conatur. . . . Hippopotamum e stabulo solutum exire permittunt, nec metuunt ne mordeat. Rector ejus, cum spectatores oblectare libet, caput aliquot brassicae capitatae, aut melopeponis partem, aut fascem herbarum aut panem e manu sublimi protendit ferae: Quod ea conspicata tanto rictum hiatu diducit, ut leonis etiam hiantis caput facile suis faucibus caperet. Tum rector quod manu tenebat in voraginem illam seu faccum quempiam immittit. Manducat illa et devorat; *Bellonius de Aquatilibus*.

† The hippopotamus walks slowly on the banks of the rivers; but swims very quickly in the water. He lives upon fishes, and every thing he can seize; *Dampier, vol. 3. p. 360*.

‡ I have seen the hippopotamus descend to the bottom of three

he walks as in the open air; and, when he comes out of it to pasture, he eats sugar canes, rushes, millet, rice, roots, &c. of which he consumes great quantities, and does much damage in the cultivated fields. But, as he is more timid on land than in the water, it is not difficult to drive him off. His legs are so short, that, when at a distance from water, he cannot escape by flight. When in danger, his only resource is to plunge into the water, and travel under it a great way before he again appears. When hunted, he generally flies; but, when wounded, he returns with fury, darts boldly against the boats, seizes them with his teeth, tears pieces off them, and sometimes sink them*. ‘I have known,’ says a traveller †, ‘the hippopotamus open his mouth, and set one tooth on the gunnel of a boat, and another on the second strake from the keel (which was more than four feet distant), and there bit a hole through the plank, and sunk the boat; and, after he had done, he went away shaking his ears. His strength is incredibly great; for I have seen him, in the wash of the shore, when the sea has tossed in a Dutchman’s boat with fourteen hogheads of water in her, upon the said beast, and

three fathoms water, and remain there more than half an hour, before he returned to the surface; *Id. ib.*

* Hippopotamus cymbis insidiatur quae mercibus onustae secundo Nigro feruntur, quas dorsi frequentibus gyris agitata demergit; *Leon. Afric. Descript. tom. 2. p. 758.*

† Dampier, vol. 2. part. 2. p. 105.

‘ and left it dry on his back ; and another sea
 ‘ came and fetched the boat off, and the beast
 ‘ was not hurt, as far as I could perceive. How
 ‘ his teeth grow in his mouth I could not see ;
 ‘ only that they were round like a bow, and a-
 ‘ bout sixteen inches long ; and in the biggest
 ‘ part more than six inches about. We made
 ‘ several shot at him ; but to no purpose, for
 ‘ they would glance from him as from a wall.
 ‘ The natives call him a *kittimpungo*, and say he
 ‘ is *Tetisso*, which is a kind of a god ; for no-
 ‘ thing, they say, can kill him : And, if they
 ‘ should do to him as the white men do, he
 ‘ would soon destroy their canoes and fishing
 ‘ nets. Their custom is, when he comes near
 ‘ their canoes, to throw him fish ; and then he
 ‘ passeth away, and will not meddle with their
 ‘ fishing craft. He doth most mischief when
 ‘ he can stand on the ground ; but, when afloat,
 ‘ hath only power to bite. As our boat once
 ‘ lay near the shore, I saw him go under her,
 ‘ and with his back lift her out of the water, and
 ‘ overset her with six men aboard ; but, as it
 ‘ happened, did them no harm. Whilst we lay
 ‘ in the road, we had three of them, which did
 ‘ trouble this bay every full and change, and
 ‘ two or three days after. The natives say, they
 ‘ go together, two males and one female. Their
 ‘ noise is much like the bellowing of a large
 ‘ calf.’ These facts are sufficient to give an idea
 of the strength of this animal. Many similar
 facts

facts are to be found in the general history of voyages, by the Abbé-Prevost, where we have a complete and judicious collection * of all that has been delivered by travellers concerning the hippopotamus.

The individuals of this species are not numerous, and seem to be confined to the rivers of Africa. Most naturalists tell us, that the hippopotamus is also found in India. But the evidence they have of this fact appears to be equivocal. Alexander's † letter to Aristotle would be the most positive, if we could be certain that the animals mentioned in it were really hippopotami; which to me seems very problematical; for, if they were, Aristotle must have told us, in his history of animals, that the hippopotamus was a native of India as well as of Egypt. Onesicritus ‡ and some old authors say, that the hippopotamus was found in the river Indus. But this

* Hist. gen. des voyages, tom. 5. p. 95. 330.

† Humanas carnes hippopotamis pergratas esse, ex eis collegimus, quae in libro Aristotelis de mirabilibus Indiae habentur, ubi Alexander Macedo scribens ad Aristotelem inquit: 'Ducentos milites de Macedonibus, levibus armis, misi per amnem nataturos; itaque quartam fluminis partem natarunt, cum horrenda res visu nobis conspecta est, hippopotami inter profundos aquarum ruerunt gurgites, aptosque milites nobis flentibus absumpserunt. Iratus ego tunc ex eis, qui nos in insidias deducebant, centum et quinquaginta mitti in flumen jussi, quos rursus hippopotami iusta dignos poena confecerunt;' *Aldrov. de quad. digit. p. 188. et 189.*

‡ In India quoque reperitur hippopotamus, ut *Onesicritus* est autor, in amne Indo; *Hermolaus apud Gesner de piscibus, p. 417.*

this fact has received no confirmation from modern travellers, at least from such of them as merit the greatest degree of credit: They all agree*, that the hippopotamus is found in the Nile, the Senegal or Niger, the Gambia, the Zaira, and other great rivers and lakes of Africa †, especially in the southern and eastern regions of that country. None of them say positively that this animal exists in Asia. Father Boym ‡ is the only one who seems to insinuate that the hippopotamus is found in Asia. But his relation appears to be suspicious, and, in my opinion, only proves that this animal is common in Mosambique, and all the eastern parts of Africa. At present, the hippopotamus, which the ancients called the *horse of the Nile*, is so rare in the lower Nile, that the inhabitants of Egypt are totally ignorant of the name §. He is equally unknown in all the northern

* Cosmographie du Levant, par André Thevet, p. 139.—Leonis Afric. Africae descript. tom. 2. p. 758.—L'Afrique de Marmol, tom. 1. p. 51; et tom. 2. p. 144.—Relation de Thevenot, tom. 1. p. 491.—Relation de l'Ethiopie, par Poncelet. Lettres edif. 4. Recueil, p. 363.—Description de l'Egypte, par Maillet, tom. 2. p. 126.—Description du cap de Bonne-espérance, par Kolbe, tom. 3. p. 30.—Voyage de Flacourt, p. 394.—Histoire de l'Abyssinie, par Ludoff. p. 43. et 44.—Voyage au Senegal, par M. Adanson, p. 73, &c.

† Relation de l'Ethiopie, par Ch. Jacq. Poncelet; suite des Lettres edifiantes, 4. Recueil. p. 363.

‡ Flora Sinenfis, a P. Michaële Boym, p. 1.—La Chine illustrée, par d'Alquié, p. 258.

§ With regard to animals, the present inhabitants of Egypt know nothing of the hippopotamus; *Shaw's travels*.—The hippopotamus is produced in Æthiopia . . . descends by the Nile

thern parts of Africa, from the Mediterranean to the river Bambou, which runs at the foot of Mount Atlas. Hence the climate inhabited by the hippopotamus extends only from Senegal to Ethiopia, and from thence to the Cape of Good Hope.

As most authors mention the hippopotamus under the names of the *sea-horse* or the *sea-cow*, he has sometimes been confounded with the latter, which inhabits only the Northern seas. It appears, therefore, to be certain, that the hippopotami, which the author of the Description of Muscovy says are found on the sea-shore near Petzora, are nothing else than sea-cows. Aldrovandus, therefore, merits reproach for adopting this opinion without examination, and maintaining that the hippopotamus is found in the North seas *; for he not only does not inhabit

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Nile into Upper Egypt desolates the fields by devouring the grain, and particularly the Turkish wheat He is very rare in Lower Egypt; *Descript de l'Egypte, sur le Mem. de M. de Maillet, par M. l'Abbé Mascrier, tom 2. p. 126.*

* Sed quod magis mirandum est, in mari quoque versari scripsit *Plinius*, qui agens de animantibus aquaticis, communes amni, terrae, et mari *crocodilos* et *hippopotamos* praedicabat. Idcirco non debemus admiratione capi, quando legitur in descriptione *Moscoviae*, in *Oceano adjacenti regionibus Petzorae*, *equos marinos crescere*. Pariter *Odoardus-Bartosa*, Portugensis, in *Cefala* observavit multos equos marinos, a mari ad prata exire, denuoque ad mare reverti. Idem repetit *Edoardus-Vuot*, de hujusmodi feris in mari Indico errantibus. Propterea habetur in primo volumine navigationum, multos quandoque naucleros in terram descendere, ut hippopotamos in vicinis pratis pascentes comprehendant; sed ipsi ad mare fugientes

the North seas, but it appears that he is rarely found in the South seas. The testimonies of Odoardus-Barbosa and Edward Wotton, quoted by Aldrovandus, and which seem to prove that the hippopotamus inhabits the Indian seas, are nearly as equivocal as that of the describer of Muscovy; and, I am inclined to think, with M. Adanson *, that, now at least, the hippopotamus is found only in the great rivers of Africa. Kolbe †, who says he saw several of them at the
Cape

fugientes eorum cymbas aggrediuntur, dentibus illas difrum-
pendo et submergendo, et tamen bestiae lanceis, ob cutis du-
ritiem, fauciarum minime poterant; *Aldrov. de quad. digit. vivip.*
p. 181. et seq.

* In going up the Niger, we came to a quarter where the hippopotami or river-horses are very common. This animal, which is the largest of the amphibious kind, is found only in the rivers of Africa, and in no other part of the world. He is generally said to be of the figure of an ox; and, indeed, he resembles that animal more than any other. But his legs are shorter, and his head is enormously large. With regard to size, the hippopotamus may be ranked after the elephant and rhinoceros. His jaws are armed with four tusks, by which he tears up the roots of trees, which serve him for food. He cannot remain long under water without respiring, which obliges him to raise his head, from time to time, above the surface, like the crocodile; *Voyage au Senegal, par M. Adanson, p. 73.*

† If the epithet *sea* be applied to the hippopotamus or *sea-horse*, it is not because he is a species of fish, or lives always *in the sea*. He comes upon the dry land in quest of food, and he retires for safety to the *sea* or to a *river*. Herbage is his ordinary food. When pressed with hunger, he comes out of the water, in which he lies always in an extended posture. When he raises his head above the water, he looks about on all sides to see if there is any danger, and he scents a man at a considerable

Cape of Good Hope, assures us, that they plunge equally into the sea and the rivers; and the same thing

considerable distance. If he perceives any thing, he plunges again into the water, where he continues three hours without moving. . . . He generally weighs from two thousand five hundred to three thousand pounds. . . . The sea-horse, both in colour and size, resembles the rhinoceros, only his legs are somewhat shorter. His head, as Tellez remarks, (lib. 1. chap. 8.) has a greater resemblance to that of the horse, than to that of any other animal; and, from this circumstance, he has derived his name. His mouth is much larger than that of the horse, and, in this respect, he approaches nearer the ox. His nostrils are very large; and, when he rises to the surface of the river or sea, he squirts the water out of them. His ears and eyes are remarkably small. His legs are short, and of an equal thickness throughout. His hoofs are not divided into two, like those of the ox, but into four parts, on each of which there are spiral furrows. His tail is short like that of the elephant, with a few short hairs on it; and there is no hair on the rest of the body.

The paps of the female hang, like those of the cow, between the hind legs; but they, as well as the teats, are very small in proportion to the size of the animal. I have often seen the mothers suckling their young, which were then as large as sheep. . . . The skin of the river-horse is more than an inch thick, and so hard that it is difficult to kill him even with musket balls. The Europeans always aim at his head, where the skin is most tender, and easily pierced. This animal seldom receives a mortal wound in any other part of his body.

The teeth of the under jaw are very remarkable. They are four in number, two on each side, one of them crooked and the other straight. They are as thick as an ox's horn, about a foot and a half long, and each of them weighs twelve pounds. They are very white, and never turn yellow with age, as ivory does. Hence they are more esteemed than the teeth of the elephant.

The flesh of this animal, whether boiled or roasted, is most delicious.

thing is advanced by other authors. Though Kolbe is more exact than usual in his description of this animal; yet it is doubtful whether he saw it so frequently as he insinuates; for the figure he gives is still worse than those of Columna, Aldrovandus, and Prosper Alpinus, which were all drawn from stuffed skins. It is easy to perceive, that the descriptions and figures in Kolbe's works have not been taken on the spot, nor drawn from nature. His descriptions are written from memory, and most of the figures have been copied from those of other naturalists. The figure he has given of the hippopotamus has a great resemblance to the cheropotamus of Prosper Alpinus*.

Hence Kolbe, when he tells us that the hippopotamus inhabits the sea, has perhaps copied Pliny, instead of giving his own observations. Most authors relate, that this animal is only found in fresh water lakes, and in rivers, sometimes near their mouths, but oftener at great distances from the sea. Some travellers are astonished that the hippopotamus should have been called the *sea-horse*; because, as Merollo
remarks,

delicious. It is so highly valued at the Cape, as to sell at twelve or fifteen pence the pound. The fat sells as dear as the flesh: It is very mild and wholesome, and used instead of butter, &c.; *Descript. du Cap de Bonne-Esperance, par Kolbe, tom. 3. cb. 3.*

* *Note.* The figures of the cheropotami of Prosper Alpinus, *lib. 4. cap. 12. tab. 22.* seem to have been drawn from stuffed skins of hippopotami, from which the teeth appear to have been extracted.

remarks*, this animal cannot endure salt water. He generally remains in the water during the day, and comes out in the night to pasture. The male and female seldom separate. Zerenghi caught a male and a female the same day, and in the same ditch. The Dutch voyagers tell us, that the female brings forth three or four young at a time. But this fact is rendered suspicious by the very evidence which Zerenghi quotes. Besides, as the hippopotamus is of an enormous size, like the elephant, the rhinoceros, the whale, and all other large animals, it must produce but one at a time : This analogy seems to be more certain than the vague reports of travellers.

S U P P L E M E N T.

M. le Chevalier Bruce assured me, that, in his travels through Africa, he saw a number of hippopotami in Lake Tzana, which is situated in Upper Abyssinia, near the true sources of the Nile ; and that, in this lake, which is at least six leagues long by ten or twelve broad, the hippopotami are more numerous than in any other part of the world. He adds, that he saw some of them which were twenty feet long, with very thick short legs.

Addition

* Hist. gen. des voyages, tom. 5. p. 95,

Addition to the Article Hippopotamus, by Professor Allamand, Editor of the Dutch Edition of this Work.

To complete the description of the adult hippopotamus given by M. de Buffon, nothing is wanting but a genuine figure of the animal. M. de Buffon, who is always original, chose not to copy the figures published by different authors. They are all too imperfect to be used; and, with regard to the animal itself, he could not possibly procure it. Even in its native country, it is very rare, and too large to be transported without great expence and trouble. In the cabinet of natural curiosities in the university of Leyden, there is a stuffed skin of the hippopotamus, which had been sent from the Cape of Good Hope. Though it had been transmitted to Holland more than a century ago, it has been so well preserved, that it still exhibits an exact representation of the animal. It is supported by rings of iron, and by pieces of wood of such solidity, that drying has produced no considerable alterations. As it is probably the only specimen of the kind in Europe, I am persuaded that all lovers of natural knowledge will thank me for enriching the magnificent work of M. de Buffon with an exact engraving of it. The figure I have given represents the animal

mal better than any that has hitherto been drawn, or rather, it is the only figure we have of it ; for, in all the others, the hippopotamus is not distinguishable, if we except that to be found in a Dutch book, concerning the Leviathan of Holy Writ, which was copied from the same model ; but the proportions of the animal are not accurately observed.

It is unnecessary to add a description of this enormous animal, having no additions to what has been said of it by M. de Buffon and M. Daubenton.

[As the figure of the young hippopotamus, in the cabinet of the Prince of Condé, differs from that which M. Allamand had engraved from the stuffed skin in the Leyden Cabinet, and as it has a greater resemblance to a new figure given by Dr Klockner from another skin in the Prince of Orange's cabinet, I have here preferred the latter ; and I shall add some remarks of the same author, which were translated from the Dutch.]

Addition to M. de Buffon's History of the Hippopotamus, by Dr Klockner of Amsterdam.

I am surpris'd that M. de Buffon takes no notice of a passage in Diodorus Siculus, concerning the hippopotamus, especially as this antient
author

author remarks, that its voice resembled the neighing of a horse, which perhaps induced him to give it the denomination of *hippopotamus* or *river-horse*. M. de Buffon founded his opinion of this matter upon the testimonies of ancient and modern authors. Diodorus Siculus ought to have held the first rank among the former, since he not only travelled into Egypt, but is justly esteemed to be one of the best historians of antiquity. The following are the words of the passage alluded to: ‘ The Nile produces several animals, of which the crocodile and hippopotamus merit particular attention. . . . The latter is five cubits in length. His feet are cloven like those of the ruminating animals; and in each jaw he has three tusks larger than those of the wild boar. The whole mass of his body resembles that of the elephant. His skin is harder and stronger than, perhaps, that of any other animal. He is amphibious, and remains, during the day, under the water, where he moves and acts in the same manner as if he were on land, which he visits in the night, in order to feed on the herbage of the mountains. If this animal were more prolific, he would commit great devastation on the cultivated fields of Egypt. The hunting of the hippopotamus requires a number of men, who endeavour to pierce him with iron daggers. They attack him with several boats joined together, and strike with crooked harpoons.

‘ harpoons. To some of these hooks they fix a
 ‘ rope, and then leave the animal to exhaust
 ‘ himself with struggling and the loss of blood.
 ‘ His flesh is very hard, and of difficult dige-
 ‘ stion *.’

This is perhaps the best description of the hippopotamus to be found among the antients; for Diodorus commits not a single error, but with regard to the number of the animal’s toes.

Observations on the mode of preparing the skin of the Hippopotamus, now in the Prince of Orange’s Cabinet, by Dr Klockner.

I received from the Hague, in a very dry state, the skin of this hippopotamus, with the head inclosed within it. The skin had been first salted, then dried, and afterwards the skin of a young hippopotamus, (which is likewise in the Prince’s cabinet) steeped in brine, was, in a moist state, put into the adult skin. After which, the whole was packed up in coarse cloth, and transmitted from the Cape of Good Hope to Holland. The small skin and the head, of course, produced a disagreeable odour of rancid grease, which attracted the insects, and they damaged the large skin that was first exposed to their attacks.

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* Diodor. Sicul. lib. 1. p. 42. edit. Wefelingii.

When I diluted the head, it swelled greatly. The opening of the mouth was more than sixteen inches of Amsterdam measure*. The upper and under lips were sufficiently large to cover all the animal's teeth, especially as the inferior canine teeth are crooked, and slip along the curvature of the superior, in the form of scissars, and pass into a socket formed by the skin of the lip and the gums. Between the cutting teeth and the cylindrical grinders, as well as between the tongue and cutting teeth, there is a smooth hard skin; and the palate is full of notches or hollows. The tongue had been cut out The flesh on each side of the head had also been removed; and the fat which remained was corrupted. The whole, however, was interspersed with very strong muscles, and the flesh about the two lips was red and white, or of the colour of an ox's tongue.

Immediately behind the inferior canine teeth, there is a protuberance, which, when the mouth is shut, fills the space between the canine teeth and grinders. This opening, though filled, has contracted one half in drying, as well as the lips.

Under the ears, and around the auditory passage, which is remarkably small, as well as in the orbits of the eyes, there was a great quantity of fat.

The ears are placed upon an eminence, and in such a manner as to form circular folds. The elevation

* The Amsterdam foot is only ten inches five lines of the French foot.

elevation of the right ear was much diminished in drying; but it was conspicuous in the left.

We know that the ears of the hippopotamus are very small. But those of our subject had been considerably diminished by insects. The internal part of the ears is garnished with fine close hair; but there is very little hair on the outside.

The eyes must have been very small; for the sockets were uncommonly small in proportion to the magnitude of the animal. The eyes I placed in my subject are perhaps larger than nature; but, when I used smaller ones, they did not seem to correspond with the animal.

The nostrils slope downward, and have a small aperture. They are afterwards joined internally by a small crooked line. When the skin was dry, it was difficult to perceive these tubes. I enlarged them a little before the skin was again dried.

I must here remark, that I only found thirty-two teeth in this hippopotamus, which accords not either with Zerenghi's or M. Daubenton's descriptions. The first says, that he found forty-four teeth in his subjects; and the second found thirty-six in the head preserved in the Royal Cabinet. This difference excited my attention: But I could perceive no marks of teeth having fallen out, except one of the cutting teeth, which seemed to have been broken. There are four canine teeth placed perpendicularly, eight cutting teeth, four in the upper jaw, which are perpendic-
ular,

pendicular, and four in the under jaw, placed horizontally, as may be seen in the figure. Besides, I found two grinders in each side of the under jaw, and three teeth, placed before the grinders, which had the form of kayles. In each side of the upper jaw, were three grinders, and two of these cylindrical teeth. Between these cylindrical teeth, there is a space of about half an inch.

[I must here remark, says the Count de Buffon, that the hippopotamus has commonly thirty-six teeth, namely, four cutting teeth above, and four below, and two canine teeth and twelve grinders in each jaw. This observation has been verified by three heads, which have long remained in the Royal Cabinet, and by a fourth head, which was transmitted to me, in the month of December 1775, by M. de Sartine, secretary of state to the marine department. The last grinder, at the bottom of the mouth, is much thicker, broader, and flatter on the edge, than the other five. But I am inclined to think that the number of grinders varies according to the age of the animal; and that, instead of twenty-four, we may sometimes find twenty-eight, and even thirty-two, which, as Zerenghi remarks, would make forty-four in all.]

The upper and under lips, continues Dr Klockner, are garnished, at considerable distances, with small tufts of hair, which, like pencils, proceed from one tube. I counted about twenty of them.

I examined a section of one of these tubes with the microscope, and found seven roots issuing from one tube. These seven roots afterwards split, and each gave rise to several hairs, which formed a kind of pencil.

On the sides of the mouth, toward the lower part, I saw some fine hairs, which were placed nearer each other than the former.

Besides, I found here and there upon the body some scattered hairs; but there were none upon the legs, flanks, or belly.

The extremity and edges of the tail were garnished with pencils of hair, like the nose; but they were a little longer.

I could not discover the sex of this animal. Near the fundament there was a kind of triangular pinked aperture, about six inches wide, where I imagined the organs of generation had been situated; but, as no vestige of them remained, it was impossible to ascertain the sex.

The skin of the belly, near the hind legs, was an inch and nine lines thick: Here the insects had made a hole, which rendered it an easy matter to measure the thickness. The substance of the skin was white, cartilaginous, and coriaceous; and, at this place, it was well separated from the fat and flesh. Higher up, toward the back, a good deal of the skin had been pared off, with a view, no doubt, to render it lighter for carriage. It was for this reason that the skin
about

about the spine exceeded not an inch in thickness.

The toes were furnished with nails. The skin between the toes was very wide; and I believe that the feet of this animal, when alive, were rather flat than round. The heel, which is placed high and backward, appeared to be well adapted for swimming. The hoof, though thick and hardened, was nevertheless flexible.

The dimensions of this animal were nearly the same with those of Zerenghi's female hippopotamus, formerly described.

I was told, that this hippopotamus had advanced a great way upon land in the territories of the Cape, and even near the place called the *Mountains of snow*, when it was shot by Charles Marais, a peasant of French extraction. This peasant brought the skin to M. de Piettenberg, Governour of the Cape, who transmitted it to his Highness the Prince. I had the relation from a nephew of C. Marais, who resides in Amsterdam. According to the account given by this man, who had it from the mouth of Marais, the hippopotamus runs extremely swift, both in marshy places and on the firm ground. It is for this reason that the peasants, though excellent hunters, dare not fire upon him but when he is in the water. They lie in wait for him about sunset, when the animal raises his head above the water, and keeps his small ears in perpetual agitation, in order to hear if any noise is near.

When

When any object of prey appears upon the water, he darts upon it like an arrow from a bow. While the hippopotamus is listening in this manner, and floating on the surface of the water, the hunters endeavour to shoot him in the head. The one whose skin I stuffed was shot between the eye and the right ear; and the young one, which is also in the Prince's cabinet, had been shot, or struck with an harpoon, in the breast, as appears from inspection. When he feels that he is wounded, he plunges below the water, and walks or swims till he loses both motion and life. Then, by means of about twenty oxen, he is dragged on shore and dissected. An adult hippopotamus generally yields about two thousand pounds of fat, which is salted and sent to the Cape, where it sells very dear. This fat or lard is extremely good, and in relish excels all others. When pressed, it yields a mild oil, as white as cream. In Africa, it is recommended as a sovereign remedy for diseases of the breast. The quantity of lard derived from an individual, demonstrates that this animal is of a surprising weight and magnitude.

Before finishing my remark, I shall here add some particulars, regarding the natural history of the hippopotamus, which are not to be found in the preceding description.

We have seen, that the hippopotamus probably derived his name from the resemblance of his voice to the neighing of a horse. From the
 most

most authentic accounts, however, it appears that his cry has a greater similarity to that of the elephant, or to the stammering and indistinct sounds uttered by deaf persons. Beside this cry, the hippopotamus, when asleep, makes a kind of snorting noise, which betrays him at a distance. To prevent the danger arising from this circumstance, he generally lies among the reeds that grow upon marshy grounds, and which it is difficult to approach.

I can nowhere find the remark of Marais, concerning the agility of this animal, confirmed. We are perpetually assured, on the contrary, that the hunters choose rather to attack him on land than in the water, which indicates, that they are not afraid of his swiftness. According to other historians, his return to the river is cut off by trees and ditches; because they know that he uniformly inclines to regain the water, where he has no other animal to fear, rather than to fight or fly upon land. The great shark and the crocodile avoid the hippopotamus, and dare not engage with him.

The skin of the hippopotamus is so extremely hard on the back, the crupper, and the external parts of the thighs and buttocks, that neither arrows nor musket balls can pierce it. But it is softer and thinner on the inside of the thighs and belly, where the hunters endeavour to shoot him, or to pierce him with a javelin. He is extremely tenacious of life; and, therefore, they
try



A. Belli sculp.

HIPPOPOTAMUS.

try to break his legs by large blunderbuffs, charged with iron wedges. When they succeed, they are full masters of the animal. The Negroes, who attack the sharks and crocodiles with long knives and javelins, are afraid of the hippopotamus, and would perhaps never attempt to combat him, unless they knew that they could outrun him. They believe, however, that this animal has a stronger antipathy to the Whites than to the Blacks.

The female brings forth on land, where she suckles her young, and soon teaches it to take refuge in the water, when the smallest noise is heard.

The Negroes of Angola, Congo, Elmina, and, in general, of the whole west coast of Africa, regard the hippopotamus as one of those inferior divinities which they call *Fetiches*. They scruple not, however, to eat his flesh, when they can procure it.

I am uncertain whether I should here quote a passage from P. Labat, where he says that the hippopotamus, who is of a very sanguiferous temperament, knows how to let blood of himself. For this purpose, he remarks, the animal searches for a sharp-pointed rock, and rubs himself against it, till he makes a sufficient aperture for the blood to flow. To promote the flux, he agitates his body; and, when he thinks he has lost a sufficient quantity, he rolls in the mud in

order to shut up the wound. In this story there is nothing impossible ; but how could P. Labat discover this singular operation ?

Beside the uses to which the skin and teeth of the hippopotamus are applied, we are assured that the Indian painters employ the blood of this animal as one of their colours.

The

The ELK * and the RAIN-DEER. **

THOUGH the elk and rain-deer are animals of different species, yet, as it would be difficult to give the history of the one without

* The elk has horns with short beams spreading into large and broad palms, one side of which is plain, the outmost furnished with several sharp snags. It has no brow antlers. The largest horn I have seen is in the house belonging to the Hudson's Bay company, and weighed 56 pounds. The length is 32 inches, between tip and tip 34, and the breadth of the palm $13\frac{1}{2}$. There is in the same place an excellent picture of an elk, which was killed in the presence of Charles XI. of Sweden, and weighed 1229 pounds. It is a very deformed and seemingly disproportioned beast. A young female, of about a year old, was to the top of the withers 5 feet or 15 hands. The head alone was two feet, and the length of the whole animal, from nose to tail, was about seven feet. The neck was much shorter than the head, with a short, thick, upright mane, of a light brown colour. The eyes were small, the ears one foot long, very broad and slouching, and the nostrils very large. The upper lip was square, hung greatly over the lower, and had a deep sulcus in the middle, so as to appear almost bifid. The nose was very broad. Under the throat was a small excrescence, from whence hung a long tuft of coarse black hair. The withers were very high, and the fore-feet three feet three inches long. From the bottom of the hoof to the end of the tibia was two feet four inches. The hind legs were much shorter than the fore-legs. The hoofs were much cloven; and the tail is very short, dusky above, and white beneath. The general colour of the body was

out inroaching on that of the other, we find it convenient to treat of them under one article. Most antient, as well as modern authors, have confounded

was a hoary black, but more gray above the face than any where else. This animal was living last spring at the Marquis of Rockingham's house, at Parson's-green; *Pennant's synopsis of quad* p. 40.

In the Celtic language, *Elch*; in modern Latin, *Alce*; in Greek, *Αλλη*; in German, *Hellend* or *Ellend*; in Polish, *Losi*; in Swedish, *Oelg*; in Russ, *Lozzi*; in Norwegian, *Ælg*; in Chinese, *Han-ta-han*; in Canada, *Original*; in French, *Elan*.

Alce, machlis; *Plin. lib. 8. c. 15. Gesner quad. p. 1. Munster, Cosmog. p. 383.*

Cervus palmatus, *Alce vera et legitima*; *Klein. quad. p. 24.*

Cervus cornibus ab imo ad summum palmatis; *Briffon. quad. p. 6. Faunal. Sinens.*

Cervus alces, *cornibus acaulibus palmatis*, *caruncula gutturali*; *Lin. Syst. Nat. p. 92.*

Elk; *Raii Syn. quad. p. 86. Scheffer. Lapl. p. 133. Bell's trav. vol. 1. p. 5. 215. 322.*

* * The rain-deer has large but slender horns, bending forward, the top palmated, brow antlers broad and palmated. Both sexes have horns; those of the female are less, and with fewer branches. A pair from Greenland were three feet nine inches long, two feet and a half from tip to tip, and weighed nine pounds twelve ounces. The height of a full grown rain is four feet six inches. The space round the eyes is always black. When it first sheds its coat, the hairs are of a brownish ash colour, and afterwards change to white. The hairs are very close set together, and, along the fore part of the neck, they are very long and pendent. The hoofs are large, and the tail short; *Pennant's synopsis of quad. p. 46.*

The rain-deer was unknown to the Greeks. In French, *Rangier*, *Ranglier*, *le Renne*; in Latin *Tarandus*; in Norwegian, *Reben*; in Lapland, *Boetfoi*; in German, *Reenthier*; in Swedish, *Rhen*; in Canada, *Caribou*; in modern Latin *Rangifer*. — In partibus magnae Lapponiae bestia est de genere cervorum. — Rangifer duplici ratione dicta; una quod in ca-
pite

confounded them, or exhibited them by equivocal denominations, which might be equally applied to both. The Greeks knew neither the elk nor the rain-deer; for Aristotle * makes no mention of them: And, among the Latins, Julius Cæsar is the first who employed the word *Alce*. Pausanias †, who wrote about a century after Cæsar,

pite ferat alta cornua velut quos quercinarum arborum ramos: Alia quod instrumenta cornibus pectorique, quibus hiemalia plaustra trahit imposita Rancha et Lochæ, patrio sermone vocantur; Olai Magni. hist. de gent. sept. p. 135.

Rangier or Ranglier; *Gaston de Foix apud du Fouilloux, p. 98.*

Tarandus, Rangifer; *Gesner quad. p. 839. Icon. quad. p. 57. Aldrov. de quad. bisulc. p. 859.*

Cervus mirabilis; *Johanson, de quad. tab. 36. Munster Cosmog. p. 1054.*

Cervus rangifer; *Raii synopsis. quad. p. 88. Klein. quad. p. 23.*

Daim de Groenland; *Edwards; Hist. des Oiseaux, part. 1. p. 51.*

Cervus cornuum summitatibus omnibus palmatis; *Briffon. regn. anim. p. 92.*

Cervus Tarandus, cornibus ramosis, recurvatis, teretibus, summitatibus palmatis; *Linn. syst. nat. p. 93.*

Rein-deer; *Schaeffer. suppl. p. 82. 129. Le Brun's travels, vol. 1. p. 10. Oeuvres de Maupertuis, tom. 3. p. 198. Voyage d'Outier, p. 141. Hist. Kamtschatka, p. 228. Bell's travels, vol. 1. p. 213. Martin's Spitzberg. p. 99. Crantz's Greenland, vol. 1. p. 70. Egede Greenl. p. 60. Dobb's Hudson's Bay, p. 20. 22. Voyage au Hudf. Bay, tom. 2. p. 17.*

Rheno; *Linn. Amoen. Acad. p. 4.*

La Caribou; *Charlevoix, Hist. Nouv. France, tom. 5. p. 190.*

* We have shown, under the article *Axis*, that the hippelaphus of Aristotle is not the elk.

† Argumento sunt Æthiopici tauri et *alces* ferae Celticae, ex quibus mares cornua in superciliis habent, foemina caret.

Pausan.

Caesar, is the first Greek author in which the name *Αλκη* occurs; and Pliny*, who was nearly contemporary with Pausanias, has given some obscure

Pausan. in Eliacis.——*Alce* nominata fera specie inter cervum et camelum est; nascitur apud Celtas; explorari investigarique ab hominibus animalium sola non potest, sed obiter aliquando dum alias venantur feras, haec etiam incidit. Sagacissimam esse aiunt, et hominis odore per longinquum intervallum percepto, in foveas et profundissimos specus sese abdere. Venatores montem vel campum ad mille stadia circumdant, et contracto subinde ambitu, nisi intra illum fera delitescat, non alia ratione eam capere possunt; *Idem. In Boeoticis.*

* Septentrio fert et equorum greges ferorum, sicut asinorum Asia et Africa: Praeter ea alcem, ni proceritas aurium et cervicis distinguat, jumento similem: Item notam in Scandinavia insula, nec unquam visam in hoc orbe, multis tamen narratam, *machlin*, haud dissimilem illi, sed nullo suffraginum flexu; ideoque non cubantem, sed acclivem arbori in somno, eaque incisa ad insidias, capi; velocitatis memoratae. Labrum ei superius praegrande: Ob id retrograditur in pascendo, ne in priora tendens, involvatur; *Plin. hist. nat. lib. 8. cap. 15.*

——Mutat colores et Schytarum tarandus.——Tarandus magnitudo quae bovi, caput majus cervino, nec ab simile; cornua ramosa; ungulae bifidae: Villus magnitudine urforum, sed cum libuit sui coloris esse, asini similis est: Tergoris tanta duritia ut thoraces ex eo faciant.——Metuens latet, ideoque raro capitur; *Plin. Hist. nat. lib. 8. cap. 34.*

——I have quoted these two passages of Pliny, in which, under the denomination of *alce*, *machlis*, and *tarandus*, he seems to point out three different animals. But I shall afterwards show, that both *machlis* and *alce* apply solely to the elk; and that, though most naturalists believe the *tarandus* of Pliny to be the elk, it is much more probable that he means the rain-deer by this appellation. I acknowledge, however, that the indications of Pliny are so confused, and even false, that it is difficult to determine this point with precision. The commentators upon Pliny, though they had much erudition, were

obscure intimations of the elk and rain-deer under the appellations of *alce*, *machlis*, and *tarandus*. The name *alce*, therefore, cannot be properly considered as either Greek or Latin; but it appears to have been derived from the Celtic language, in which the elk is called *elch* or *elk*. The Latin name of the rain-deer is still more uncertain. Several naturalists have thought that it was the *machlis* of Pliny; because this author, when speaking of the northern animals, mentions, at the same time, the *alce* and the *machlis*; the last of which, he remarks, is peculiar to Scandinavia, and was never seen either at Rome, or any part of the Roman empire. In Caesar's Commentaries*, however, we find a passage, which can

were but little verified in natural history; and this is one reason why we find so many obscure and ill interpreted passages in his writings. The same remark is applicable to the commentators and translators of Aristotle. We shall, therefore, endeavour to restore some words which have been changed, and to correct some passages of those two authors that have been corrupted.

* Est bos in Hércinia silva, cervi figura, cujus a media fronte inter aures unum cornu existit excelcius, magisque directum his quae nobis nota sunt cornibus: Ab ejus summo sicut palmae ramique late diffunduntur. Eadem est foeminae marisque natura; eadem forma, magnitudoque cornuum; *Jul. Caesar. de bello Gallico. lib 6. Note.* This passage is decisive. The rain-deer, in fact, has brow antlers which seem to form an intermediate horn. His horns are divided into several branches, terminated by large palms; and the female has horns as well as the male. But the females of the elk, the stag, the fallow-deer, and the roe-deer, have no horns. Hence

can apply to no other animal than the rain-deer, and seems to prove that it then existed in the forests of Germany; and Gaston Phaebus, fifteen centuries after Julius Caesar, seems to speak of the rain-deer, under the name of *rangier*, as an animal, which, in his time, existed in the forests of France. He has even given a good description * of this animal, and of the manner of

Hence it is apparent, that the animal here pointed out by Caesar, is the rain-deer, and not the elk; especially as, in another place, he mentions the elk, under the name of *alce*, in the following terms: Sunt item in Hercinia silva quae appellantur *Alces*: Harum est confimilis capris (*capreis*) figura et varietas pellium: Sed magnitudine paulo antecedunt mutilae quae sunt cornibus et crura sine nodis articulisque habent, neque quietis causa procumbunt.——His sunt arbores procubilibus: Ad eas se applicant: Atque ita paulum modo reclinatae quietem capiunt: Quarum ex vestigiis cum est animadversum a venatoribus quo se recipere consueverint, omnes eo loco aut a radicibus subruunt aut abscindunt arbores tantum ut summa species earum stantium relinquatur: Huc cum se consuetudine reclinaverint, infirmas arbores pondere affigunt atque una ipsae concidunt; *de bello Gallico, lib. 6.* I allow that this second passage contains nothing precise but the name *alce*; and to make it apply to the elk, the word *capreis* must be substituted for *capris*; and we must suppose, at the same time, that Caesar had only seen female elks, which have no horns. All the rest is intelligible; for the elk has very stiff limbs, that is, their articulations are very firm and close; and, as the ancients believed, that there were animals, such as the elephant, which could neither bend their limbs nor lie down, it is not surprising that they attribute to the elk this fabulous story of the elephant.

* The *rangier* or *ranglier* is an animal that resembles the stag; but his horns are larger and much more branched. When hunted, he flies, on account of the great weight on his head.



Abell's engr.

ELK.

of hunting him. As his description cannot apply to the elk, and as he gives, at the same time, the mode of hunting the stag, the fallow deer, the roebuck, the wild goat, the chamois goat, &c. it cannot be alledged, that, under the article *rangier*, he meant any of these animals, or that he had been deceived in the application of the name. It is apparent, therefore, from these positive evidences, that the rain-deer formerly existed in France, especially in the mountainous parts, such as the Pyrennees, in the neighbourhood of which Gaston Phaebus resided, as Lord of the county of Foix; and that, since this period, they have been destroyed, like the stags, which were formerly

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S f

common

head. But, after running long, and doubling, he places his buttocks against a tree, to prevent any attack from behind, and bends his head toward the ground. In this situation, the dogs dare not approach him, because his whole body is defended by his horns. If they come behind him, he strikes them with his heels. The grey-hounds and bull-dogs are terrified when they see his horns. The *rangier* is not taller than the fallow deer; but he is much thicker. When he rears his horns backward, they cover his whole body. He feeds like the stag or fallow deer, and throws his dung in clusters. He lives very long. The hunters shoot him with arrows, or take him with different kinds of snares. He is fatter than a stag. Like the fallow deer, he follows the stag in the rutting season.

As to the manner of hunting the *rangier* or *ranglier*; when the hunters go in quest of this animal, they should separate the dogs, to prevent his running into the thickest parts of the forest, which are inhabited by the fallow deer and roebucks. He should spread his nets and snares according to the situation of the forest, and lead his hounds through the wood. As the horns of the *rangier* are high and heavy, few hunters attempt to seize him with hounds; *La Venerie de Jacques Du-fouilloux*, p. 97.

common in this country, and which now exist not in Bigore, Couferans, nor in the adjacent provinces. It is certain that the rain-deer is found only in more northern latitudes. But we likewise know, that the climate of France was formerly much moister and colder, on account of the many forests and marshes which have since been cut down and drained. From the Emperor Julian's letter, we learn what was the rigour of the frost at Paris in his time. The description he gives of the ice on the Seine is perfectly the same with what the Canadians tell us of the ice in the rivers of Quebec. Gaul, under the same latitude with Canada, was, two thousand years ago, exactly what Canada is at present, namely, a climate sufficiently cold to nourish animals which are now found only in the more northern regions.

From all these facts, therefore, it is evident, that the elk and the rain-deer formerly existed in the forests of Gaul and Germany; and that the passages in the Commentaries of Caesar can apply to no other animals. In proportion as the lands were cleared, and the waters dried up, the temperature of the climate would become more mild, these animals, who delight in cold, would first abandon the flat countries, and retire to the snowy mountains, where they still subsisted in the days of Gaston de Foix. The reason why they are no longer found there is obvious: The heat of the climate has been gradually

dually augmented by the almost total destruction of the forests, by the successive lowering of the mountains, by the diminution of the waters, by the multiplication of the human race, and by culture and improvement of every kind. It appears likewise, that Pliny has borrowed from Caesar almost every thing he has said of these two animals, and that he was the first who introduced confusion into their names. The *alce* and the *machlis* he mentions at the same time; from which we are led to conclude that these two names denote two different animals*. But, if we consider, 1. That he mentions the *alce* only once, without giving any description of it; 2. That he alone employs the word *machlis*, which is neither Greek nor Latin, but seems to have been coined †, and, according to his commentators, is changed into *alce* in several antient manuscripts; 3. That he attributes to the *machlis* all that Julius Caesar has said of the *alce*;

* Several of our most learned naturalists, and particularly Mr Ray, have thought that the *machlis*, being placed so near the *alce*, could be no other than the rain-deer. *Cervus rangifer*, the rain-deer; *Plinio machlis*; *Raii synops. quad. p. 88*. Because I am by no means of the same opinion, I have here given a detail of my reasons.

† On the margin of this passage of Pliny, we have *achlin*, instead of *machlin*: *Fortassis achlin, quod non cubet*, say the commentators. This name, therefore, appears to have been coined on the supposition that the animal cannot lie down. On the other hand, by transposing the *l* in *alce*, they have made *acle*, which differs little from *achlis*. Hence we may still farther conclude, that this word has been corrupted by the transcribers, especially as we find *alcem*, instead of *machlin*, in several antient manuscripts.

alce; the passage of Pliny must unquestionably have been corrupted, and those two names must denote the same animal, namely the *elk*. The decision of this question will resolve another. As the *machlis* is the *elk*, the *tarandus* must be the *rain-deer*. The name *tarandus* is found in no other author before Pliny, and has given rise to various interpretations. Agricola and Elliot, however, have not hesitated to apply it to the *rain-deer*; and, for the reason above assigned, we willingly subscribe to their opinion. Besides, we should not be surprised at the silence of the Greeks, nor at the ambiguity with which the Latins have mentioned these animals; since the northern regions were absolutely unknown to the former, and the latter had all their information concerning them from the relations of others.

Now, in Europe and Asia, the *elk* is found only on this side, and the *rain-deer* beyond the Polar circle. In America, we meet with them in lower latitudes; because there the cold is greater than in Europe. The *rain-deer*, being able to endure the most excessive cold, is found in Spitzbergen*; he is also very common in Greenland,

* In every part of Spitzbergen, the *rain-deer* are found, but particularly in *Reben-feld*, a place which received its name from the number of *rain-deer* it produces. They are also very numerous in Foreland near Muscle-Haven.——We arrived in this country in the spring, and killed some *rain-deer*, which were very meager; from which circumstance we conclude, that, notwithstanding the unfertility and coldness of Spitzbergen,

land *, and in the most northern regions of Lapland † and of Asia ‡. The elk approaches not so near

Spitzbergen, these animals make a shift to pass the winter there, and to live upon the small quantity of food they can procure; *Recueil des Voyages au Nord, tom. 2. p. 113.*

* Captain Craycott, in the year 1738, brought a male and a female rain-deer from Greenland to London; *Edward's Hist. of birds, p. 51.* where we have a description and figure of this animal under the name of the *Greenland fallow-deer*, which, as well as the *Greenland roebuck*, or *Caprea Groenlandica*, mentioned by Grew, in his description of the museum of the royal society, can be nothing else but the rain-deer. Both these authors, in their descriptions, mention, as a peculiar character, the down with which the horns of these animals were covered. This character, however, is common to the rain-deer, the stag, the fallow deer, and all the deer kind. This hair or down continues on the horns during the summer-season, which is the time when they are growing, and the only time that vessels can sail to Greenland. It is not, therefore, surprising that, during this season, the horns of the rain-deer should be covered with down. Hence this character is of no importance in the descriptions given by these authors.

Upon the coasts of Frobisher's Straits, there are stags nearly of the colour of asses, and whose horns are higher and much larger than those of our stags. Their feet are from seven to eight inches in circumference, and resemble those of our oxen; *Lade's voy. tom. 2. p. 297. Note.* This passage seems to have been copied from Captain Martin's voyage, p. 17. where he remarks, 'There are great numbers of stags on the lands off Warwick road, the skin of which resembles our asses. Their head and horns, both in length and breadth, surpass those of our stags. Their foot is as large as that of an ox, being eight inches broad.'

† The rain-deer are numerous in the country of the Samoiedes, and over all the north; *Voyage d'Olearius, tom. 1. p. 126. L'Hist. de la Lapponie, par Scheffer, p. 209.*

‡ The Ostiacks of Siberia, as well as the Samoiedes, employ rain-deer and dogs for drawing their carriages; *Nouv. Mem. de la Grande Russie, tom. 2. p. 181.*—Among the Tonguese, there are great numbers of rain-deer, elks, bears, &c.; *Voyage de Gmelin, tom. 2. p. 206.*

near the pole, but inhabits Norway*, Sweden †, Poland ‡, Lithuania §, Ruffia §, and Siberia and Tartary**, as far as the north of China. In Canada, and in all the northern parts of America, we meet with the elk, under the name of the

* See the chase of the elk in Norway, by the Sieur de la Martiniere, in his *Voyage to the North*, p. 10.

† *Alces habitat in silvis Sueciae, rarius obuius hodie, quam olim; Linn. Fauna Suecica, p. 13.*

‡ Tenent alces praegrandes Albae Ruffiae fylvae, fivent Palatinatus varii, Novogrodenfis, Breſtanenſis Kiovienſis, Volhinienſis circa *Stepan*, Sandomirienſis circa *Niſko*, Livoniienſis in Capitaneatibus quatuor ad Poloniae regnum pertinentibus, Varmia iis non deſtituitur; *Rzaczynski auſtuarum*, p. 305.

§ The *Loſſ* of the Lithuanians, the *Lozzi* of the Muſcovites, the *Oelg* of the Norwegians, the *Elend* of the Germans, and the *Alce* of the Latins, denote the ſame animal: It is very different from the Norwegian *Rehen*, which is the reindeer. . . . No elks are produced in Lapland; but they are brought from other places, and particularly from Lithuania They are found in South Finland, in Carelia, and in Ruffia; *Hiſt. de la Lappomie, par Scheffer*, p. 310.

§ In the neighbourhood of Irkutzk, there are elks, ſtags &c.; *Voyage de Gmelin, tom. 2. p. 165.*—The elks are common in the countries of the Mancheous Tartars and of the Solons; *Id. ib.*

** The Tartarian animal called *Han-ta-han* by the Chineſe appears to be the ſame with the elk. ‘The han-ta-han,’ ſay the Miſſionaries, ‘is an animal which reſembles the elk. ‘The hunting of it is a common exerciſe in the country of ‘the Solons, and the Emperor Kam-hi ſometimes partakes ‘of this amuſement. There are han ta-hans as large as our ‘oxen. They are only found in particular cantons, eſpecially toward the mountains of Sevelki, in marſhy grounds, ‘which they are fond of, and where they are eaſily hunted, ‘becauſe their weight retards their flight;’ *Hiſt. gen. des voyages, tom. 16. p. 602.*

the *original*, and the rain-deer under that of *caribou*. Those naturalists who suspect that the *original* * is not the elk, and the caribou

* The *elks* or *originals* are frequent in the province of Canada, and very rare in the country of the Hurons; because these animals generally retire to the coldest regions. . . . The Hurons call the elks *Jondareinta*, and the caribous *ausquoy*, of which the savages gave us a foot, which was hollow, and so light, that it is not difficult to believe what is said of this animal, that he walks on the snow without making a track. The elk is taller than a horse. . . . His hair is commonly gray, sometimes yellow, and as long as a man's finger. His head is very long, and he has double horns like the stag. They are as broad as those of the fallow deer, and three feet in length. His foot is cloven, like that of the stag, but much larger. His flesh is tender and delicate. He pastures in the meadows, and likewise eats the tender twigs of trees. Next to fish, he is the principal food of the Canadians; *Voyage de Sagard Theodat*, p. 308.—There are elks in Virginia; *Hist. de la Virginie*, p. 213.—We find in New England great numbers of *originals* or *elks*; *Descript. de l'Amerique Septent. par Denys*, tom. 1. p. 27.—The island Cape Britain was famed for the chase of the *original*, where they were very numerous; but they have since been extirpated by the Savages; *Id.* tom. 1. p. 163.—The *original* of New France is as strong as a mule; his head is nearly of the same shape. His neck is longer, and his whole body more meager. His limbs are long and nervous. His foot is cloven, and his tail is very short. Some of them are gray, others reddish or black, and, when old, their hair is hollow, as long as a man's finger, and makes excellent mattresses, or ornaments for saddles. The elk has large, flat, palmated horns. Some of them are a fathom long, and weigh from a hundred to a hundred and fifty pounds. They shed, like those of the stag; *Id.* tom. 2. p. 321.—The *original* is a species of elk, very little different from those we see in Muscovy. He is as large as a mule, and of a similar figure, excepting in the muzzle, the tail, and the large flat horns, which, if we may credit the Savages, sometimes

bou * the rain-deer, have not compared nature with the relations of travellers. Though smaller, like all the other American quadrupeds, than those of the Old Continent, they are unquestionably the same animals.

We will acquire juster ideas of the elk and rain-deer by comparing both with the stag: The elk
is

times weigh three hundred, and even four hundred pounds. This animal commonly frequents open countries. His hair is long and of a brown colour. His skin, though not thick, is very strong and hard. His flesh is good, but that of the female is most delicate; *Voyage de la Hontan, tom. 1. p. 86.*

* The caribou is an animal with a large muzzle and long ears As his foot is broad, he runs with ease over the hardened snow, which distinguishes him from the original, whose feet always sink; *Voyage de la Hontan, tom. 1. p. 90.*—The island of Saint John is situated in the great bay of Saint Laurence. There are no originals in this island; but there are caribous, which seem to be another species of original. Their horns are not so strong; their hair is thinner and longer, and almost entirely white. Their flesh is whiter than that of the original, and makes excellent eating; *Descript. de l'Amerique septent. par. Denys, tom. 1. p. 202.*—The caribou is a kind of stag, which is very nimble and strong; *Voyage de Dierville, p. 125.*—The caribou is not so tall as the original, and its figure partakes more of the ass than of the mule, and equals the stag in fleetness. Some years ago, one of them was seen on Cape Diamond, above Quebec The tongue of this animal is much esteemed. His native country seems to be in the neighbourhood of Hudson's Bay; *Hist. de la Nouv. France, par le P. Charlevoix, tom. 3. p. 129.*—The finest hunting in North America is that of the caribou. It continues the whole year; and, particularly, in spring and autumn, we see them in troops of above three or four hundred at a time The horns of the caribou resemble those of the fallow deer. When first seen by our sailors, they were afraid and ran from them; *Lettres edifiantes, recueil 10. p. 322.*

is taller, thicker, and stands higher on his legs; his neck is also shorter, his hair longer, and his horns much longer than those of the stag. The rain-deer is not so tall; his limbs * are shorter and thicker, and his feet much larger. His hair is very bushy, and his horns are longer, and divided into a great number of branches †, each of which is terminated by a palm: But those of the elk have the appearance of being cut off abruptly, and are furnished with broaches. Both have long hair under the neck, short tails, and ears much longer than those of the stag. Their

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motion

* The stag stands higher on his legs, but his body is smaller than that of the rain-deer; *Hist. de la Laponie, par Scheffer, p. 205.*

† Many rain-deer have two horns, which bend backward, as those of the stag generally do. From the middle of each a small branch issues, which divides, like those of the stag, into several antlers that stretch forward, and, by their figure and situation, might pass for a third horn, though it frequently happens that the large horns push out similar branches from their own trunks: Thus another small branch advances toward the front, and then the animals seem to have four horns, two behind like the stag, and two before, which last is peculiar to the rain-deer. The horns of the rain-deer are also sometimes disposed in the following manner; two bend backward, two smaller ones mount upward, and two still smaller bend forward, being all furnished with antlers, and having but one root. Those which advance toward the front, as well as those which mount upward, are, properly speaking, only branches or shoots of the large horns which bend backward like those of the stag. This appearance, however, is not very common; we more frequently see rain-deer with three horns, and the number of those with four, as formerly described, is still greater. All this applies only to the males; for the horns of the females are smaller, and have not so many branches; *Scheffer, p. 306.*

motion consists not of bounds or leaps, like the stag and roebuck: It is a kind of trot, but so quick and nimble, that they will pass over nearly the same ground in an equal time, without being fatigued; for they will continue to trot in this manner during a whole day, or even two days*. The rain-deer keeps always on the mountains †; and the elk inhabits low grounds and moist forests. Both go in flocks like the stag; and both may be tamed; but the rain-deer is more easily tamed than the elk. The latter, like the stag, has never lost its liberty, But the rain-deer has been rendered domestic by the most stupid of the human race. The Laplanders have no other cattle. In this frozen climate, which receives only the most oblique rays of the sun, where the night and the day constitute two seasons, where the earth is covered with snow from the beginning of autumn to the end of spring, where the bramble, the juniper, and the moss, constitute the only verdure of the summer, man can never hope to nourish cattle. The horse, the ox, the sheep, and all our other useful animals, could never find subsistence

* The original neither runs nor bounds; but his trot equals the course of the stag. We are assured by the Savages, that he may be trotted three days and three nights without resting; *Voyage de la Hontan, tom. 1. p. 85.*

† Rangifer habitat in alpibus Europae et Asiae, maxime septentrionalibus; victitat lichene rangifero. . . . Alces habitat in borealibus Europae Asiaeque populetis; *Linn. Syst. Nat. p. 67.*

sistence there, nor be able to resist the rigours of the frost. It would have been necessary to select from the deepest forests those species of animals which are least wild and most profitable. The Laplanders have actually done what we would be obliged to do, if all our cattle were destroyed. To supply their place, it would then be necessary to tame the stags and roebucks of our woods, and to render them domestic. This end, I am persuaded, might be easily accomplished; and we would soon derive as much benefit from these animals, as the Laplanders do from their rain-deer. This example should lead us to admire the unbounded liberality of Nature. We use not one half of the treasures she presents to us; for her resources are inexhaustible. She has given us the horse, the ox, the sheep, and other domestic animals, to serve, to nourish, and to clothe us; and she has other species still in reserve, which might supply the want of the former: These we have only to subdue, and to render them subservient to our purposes. Man is equally ignorant of the powers of Nature, and of his own capacity to modify and improve her productions. Instead of making new researches, he is continually abusing the little knowledge he has acquired:

By estimating the advantages the Laplanders derive from the rain-deer, we shall find that this animal is worth two or three of our domestic animals. They use him as a horse in drawing sledges

fledges and carriages. He is so nimble and expeditious, that in one day he performs with ease a journey of thirty leagues, and runs with equal sureness on the frozen snows as upon the finest downs. The milk of the female affords a more substantial nourishment than that of the cow. The flesh of this animal is exceedingly good. His hair makes excellent furs; and his skin is convertible into a very strong and pliant leather. Thus the rain-deer alone furnishes every article we derive from the horse, the ox, and the sheep.

The manner in which the Laplanders rear and manage the rain-deer, merits particular attention. Olaus *, Scheffer †, and Regnard ‡, have given interesting details on this subject; of which the following is an abridged view. These authors tell us, that the horns of the rain-deer are much larger, and divided into a greater number of branches than those of the stag. During winter, the food of this animal is a white moss, which he knows how to find under the deepest snow, by digging with his horns, and turning it aside with his feet. In summer, he prefers the buds and leaves of trees to herbs, which the projecting branches of his horns permit him not to browse with ease. He runs on the snow, into which the breadth of his feet prevents him from sinking.

* Hist. de gentibus septent. autore Olao Magno, p. 205.

† Histoire de la Lapponie, traduite du Latin de Jean Scheffer, p. 205.

‡ Oeuvres de Regnard, tom. 1. p. 172.

sinking. These animals are extremely gentle, and are kept in flocks, which bring great profits to their owners. The milk, the skin, the sinews, the bones, the hoofs, the horns, the hair, the flesh, are all useful articles. The richest Laplanders have flocks of four or five hundred; and the poorest have ten or twelve. They are led out to pasture, and, during the night, they are shut up in inclosures, to protect them from the wolves. When carried to another climate, they soon die. Steno Prince of Sweden sent some of them to Frederic Duke of Holstein; and, more recently, in the year 1533, Gustavus King of Sweden transmitted to Prussia ten male and female rain-deer, which were let loose in the woods. They all perished without producing, either in the domestic or free state. ‘ I had a great desire,’ says M. Regnard, ‘ to carry some live rain-deer to France. This experiment has been frequently tried in vain. Last year, some of them were brought to Dantzick, where, being unable to endure the heat of that climate, they perished.’

In Lapland there are both wild and domestic rain-deer. During the rutting season, the females are let loose into the woods, where they meet with wild males; and, as the latter are stronger and more hardy than the domestic kind, the breed from this commixture is better adapted for drawing sledges. These rain-deer are not so mild as the others; for they sometimes
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not only refuse to obey their master, but turn against him, and strike him so furiously with their feet, that his only resource is to cover himself with his sledge, till the rage of the animal abates. This carriage is so light, that a Laplander can turn it with ease above himself. The bottom of it is covered with the skins of young rain-deer, the hair of which is turned backward, to make the sledge advance easily up the mountains, and prevent its recoiling. The rain-deer is yoked by means of a collar, made of a piece of skin with the hair on it, from which a trace is brought under the belly between the legs, and fixed to the fore part of the sledge. The only rein used by the Laplander is a cord tied to the root of the animal's horn, which he sometimes lays upon the one side of its back, and sometimes on the other, according as he wants it to turn to the right or the left. The rain-deer can travel, in this manner, at the rate of four or five leagues in an hour. But the quicker he goes, the motion becomes the more incommodious; and it requires much practice to be able to sit in the sledge, and to prevent it from over-turning.

Externally, the rain-deer have many things in common with the stag; and the structure of their internal parts is nearly the same*. From this natural conformity, many analogous habits and similar effects result. Like the stag, the rain-deer annually casts his horns, and is loaded
with

* Vide Rangifer, anatom. Barth. Act, 1671. No. 135.

with fat. The rutting season of both is about the end of September. The females of both species go eight months with young, and produce but one fawn. During the rutting season, the males have an equally disagreeable odour; and some of the female rain-deer, as well as the hinds, are barren †. The young rain-deer, like the fawns of the stag, are variously coloured, being first red mixed with yellow, and afterwards become of a blackish brown colour ‡. The young follow their mothers two or three years; and they acquire not their full growth till the end of the fourth year. It is at this age also that they are trained to labour. At the age of one year, they are castrated in order to make them tractable. The Laplanders perform this operation with their teeth. The uncastrated males are fierce, and very difficult to manage; and, therefore, are not used for labour. To draw their sledges, the most active and nimble geldings are selected, and the heaviest are employed in carrying provisions and baggage. One un-mutilated male is kept for every five or six females. Like the stags, they are tormented with worms, in the bad season. About the end of winter, such vast numbers are engendered under their

† Out of a hundred females, not above ten are barren, and, on account of their sterility, are called *raones*. The flesh of these is very fat and succulent in autumn; *Scheffer*, p. 204.

‡ The colour of their hair is blacker than that of the stag, The wild rain-deer are always stronger, larger, and blacker than the domestic kind; *Regnard*, tom. 1. p. 108.

their skin, that it is as full of holes as a sieve. These holes made by the worms close in summer; and it is only in autumn that the rain-deer are killed for their fur or their hide.

The flocks of rain-deer require much attention. They are apt to run off, and to assume their natural liberty. They must be followed and narrowly watched, and never allowed to pasture but in open places. When the flock is numerous, the assistance of several persons is necessary to keep them together, and to pursue those which run off. In order to distinguish them, when they wander into the woods, or mingle with other flocks, they are all marked. In fine, the time of the Laplanders is totally consumed in the management of their rain-deer, which constitute their whole riches, and they know how to derive all the conveniences, or rather the necessities of life from these animals. They are covered from head to foot with their furs, which is impenetrable either by cold or water. This is their winter habit. In summer, they use the skins from which the hair is fallen off. They likewise spin the hair, and cover the sinews they extract from the animal's body with it. These sinews serve them for ropes and thread. They eat the flesh, and drink the milk, of which last they also make very fat cheese. The milk, when churned, instead of butter, produces a kind of suet. This singularity, as well as the great extent of the horns, and the fatness of the

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the animal at the commencement of the rutting season, are strong indications of a redundance of nourishment. But we have still farther proofs that this redundance is excessive, or at least greater than in any other species; for it is peculiar to the rain-deer alone, that the female has horns as well as the male, and that, even when the males are castrated, they annually shed and renew their horns *. In the stag, the fallow-deer, and the roebuck, who have undergone this operation, the horns remain always in the same condition they were at the time of castration. Thus, of all other animals, the rain-deer affords the most conspicuous

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* *Uterque sexus cornibus est.*——Castratus quotannis cornua deponit; *Linnaeus. Syst. nat. p. 93.* It is upon the authority of Linnaeus alone that I have advanced this fact, of which I am unwilling to doubt; because, being a native of Sweden, and having travelled into Lapland, he had an opportunity of being well informed in every article regarding the rain-deer. I acknowledge, however, that the exception is singular, as in all other animals of the deer-kind, castration prevents the renewal of the horns. Besides, a positive testimony may be opposed to Linnaeus. *Castratis rangiferis Lappones utuntur Cornua castratorum non dicidunt, et cum hirsuta sunt, semper pilis luxuriant;* Hulden, Rangifer. Jenae 1697. But Hulden, perhaps, advances this fact from analogy only; and the authority of such a skillful naturalist as Linnaeus is of more weight than the testimonies of many people who are less informed. The known fact, that the female has horns like the male, is another exception which gives support to the first; and it is still further supported by the practice among the Laplanders of not cutting away the testicles, but only compressing the seminal vessels with their teeth; for, in this case, the action of the testicles, which seems necessary to the production of horns, is not totally destroyed, but only weakened.

spicuous example of redundant nutritive matter; and this effect is perhaps less owing to the nature of the animal than to the quality of his food*; for the substance of the *lichen*, or rain-deer liverwort, which is its only nourishment, especially during the winter, is similar to that of the mushroom, very nourishing, and contains a greater number of organic particles than the leaves or buds of trees †. This is the reason why the rain-deer has larger horns and a greater quantity of fat than the stag, and why the females and geldings are not deprived of horns: It is also the reason why the horns of the rain-deer are more diversified in size, figure, and number of branches, than any other of the deer kind. Those males who have never been hunted or restrained, and who feed plentifully, and at their ease, upon this substantial nourishment, have prodigious horns, which extend backward as far as their crupper, and forward beyond the muzzle. The horns of the castrated males, though smaller, often exceed those of the stag; and those of the females are still smaller. Thus the
horns

* See article *Stag*, vol. IV.

† It is remarkable that, though the rain-deer eats nothing, during winter, but great quantities of this moss, he always fattens better, his skin is cleaner, and his hair finer than when he feeds upon the best herbage, at which time they make a hideous appearance. Their being unable to endure heat, is the reason why they are better and fatter in autumn and winter, than in summer, when they have nothing but sinews, skin, and bone; *Scheffer, hist. de la Lapponie, p. 206.*

horns of the rain-deer are not only subject to variation from age, like others of the deer-kind, but from sex and castration. These differences are so great, in the horns of different individuals, that it is not surprising to see the descriptions given of them by authors so exceedingly different.

Another singularity, which is common to the rain-deer and the elk, must not be omitted. When these animals run, though not at full speed, their hoofs *, at each movement, make a crackling noise, as if all their limbs were dis-jointed. The wolves, advertised by this noise, or by the odour of the animal, throw themselves in his way, and, if numerous, they seize and kill him; for a rain-deer defends himself against the attacks of a single wolf. For this purpose he employs not his horns, which are more hurtful than useful to him, but his fore-feet, which are very strong. With these he strikes the wolf
so

Cervus angiferum culex pipiens, oestrus tarandi, tabanus tarandi ad alpes cogunt, crepitantibus unguis; *Linn. Syst. nat. p. 93.*
 —The feet of the rain-deer are shorter and much broader than those of the stag, and resemble the feet of the buffalo. The hoofs are cloven and almost round, like those of the ox. Whether he runs or goes slowly, the joints of his limbs make a great noise, like flints falling on each other, or like the breaking of nuts. This noise is heard as far as the animal can be seen; *Scheffer, p. 202.* —Fragor ac strepitus pedum, unguarumque tantus est in celeri progressu, ac si silices vel nuces collidantur; qualem strepitum articulorum etiam in alce observavi. —It is remarkable in the rain-deer, that all his bones, and particularly those of his feet, make a crackling noise, which is so loud as to be heard as far as the animal can be seen; *Regnard, tom. 1. p. 108.*

so violently as to stun him, or make him fly off; and afterwards runs with a rapidity that prevents all farther attacks. The *rosomack* or *glutton*, though not so numerous, is a more dangerous enemy. This animal is still more voracious, but not so nimble as the wolf. He pursues not the rain-deer, but lies in wait for it concealed in a tree. As soon as the rain-deer comes within his reach, he darts down upon it, fixes upon its back with his claws; and, tearing its head or neck with his teeth, he never quits his station till he has cut the animal's throat. He employs the same artifices, and carries on the same war against the elk, which is still stronger than the rain-deer*. This *rosomack* or *glutton* of the North is the same animal with the *carca-*

jou

* There is another animal, of a grayish brown colour, and about the size of a dog, which carries on a bloody war against the rain-deer. This animal, which the Swedes call *Jaert* and the Latins *Gulo*, conceals itself in the highest trees, in order to surprize its prey. When he discovers a rain-deer, whether wild or domestic, passing under the tree where he is watching, he darts down upon its back, and, fixing his claws in the neck and tail, he tears and stretches with such violence as to break the animal's back, then sinks his muzzle into its body, and drinks its blood. The skin of the jaert is very fine and beautiful, and has even been compared to that of the sable; *Oeuvres de Regnard, tom. 1. p. 154.*—
The caribou runs upon the snow almost as nimbly as upon the ground; because the broadness of its feet prevents it from sinking. The caribou, like the original, travels through the forests in winter, and is attacked in the same manner by the carcajou; *Hist. de l'Acad. des Sciences, année 1713, p. 14.*
Note. The carcajou is the same animal with the *jaert* or *glutton*.

jou or *quincajou* of North America. His combats with the orignal of Canada are famous; and, as formerly remarked, the orignal of Canada is the same with the elk of Europe. It is remarkable, that this animal, which is not larger than a badger, should kill the elk, which exceeds the size of a horse, and is so strong as to slay a wolf with a single stroke of his foot *. But the fact is attested by such a number of authorities as render it altogether unquestionable †.

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* *Lupi et ungulis et cornibus vel interimuntur vel effugantur ab alce; tanta enim vis est in ictu ungulae, ut illico tractum lupum interimat aut fodiat, quod saepius in canibus robustissimis venatores experiuntur; Olai Magni hist. de gent. septent. p. 135.*

† *Quiescentes humi et erecti stantes onagri maximi a minima quandoque mustela guttur insiliente mordentur, ut sanguine decurrente illico deficient morituri. Adeo insatiabilis est haec bestiola in cruore sugendo, ut vix similem suae quantitatis habeat in omnibus creaturis; Olai Magni hist. de gent. sept. p. 134. Note. 1. That Olaus, by the word *onager*, often means the *elk*; 2. That, with much impropriety, he compares the *gutton* to a small weasel; for this animal is larger than a badger.—The quincajou climbs trees, and, concealing himself among the branches, waits the approach of the orignal. When any of these animals comes under the tree, the quincajou darts down upon its back, fixes his claws in its throat and rump, and then tears the creature's neck, a little below the ears, till it falls down; *Descript. de l'Amerique Septentrionale, par Denys, p. 329.*—The carcajou attacks and kills the orignal and caribou. In winter, the orignal frequents those districts where the *anagyris foetida*, or stinking bean trefoil, abounds; because he feeds upon it; and, when the ground is covered with five or six feet of snow, he makes roads through these districts, which he never abandons, unless when pursued by the hunters. The carcajou, observing the route*

The elk and the rain-deer are both ruminating animals, as appears from their manner of feeding, and the structure of their intestines *; yet Tornaëus Scheffer †, Regnard ‡, Hulden §, and several other authors, have maintained that the rain-deer does not ruminate. Ray ||, with much propriety, considers this opinion as incredible; and, in fact, the rain-deer ** chews the cud as well as all other animals which have many stomachs. The duration of life, in the domestic rain-deer, exceeds not fifteen or sixteen years,

route of the original, climbs a tree near a place where it must pass, darts upon it, and cut its throat in a moment. In vain the original lies down on the ground, or rubs himself against the trees; for nothing can make the carcajou quit his hold. The hunters have found pieces of his skin, as large as a man's hand, sticking on the tree against which the original had dashed him; *Hist. de l'Acad. des Sciences, années, 1707, p. 13.*

* The elk, in its internal parts, and particularly in its bowels, and four stomachs, has a considerable resemblance to the ox; *Mem. pour servir à l'histoire des animaux, part. I. p. 184.*

† It is remarkable, that, though the rain-deer is cloven footed, he does not ruminate; *Scheffer, p. 200.*

‡ Regnard makes the same observation, tom. 1, p. 109.

§ Sunt bifulci et cornigeri, attamen non ruminant Rangiferi; *Hulden, Rangiferi, &c.*

|| Profecto (inquit Peyerus) mirum videtur animal illud tam insigniter cornutum, ac praeterea bifulcum, cervisque specie simillimum, ruminatione destitui, ut dignum censeam argumentum altiore indagine curiosorum, quibus Renones fors subministrat aut principum favor. *Hactenus Peyerus; mihi certe non mirum tantum videtur, sed plane incredibile; Raii synops. quad. p. 89.*

** Rangifer ruminat aequè ac aliae species sui generis; *Linn. Faun. Suecica, p. 14.*

years *. But it is probable, that, in a wild state, he lives much longer; for, as he is four years in acquiring his full growth, he ought, when in his natural state, to live twenty-eight or thirty years. The Laplanders employ different methods of hunting the wild rain-deer, corresponding to the difference of seasons. In the rutting time, they use domestic females to attract wild males †. They shoot these animals with muskets or with bows, and they let fly their arrows with such violence, that, notwithstanding the great thickness and strength of their skin, one is generally fatal.

We have collected the facts relating to the history of the rain-deer with the more care and circumspection,

* *Ætas ad tredecim vel ultra quindecim annos non excedit in domesticis; Hulten. Ætas sexdecim annorum; Linn. syst. nat. p. 67.*—Those rain-deer which escape all misfortunes and diseases, seldom live above thirteen years; *Scheffer, p. 209.*

† The Laplanders hunt the rain-deer with nets, halberds, arrows, and muskets. The hunting seasons are autumn and spring. In autumn, when the rain-deer are in season, the Laplanders go to those places of the forests which they know the wild males frequent, and there tie domestic females to the trees. The female attracts the male, and, when he is at the point of covering her, the hunter shoots him with a bullet or an arrow.—In spring, when the snow begins to melt, and those animals are embarrassed by sinking in it, the Laplander, shod with his rackets, pursues and overtakes them.—At other times, they are chased into snares by dogs. In fine, a kind of nets are employed, which are composed of stakes wattle together in the form of two hedges, with an alley between them of perhaps two leagues in length. When the rain-deer are pushed into this alley, they run forward and fall into a large ditch made with that view at the end of it; *Scheffer, p. 209.*

circumspection, because it was not possible for us to procure the live animal. Having expressed my regret on this subject to some of my friends, Mr Collinson, member of the royal society of London, a man as respectable for his virtues as for his literary merit, was so obliging as to send me a drawing of the skeleton of a rain-deer; and I received from Canada a foetus of a caribou. By means of these two, and of several horns which were transmitted to us from different places, we have been enabled to mark the general resemblances and principal differences between the rain-deer and the stag.

With regard to the elk, I saw one alive about fifteen years ago. But, as it continued only a few days in Paris, I had not sufficient time to have the drawing completed; and, therefore, I was obliged to content myself with examining the description formerly given of this animal by the gentlemen of the academy, and to be satisfied that it was exact, and perfectly conformable to nature.

‘ The elk,’ says the digester of the Memoirs of the Academy *, ‘ is remarkable for the length
 ‘ of its hair, the largeness of its ears, the small-
 ‘ ness of its tail, and the form of its eye, the
 ‘ largest angle of which is much split, as well
 ‘ as the mouth, which is much larger than that
 ‘ of the ox, the stag, or other cloven footed a-
 ‘ nimals.

* Mem pour servir à l’histoire des animaux, part 1. p. 178.

' nimals. The elk which we dissected
 ' was nearly of the size of a stag. The length
 ' of the body was five feet and a half from
 ' the end of the muzzle to the origin of the
 ' tail, which was only two inches long. Be-
 ' ing a female, it had no horns; and its neck
 ' was only nine inches in length, and as much
 ' in breadth. The ears were nine inches long
 ' by four broad. The colour of the hair
 ' was not much different from that of the afs,
 ' the gray colour of which sometimes approaches
 ' to that of the camel. In other respects,
 ' this hair differed greatly from that of the afs,
 ' which is shorter, and from that of the camel,
 ' which is much finer. The length of the hair
 ' was three inches, and equalled in thickness
 ' the coarsest hair of a horse. This thickness
 ' diminished gradually toward the extremity,
 ' which was very sharp: It diminished like-
 ' wise toward the root, but suddenly became
 ' like the handle of a lancet. This handle was
 ' of a different colour from the rest of the hair,
 ' being white and diaphanous, like the bristles
 ' of a hog. The hair was as long as that
 ' of a bear, but straighter, thicker, smoother,
 ' and all of the same kind. The upper lip was
 ' large and detached from the gums, but by no
 ' means so large as Solinus described it, nor as
 ' Pliny has represented the animal he calls
 ' *machlis*. These authors tell us, that this crea-
 ' ture is obliged to go backward when he pas-
 ' tures, to prevent his lip from being entangled

‘ between his teeth. We remarked, in the dis-
 ‘ section, that Nature had provided against this
 ‘ inconveniency by the largeness and strength
 ‘ of the muscles destined to raise the upper lip.
 ‘ We likewise found the articulations of the legs
 ‘ closely embraced by ligaments, the hardness
 ‘ and thickness of which might give rise to the
 ‘ opinion, that the *alce*, after lying down, was
 ‘ unable to raise himself. . . . His feet were
 ‘ similar to those of the stag; only they were
 ‘ larger, and had no other peculiarity.
 ‘ We remarked, that the large angle of the eye
 ‘ was much more slit below than in the stag,
 ‘ the fallow deer, and the roebuck: It is sin-
 ‘ gular, that this slit was not in the direction
 ‘ of the opening of the eye, but made an angle
 ‘ with the line which goes from the one corner
 ‘ of the eye to the other; the inferior lachrymal
 ‘ gland was an inch and a half long, by seven
 ‘ lines broad. In the brain we found
 ‘ a part whose magnitude seemed to point out
 ‘ some relation to the sense of smelling, which,
 ‘ according to Pausanias, is more exquisite in the
 ‘ elk than in any other animal; for the olfac-
 ‘ tory nerves, commonly called the *mammillary*
 ‘ *processes*, were incomparably larger than in
 ‘ any other animal we ever dissected, being
 ‘ more than four lines in diameter. With
 ‘ regard to the lump of flesh which some au-
 ‘ thors have placed on his back, and others un-
 ‘ der his chin, if they have not been deceived

‘ or too credulous, it must be peculiar to the elks ‘ they mention.’ We can add our testimony to that of the gentlemen of the Academy ; for, in the female elk we had alive, there was no bunch either under the chin, or on the neck. Linnaeus, however, as he lives in the country inhabited by elks, and ought to have a more complete knowledge of them than we can pretend to, mentions this bunch on the neck, and even makes it an essential character of the elk : *Alces, cervus cornibus acaulibus palmatis, caruncula gutturali* ; *Linn. Syst. Nat. p. 92.* There is no other method of reconciling the assertion of Linnaeus with our negative evidence, but by supposing this bunch, *guttural caruncle*, to be peculiar to the male, which we have never seen. But, though this were the case, Linnaeus ought not to have made it an essential character of the species, since it exists not in the female. This bunch may likewise be a disease, a kind of wen, common among the elks ; for, in Gefner’s * two figures of this animal, the first, which wants horns, has a large fleshy bunch on the throat ; and, in the second, which represents a male with his horns, there is no bunch.

In general, the elk is much larger and stronger than the stag or rain-deer †. His hair is so rough,

* Gefner, *hist. quad.* p. 1. & 3.

† The elk exceeds the rain-deer in magnitude, being equal to the largest horse. Besides, the horns of the elk are much shorter, about two palms broad, and have very few branches,

rough, and his skin so hard, that it is hardly penetrable by a musket ball *. His limbs are extremely firm, and possess such agility and strength, that, with the single blow of his fore-feet, he can slay a man, or a wolf, and even break a tree. He is hunted, however, by men and dogs, in the same manner as the stag. We are assured, that, when pursued, he often falls down suddenly †, without being either shot or wounded.

His feet, especially those before, are not round, but long, and he strikes with them so furiously as to kill both men and dogs. Neither does he more resemble the rein-deer in the form of his head, which is longer, and his lips are large and pendulous. His colour is, not so white as that of the rein-deer, but, over the whole body, it is an obscure yellow, mixed with a cinereous gray. When he moves, he makes no noise with his joints, which is common to all rein-deer. In fine, whoever examines both animals, as I have often done, will remark so many differences, that he will have reason to be surprised how any man should regard them as the same species; *Scheffer*, p. 310.

* *Alces ungula ferit, quinquaginta milliaria de die percurrit, corium globum plumbeum fere eludit; Linn. Syst. Nat. p. 93.*

† We had not advanced a pistol-shot into the wood, when we descried an elk, which, when running before us, suddenly dropped down, without being so much as fired at. We asked our guide and interpreter how the animal came to fall in this manner. He replied, that it was the falling sickness, to which these animals are subject, and assigned that as the reason of their being named *ellends*, which signifies *miserable* . . . If this disease did not often bring them down, it would be difficult to seize them. The Norwegian gentleman killed this elk while it was under the influence of its disease. We pursued another two hours, and would never have taken him, if he had not, like the first, fallen down, after having killed three strong dogs with his fore-feet. . . . This gentleman present-

wounded. From this circumstance it has been presumed that the animal is subject to the epilepsy; and from this presumption (which is not well founded, since fear might produce the same effect) the absurd conclusion has been drawn, that his hoofs have the power of curing, and even preventing, the falling sickness. This gross prejudice has been so generally diffused, that many people still carry pieces of the elk's hoof in the collets of their rings.

As the northern parts of America are very thinly inhabited, all the animals, and particularly the elks, are more numerous there than in the North of Europe. The Savages are not ignorant of the art of hunting and seizing the elks*. They sometimes follow the tract of these animals for several days, and, by mere perseverance and address, accomplish their purpose. Their mode of hunting in winter is particularly singular. 'They use,' says Denys, 'rackets, by means of which they walk on the snow without sinking. . . . The original does not make much way, because he sinks in the snow, which fatigues him. He eats

ed me with the left hind feet of the elks he had killed, and told me they were a sovereign remedy against the falling sickness. To which I answered, smiling, that, since this foot had so much virtue, I was surpris'd that the animal to which it belonged should ever be afflicted with the disease. The gentleman likewise laughed, and said that I was right; that he had seen it administered without effect to many people who were troubled with the epilepsy; and that he knew, as well as I did, that it was a vulgar error; *Voyage de la Martiniere*, p. 10.

* Descript. de l'Amerique, par Denys, tom. 2. p. 425.

‘ eats only the annual shoots of trees. Where
 ‘ the Savages find the wood eaten in this man-
 ‘ ner, they soon meet with the animals, which
 ‘ are never very distant, and are easily taken,
 ‘ because they cannot run expeditiously. They
 ‘ throw darts at them, which consist of large
 ‘ staves, pointed with a bone, which pierces like
 ‘ a sword. When there are many originals in a
 ‘ flock, the Savages put them to flight. The
 ‘ originals, in this case, march at one another’s
 ‘ tails, and make a circle sometimes of more
 ‘ than two leagues, and, by their frequent turn-
 ‘ ing round, tread the snow so hard, that they
 ‘ no longer sink in it. The Savages lie in am-
 ‘ buscade, and kill the animals with darts as they
 ‘ pass.’ From comparing this relation with those
 already quoted, it is apparent, that the American
 Savage and the original are exact copies of the
 European Laplander and the elk.

S U P P L E M E N T.

*Addition to the article Elk and Rain-deer, by
 Professor Allamand.*

M. de Buffon is of opinion, that the European
 elk is likewise found in North America under
 the appellation of *Original*. If any difference
 exists, it consists in magnitude only, which varies

ries in proportion to climate and food. It is not even ascertained which of them are largest. M. de Buffon thinks that those of Europe are larger than those of America, because all the animals of the New Continent are smaller than those of the Old. Most voyagers, however, represent the original as exceeding the elk in magnitude. Mr Dudley, who sent an accurate description of an original to the Royal Society, says, that the hunters killed one which was more than ten feet high *. This stature would be necessary to enable the animal to carry its enormous horns, which weigh one hundred and fifty, and, if we believe La Hontan, three or four hundred pounds.

The Duke of Richmond, who delights in collecting, for public utility, every thing that can contribute to improve the arts, or augment our knowledge of Nature, has a female original in one of his parks, which was conveyed to him by General Carleton, Governour of Canada, in the year 1766. It was then only one year old, and it lived nine or ten months. Some time before it died, he caused an exact drawing of it to be made, which he obligingly sent to me, and of which I have given an engraving as a supplement to M. de Buffon's work. As this female was very young, it exceeded not five feet in height. The colour of the upper part of the body was a deep brown, and that of the under part was brighter,

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I received from Canada the head of a female original which was more advanced in years. Its length, from the end of the muzzle to the ears, is two feet three inches. Its circumference at the ears is two feet eight inches, and, near the mouth, one foot ten inches. The ears are nine inches long. But, as this head is dried, these dimensions must be smaller than when the animal was alive.

M. de Buffon is likewise of opinion, that the caribou of America is the rain-deer of Lapland; and the reasons with which he supports this idea have much weight. I have given a figure of the rain-deer, which is wanting in the Paris edition. It is a copy of that which was published by Ridinger, a famous painter and engraver, who drew it from the life. I have likewise been obliged to the Duke of Richmond for a drawing of the American caribou. This animal was sent to him from Canada, and it lived a long time in his park. His horns were only beginning to shoot when the figure was drawn; and it is the only true representation we have of the animal. By comparing it with the rain-deer, there appears, at first sight, to be a very considerable difference between the two figures; but the want of horns in the caribou greatly changes its aspect.

Addition by the Count de Buffon.

I here give an engraving of a female rain-deer, drawn from a living female in the possession of the Prince of Condé. It was sent to him by the King of Sweden, along with two males, one of which died on the road, and the other lived only a short time after its arrival in France. The female resisted the effects of the climate for a considerable time. She was of the size of a hind; but her legs were shorter and her body thicker. Her horns, like those of the male, were divided into antlers, some of which pointed forward, and others backward. But they were shorter than those of the males. The following description of this animal was communicated to me by M. de Sève.

‘ The length of the whole body, from the
 ‘ muzzle to the anus, in a superficial line, is five
 ‘ feet one inch. The height of the withers is
 ‘ two feet eleven inches, and that of the crup-
 ‘ per two feet eleven inches nine lines. The
 ‘ hair is thick and close, like that of the stag,
 ‘ the shortest on the body being an inch and
 ‘ three lines in length. It is longer on the belly,
 ‘ very short on the limbs, and very long about
 ‘ the fetlock. The colour of the hair which
 ‘ covers the body is a reddish brown, more or
 ‘ VOL. VI. Y y less

‘ less deep in different parts, and sprinkled with
 ‘ a kind of yellowish white. Upon part of the
 ‘ back, the thighs, the top of the head, and
 ‘ chanfrin, the hair is deeper coloured, especi-
 ‘ ally above the eye-pits, which the rain-deer
 ‘ has as well as the stag. The circumference
 ‘ of the eye is black. The muzzle is a deep
 ‘ brown, and the circumference of the nostrils
 ‘ is black. The point of the muzzle, as far as
 ‘ the nostrils, as well as the end of the under
 ‘ jaw, are of a bright white colour. The ear is
 ‘ covered above with thick white hair, approach-
 ‘ ing to yellow, and mixed with brown. The
 ‘ inside of the ear is adorned with large white
 ‘ hairs. The neck and upper part of the body,
 ‘ as well as the large hairs which hang on the
 ‘ breast below the neck, are of a yellowish
 ‘ white colour. Upon the sides, above the
 ‘ belly, there is a large band, as in the gazelle.
 ‘ The limbs are slender in proportion to the
 ‘ body; and they, as well as the thighs, are of
 ‘ a deep brown, and of a dirty white colour on
 ‘ the inside. The ends of the hairs which co-
 ‘ ver the hoofs are likewise of a dirty white.
 ‘ The feet are cloven, like those of the stag.
 ‘ The two fore toes are broad and thin: The
 ‘ small ones behind are long, pretty thin, and
 ‘ flat on the inside. They are all extremely
 ‘ black.’

By the figure I have given, no judgment must
 be formed of the length and thickness of the
 rain-

rain-deer's horns, some of which extend backward from the head as far as the crupper, and project forward in antlers of more than a foot long. The large fossil horns found in different places, and particularly in Ireland, appear to have belonged to the rain-deer species. Mr Colinson informed me that he had seen some of these fossil horns with an interval of ten feet between their extremities, and with brow-antlers, like those of the rain-deer.

It is to this species, therefore, and not to that of the elk, that the fossil bones of the animal called *mouje-deer* by the British are to be referred. We must acknowledge, however, that no rain-deer now exist of such magnitude and strength as to carry horns so long and massy as those found in a fossil state in Ireland, as well as in several other parts of Europe, and even in North America*.

Besides, I knew only one species of rain-deer, to which I referred the caribou of America, and the Greenland fallow-deer, described and engraven by Mr Edwards: And, it is not long since I was informed, that there were two species, or rather two varieties, the one much larger than the other. The rain-deer, of which I have given a figure, is the small kind, and probably the same

* In North America, we find horns which must have belonged to an animal of a prodigious magnitude. Similar horns are found in Ireland. They are branched, &c.; *Voyage de P. Kalm, tom. 2. p. 435.*

same with the Greenland fallow-deer of Mr Edwards.

Some travellers tell us, that the rain-deer is the fallow-deer of the North; that, in Greenland, it is wild; and that the largest of them exceed not the size of a two-year old heifer*.

Pontoppidan assures us, that the rain-deer perish in every part of the world, except the northern regions, where they are even obliged to inhabit the mountains. He is less to be credited when he tells us, that their horns are moveable; that the animal can turn them either forward or backward; and that, above the eye-lids, there is a small aperture in the skin, through which he sees, when the snow prevents him from opening his eyes. This last fact appears to be imaginary, and borrowed from a practice of the Laplanders, who cover their eyes with a piece of split wood, to avoid the great splendour of the snow, which renders them blind in a few years, if this precaution is neglected †.

It is remarkable, that these animals, in all their movements, make a crackling noise: Independent of running, even when surprised or touched, this noise is heard. I have been assured that the same thing happens to the elk; but I cannot ascertain the truth of this assertion.

Observations

* Hist. gen. des voyages, tom. 19. p. 37.

† Pontoppidan's Nat. Hist. of Norway.

Observations on the Rain-deer, by Professor Camper of Groningen.

The rain-deer sent to me from Lapland by the way of Drontheim and Amsterdam, arrived at Groningen the 21st day of June 1771. It was very feeble, not only on account of the heat of the climate and the fatigue of the voyage, but chiefly from an ulcer between the second stomach and the diaphragm, of which it died the next day. While it lived, it eat, with appetite, grafs, bread, and other things presented to it, and likewise drank pretty copiously. It did not die for want of nourishment; for, upon dissection, I found all its stomachs full. Its death was slow, and accompanied with convulsions.

It was a male of four years old. In all the bones of the skeleton, there were epiphyses, which proves that it had not yet acquired its full growth, which happens not till five years of age. Hence this animal may live at least twenty years.

The colour of the body was brown, mixed with black, yellow, and white. The hairs on the belly, and particularly on the flanks, were white, and brown at the points, as in other deer. The hair on the limbs was a deep yellow; and that on the head inclined to black. The hair on the flanks, as well as on the neck and breast, was long and bushy.

The

The hair which covered the body was so brittle, that, when slightly pulled, it broke transversely. It lay in an undulated form, and its substance resembled the pith of rushes. The brittle part of it was white. The hair on the head and the under part of the legs, as far as the hoofs, had not this fragility, but, on the contrary, was as strong as that of a cow.

The coronet of the hoofs was covered on all sides with very long hair. Between the toes of the hind feet there was a broad pellicle, composed of the skin which covers the body, but interspersed with small glands.

In the hind feet, at the height of the coronets, a kind of canal, sufficient to admit a goose quill, and filled with very long hairs, penetrated as far as the articulation of the canon with the small bones of the toes. I discovered no such canal in the fore feet; neither do I know the use of it.

The figure of this animal differed much from that described by other authors, because it was extremely emaciated. The length of the body, from the muzzle to the anus, was five feet, and its height before three feet.

The eyes differ not from those of the fallow-deer or stag. The pupil is transverse; and the iris is brown, inclining to black. The eye-pits resemble those of the stag, and are filled with a whitish, resinous, and somewhat transparent matter. As in the fallow-deer, there are two lachrymal ducts and canals. The upper eye-
lid

lid has very long, black *cilia*. It is not perforated, as some authors have fancied, but entire. The Bishop of Pontoppidan, and, upon his authority, M. Haller, have attempted to account for this supposed perforation: They thought it necessary, in a country perpetually covered with snow, to defend the animal's eyes against the excessive glare of reflected light. Man, who is destined to live in all climates, prevents blindness as much as possible by veils, or small perforated machines, which weaken the splendour of the light. The rain-deer, who is made for this climate alone, has no occasion for such mechanism. But he is furnished with a nictitating membrane, or an internal eye-lid, like the birds, and some other quadrupeds. Neither is this membrane perforated: It is capable of covering the whole cornea.

The nose of the rain-deer is very large, like that of the cow; and the muzzle is more or less flat, and covered with long grayish hair, which extends to the internal part of the nostril. The lips are likewise covered with hair, except a small border, which is blackish, hard, and very porous. The nostrils are very distant from each other. The under lip is narrow, and the mouth deep cut, as in the sheep.

He has eight cutting teeth in the under jaw; but they are very small, and loosely fixed. Like the other ruminating animals, he has no cutting teeth in the upper jaw. But I thought I perceived

ceived tusks, though they had not yet pierced the gums; and I observed no such appearance in the under jaw. Horses have tusks in both jaws; but mares seldom have any. The fallow-deer, both males and females, seldom or never have tusks. But I lately procured the head of a hind recently brought forth, which had a large tusk in the left side of the upper jaw: Nature is so various in this article, that no constant rule can be established. There are six grinders in each side of both jaws, or twenty-four in all.

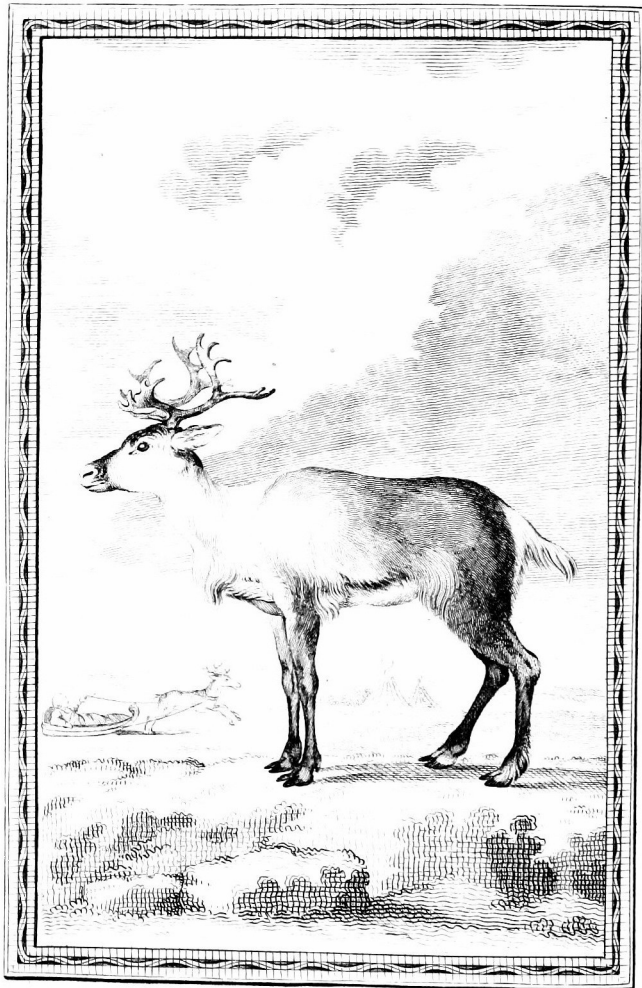
I have nothing to remark concerning the horns; for they were only beginning to shoot: One of them was an inch and the other an inch and a half high. Their base was situated nearer the occiput than the orbit of the eye. The hair which covered them was beautifully turned, and of a gray colour, inclining to black. In viewing the two shoots at a distance, they had the appearance of two large mice sitting on the animal's head.

The neck is short, and more arched than that of the sheep, but less than that of the camel. The body seemed to be naturally robust. The back is a little elevated toward the shoulders, and pretty straight every where else, though the vertebrae are somewhat arched.

The tail is very small, bent downward, and garnished with long bushy hair.

The testicles are very small, and appear not without the body. The penis is not large.

The



J. Bell Sculp.

FEMALE RAIN-DEER.

The prepuce is naked, like a navel, full of wrinkles in the inside, and covered with a calcareous crust.

The hoofs are large, long, and convex on the outside. The spurs are also very long, and some of them touch the ground when the animal stands. They were hollow, probably because he makes no use of them.

The intestines were exactly similar to those of the fallow-deer. There was no gall-bladder. The kidneys were smooth, and undivided. The lungs and wind-pipe were very large.

The heart was of a middle size, and, like that of the fallow-deer, contained only one small bone. This bone supported the base of the femilunar valve of the aorta, which is opposed to two others, from which the coronary arteries of the heart derive their origin. It likewise gives firmness to the membranous partition between the two cavities of the heart, and to the triglochine valve of the right ventricle.

In this animal there is a singular pouch, very large, membranous, and situated under the skin of the neck. It begins by a conical canal between the os hyoides and the thyroide cartilage. This canal gradually enlarges, and is changed into a kind of membranous sac, supported by two oblong muscles, which derive their origin from the inferior part of the os hyoides, precisely where the base, the pisiform bone, and the cornua unite.

This pouch opens into the larynx, under the root of the epiglottis, by a large orifice, which easily admitted my finger.

When the animal pushed the air forcibly out of the lungs, as in lowing, the air passed into this pouch, swelled it, and necessarily produced a considerable tumour, which greatly changed the sound. The two muscles drive the air out of the pouch, when the animal ceases its lowing.

About twenty years ago, I showed a similar pouch in several baboons and monkeys; and, the year following, I demonstrated to my pupils, that there was a double pouch in the Ourang-outang.

The WILD GOAT*, the CHAMOIS GOAT**, and other Goats.

THE Greeks, it is probable, were acquainted with the wild and chamois goats. But they have neither pointed out these animals by particular denominations, nor by characters so precise,

* The wild goat has large knotted horns, reclining backward, and a very small head. On the chin of the male there is a dusky beard; the rest of the hair is tawny, mixed with ash-colour. The females are less, and have smaller horns, more like those of the common she-goat, and have few knobs on the upper surface. They bring one young, seldom two, at a time; *Pennant's Synopsis of quad. p. 13.*

In French, *Bouquetin, Bouc estain, Boucstein*; that is, *rock goat*, *Stein* denoting *rock* in the Teutonic language; in Latin *Ibex*; in German and Swiſs, *Steinbock*.

Ibex, Plinii lib. 8. c. 53. Gefner. quad. p. 303. Raii Synopsis. quad. p. 77. Brisson, quad. p. 39.

Bouc estain; Belon, obs. p. 14.

Bouc Savage; Gaston de Foix, p. 99.

Capricorne; Munster, Cosmog. p. 381.

Steinbock; Kram. Aust. p. 321.

Capra Ibex, cornibus supra nodosis, in dorsum reclinatis, gula barbata; Linn. Syst. Nat. p. 95. Klein. quad. p. 16.

** The chamois goat has slender, black, upright horns, hooked at the end. Behind each ear there is a large orifice in the skin. The forehead is white, and along the cheeks there is a dusky bar. The rest of the body is of a deep brown colour. The tail is short; the hoofs are long and much divided; *Pennant's Synopsis of quad. p. 17.*

In Latin *Rupicapra*; in Italian, *Camuza*; in German, *Gemſſ*; in old French, *Yſard, Yſarus, Sarris.*

Chamois,

precise, as to enable us to distinguish them. They have denominated them, in general, *wild goats* *. They perhaps regarded these animals as of the same species with the domestic kind †, having never bestowed on them proper names, as they have done to every other species of quadruped. Our modern naturalists, on the contrary, have considered the wild and the chamois goats as two distinct species, and both different from the common goat. There are facts and arguments in favour of both opinions, of which we shall only give a detail, till we learn from experience whether these animals can intermix together, and produce fertile individuals; as this circumstance alone can determine the question.

The

Chamois, Cemas, Ysard; Obs. de Belon. p. 54. Belon pretends that the French name *Chamois* comes from the Greek *Cemas* of Ælian; but he is not certain that *Cemas*, or rather *Kemas*, denoted the Chamois; See *Mem. pour servir à l'hist. des animaux, part. 1. p. 205.*

Rupicapra; *Plinii, lib. 8. c. 15. Gesner, quad. p. 290. Raii Synops. quad. p. 78. Scheut. It. Alp. tom. 1. p. 155.*

Ysarus on Sarris; *Gaston de Foix, p. 99. Brisson. quad. p. 41.*

Gemse; *Klein, quad. p. 18.*

Antilope rupicapra; *Pallas Miscel. p. 4.*

Capra rupicapra, cornibus erectis uncinatis; *Linn. Syst. Nat. p. 95.*

* *Rupicapras inter capras sylvestres adnumerare libet, quoniam hoc nomen apud solum Plinium legimus, et apud Græcos simpliciter seræ caprae dicuntur, ut conjicio: Nam et magnitudine et figura tum cornuum tum figura corporis ad villaticas proxime accedunt*; *Gesner. hist. quad. p. 292.*

† *Caprae quas alimus, a capris feris sunt ortae a quibus propter Italiam, Capraria insula est nominata, Varro.*

The male wild goat differs from the chamois in the length, thickness, and figure of his horns. His body is also larger, and he is more vigorous and strong. The horns of the female wild goat are smaller than those of the male, and have a great resemblance to those of the chamois*. Besides, the manners and dispositions of these two animals are the same, and they inhabit the same climate; only the wild goat, being stronger and more agile, goes to the summits of the highest mountains, while the chamois never rises higher than the second stage †. But neither of them are found in the plains. Both of them clear roads in the snow, and leap from one precipice to another. Both are covered with a firm, solid skin, and clothed, in winter, with a double fur, the external hair being coarse, and the internal finer and more bushy ‡. Both of them have a black band on the back, and tails of nearly

* *Foemina in hoc genere mare suo minor est, minusque fusca, major Capra villatica, Rupicaprae non adeo dissimilis: Cornua ei parva, et ea quoque Rupicaprae aut vulgaris caprae cornibus fere similia; Stumpf;us apud Gesner, p. 305.*

† *Rupes montium colunt Rupicaprae, non summas tamen ut Ibex, neque tam alte et longe saliant; descendunt aliquando ad inferiora Alpium juga; Gesner, Hist. quad. p. 292.*

‡ The chamois goat has longer legs than the domestic kind; but his hair is shorter. That which covers the belly and thighs is the longest, and exceeds not four inches and a half. On the back and flanks the hair is of two kinds; for, as in the beaver, beside the long external hair, there is a very short, fine hair, concealed round the roots of the longer kind. The head, the belly, and the legs, were covered with coarse hair only; *Mem. pour servir a l'hist. des Animaux, part. 1. p. 203.*

ly an equal size. The number of external resemblances is so great, and the conformity of the internal parts is so complete, that we would be induced to conclude, that these two animals are not only simple, but permanent varieties of the same species. Besides, the wild, as well as the chamois goats *, when taken young, and reared along with the domestic kind, are easily tamed, assume the same manners, go in flocks, return to the same fold, and probably couple and produce together. I acknowledge, however, that this last fact, which is the most important of all, and would alone decide the question, is by no means established. We have never been able, with certainty, to learn whether the wild and chamois goats produce with the common kind †. We only suspect this to be the case. In this respect, we agree with the antients; and, besides, our
conjecture

* The inhabitants of the island of Crete might take the young of the bouc-estain (of which there are great quantities) wandering in the mountains, and feed and tame them along with the domestic kind. . . . They are covered with yellow hair. When old, they become gray, and a black line runs along the spine of the back. We have some of them in the mountains of France, and chiefly in places full of precipices, and of difficult access. . . . The bouc-estain leaps from one rock to another, at the distance of six fathoms, an exertion almost incredible to those who have not seen it; *Observ. de Belon, p. 14.*—Audio Rupicapras aliquando cicurari; *Gesner, de quad. p. 292.*—Vaslesii ibicem in prima aetate captam omnino cicurari, et cum villaticis capris ad pascua ire et redire, aiunt; progressu tamen aetatis ferum ingenium non profus exuere; *Stumpfius apud Gesner, Hist. quad. p. 305.*

† In the compilation of natural history made by Mess. Arnault de Nobleville and Salerne, it is said, (tom. 4. p. 264.)
that

conjecture seems to be founded on strong analogies, which are seldom contradicted by experience.

Let us, however, consider the opposite arguments. The wild and chamois goats both subsist in the state of nature, and yet they always remain distinct. The chamois sometimes mingles spontaneously with the flocks of the domestic kind *; but the wild goat never associates with them, unless when tamed. The male wild goat and the common he-goat have very long beards, and the chamois has none. The horns of the male and female chamois are small: Those of the wild he-goat are so large and so long †, that
we

that the chamois goats are in season during almost the whole month of September; that the females go with young nine months; and that they generally bring forth in June. If these facts were true, they would demonstrate that the chamois is not the same species with the goat, which goes with young about six months only: But I think they are suspicious, if not false. The hunters, as appears from the passages already quoted, assure us, on the contrary, that the chamois and wild goats do not come in season till the month of November; and that the females bring forth in May. Thus the time of gestation, instead of being extended to nine months, should be reduced to near five, as in the domestic goat. But this matter must be decided by experience alone.

* *Rupicaprae aliquando accedunt usque ad greges caprarum vicurum quos non refugiant, quod non faciunt ibices; Gesner, Hist. quad. p. 292.*

† *Ibex egregium ut et corpulentum animal, specie fere cervina minus tamen, cruribus quidem gracilibus et capite parvo cervum exprimit. Pulchros et splendidos oculos habet. Color pellis fuscus est. Ungulae bisulcae et acutae ut in rupicapris; cornua magni ponderis ei reclinantur ad dorsum, aspera et nodosa, eoque magis quo grandior aetas processerit; argentur*

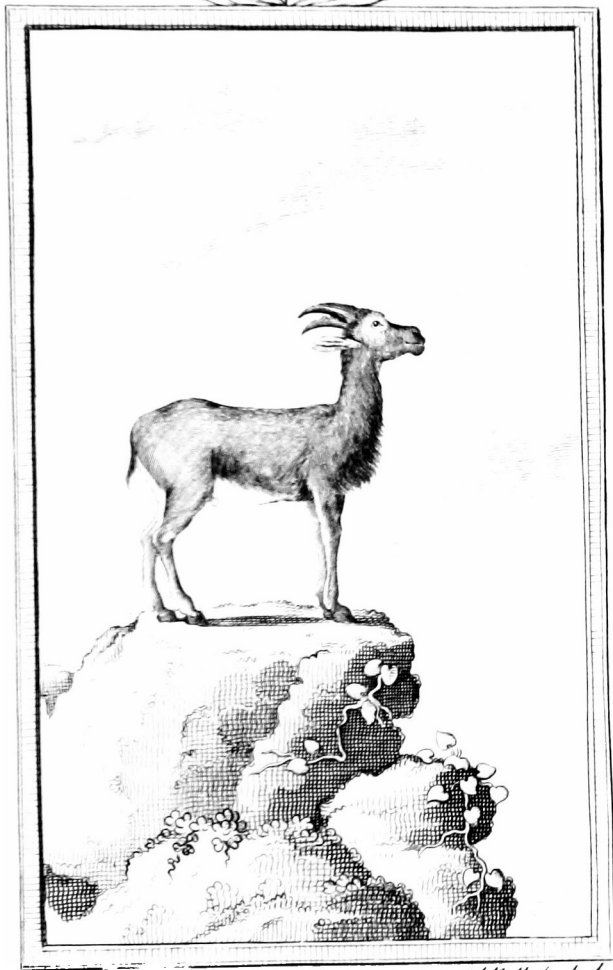
we could hardly imagine they belonged to an animal of his size. The chamois seems to differ from the wild goat, and the common he-goat, by the direction of his horns, which incline a little forward in their inferior part, and bend backward at the point like a hook. But, as we remarked in the history of the ox and sheep, the horns of domestic animals, as well as those of wild animals living in different climates, vary prodigiously. The horns of our female goat are not entirely similar to those of the males. The horns of the male wild goat are not very different from those of our he-goat: And, as the female wild goat approaches the domestic kind, and even the chamois, in size, and in the smallness of its horns, may we not conclude, that the males of the wild, chamois, and domestic goats, are only one species of animal, in which the nature of the females is constant and similar among themselves, but that the males are subject to considerable variations? In this point of view, which is not, perhaps, removed so far from nature as may be imagined, the wild goat would be the original male stock, and the chamois would be the female *. I say, that this point

of

augentur enim quotannis donec jam vetulis tandem nodi circiter viginti increverint. Bina cornua ultimi incrementi ad pondus sedecim aut octodecim librarum accedunt. . . . Hex saliendo rupicapram longe superat; hoc tantum valet ut nisi qui viderit vix credat; *Stumpsius apud Gesner, p. 305.*

* The want of a beard in the chamois is a female character, which ought to be added to the others. The male chamois

mois



C. Bell sculp.

WILD-GOAT.

of view is not imaginary, since we can prove from experience, that there are animals in nature, in which the female can equally serve males of different species, and produce from them both. The sheep produces with the he-goat as well as with the ram, and always brings forth lambs which are individuals of its own species. The ram, on the contrary, produces not with the she-goat. The sheep, therefore, may be regarded as a female common to two different males; and, consequently, she constitutes a species independent of the male. The same thing will happen to the wild goat. The female alone represents the primitive species, because her nature is constant. The males, on the contrary, vary; and it is extremely probable, that the domestic she-goat, which may be considered as the same female as those of the wild and chamois kinds, would produce equally with these three different males, which alone admit of varieties in species; and, consequently, though they seem to change the unity, alter not the identity of the species.

These, as well as all other possible relations, must necessarily exist in nature. It even appears, that the females contribute more to the support of the species than the males; for, though both concur in the first formation of the

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A a a

foetus,

chamois appears, as well as the female, to participate of the feminine qualities of the she-goat. Thus it may be presumed, that the domestic he-goat would engender with the female chamois; and that, on the contrary, the male chamois could not engender with the female domestic goat. Time will verify or destroy this conjecture.

foetus, the female, who afterwards furnishes every thing necessary to its growth and nutrition, modifies and assimilates it more to her own nature, and must, therefore, greatly efface the impression of the parts derived from the male. Thus, if we want to form a distinct judgment of a species, we ought to examine the females. The male bestows one half of the animated substance : The female gives an equal portion, and furnishes, besides, all the matter necessary for the developement of the form. A beautiful woman seldom fails to produce beautiful children. The offspring of a beautiful man with an ugly woman, are generally still more ugly.

Hence, even in the same species, there may sometimes be two races, the one masculine and the other feminine, which, by both subsisting and perpetuating their distinctive characters, appear to constitute two different species ; and this seems to be the case, when it is almost impossible to fix the limits between what naturalists term *species* and *variety*. Let us suppose, for example, that some sheep were always served with he-goats, and others with rams ; after a certain number of generations, a race would be established among the species of sheep, which would partake greatly of the nature of the goat, and would afterwards perpetuate its own kind ; for, though the first produce of the he-goat would be little removed from the mother's species, and would be a lamb, and not a kid ; yet this lamb

is

is already covered with hair, and possesses some other characters of the father. Let these female mongrels be afterwards served with a he-goat; the produce in this second generation will make a nearer approach to the species of the father, and still nearer in the third, &c. In this manner, the foreign characters would soon overbalance the natural ones; and this fictitious race might support itself, and form a variety in the species, the origin of which would be difficult to trace. Now, what might arise from the influence of one species on another, may be produced with greater ease in the same species. If vigorous females be constantly served with feeble males, in process of time, a feminine race will be established; and, if very strong males are appropriated to females of inferior strength and vigour, a masculine race will be the result, so different in appearance from the first, that we could not assign to them a common origin, and, of course, would regard them as two distinct species.

To these general reflections, we shall add some particular facts. We are assured by Linnaeus*, that

* *Capra cornibus depressis, incurvis, minimis, cranio incumbentibus, gula barbata. Magnitudo haedi hirci: Pili longi, penduli; cornua lunata, crassa, vix digitum longa, cranio adpressa ut ferè cutem perforent: Habitat in America. Linnaeus, I suspect, has not been properly informed with regard to the country of this animal, and I believe it to be a native of Africa. My reasons are, 1. That no author mentions this*

that he saw in Holland two animals of the goat-kind, of which the one had very short, thick horns, lying almost flat on the skull; the horns of the other were erect, and bended backward at the points, and its hair was short. These animals, though they seemed to be more remote in species than the chamois and common goat, failed not to produce together; which demonstrates that these differences in the figure of the horns and length of the hair, are not essential and specific characters; for, as the animals produced together, they must be regarded as belonging to the same species. From this example, it may be concluded, that the chamois and our goat, whose principal differences lie in the form of the horns and the length of the hair, are probably the same species.

In the royal cabinet, there is the skeleton of an animal, which was sent under the name of *capricorne*.

this species of goat, nor even the common goat, as being ever found in America; 2. That all travellers, on the contrary, agree in assuring us, that there are three kinds of goats in Africa, a large, a middle, and a small kind; 3. That we have seen an animal, which we received under the name of the *African Buck*, and of which we have given a figure, that resembled so much Linnaeus's description of the *capra cornibus depressis*, &c. that we considered it to be the very same animal. For these reasons, we are entitled to affirm, that this small goat is an original native of Africa, and not of America.

Capra cornibus erectis, apice recurvis. Magnitudo haedi hirci unius anni. Pili breves, cervini. Cornua vix digitum longa, antrorsum recurvata apice: Haec cum praecedenti coibat, et pullum non diu superstitem in vivario Cliffortiano producebat. Facies utriusque adeo aliena, ut vix speciem eandem at diversissimam, argueret; Linn, Syst. nat. p. 96.

capricorne. In the form of the body and proportions of the bones, it has a perfect resemblance to the domestic he-goat; and the figure of the under jaw is the same with that of the wild goat. But it differs from both in the horns: Those of the wild goat have prominent tubercles or knobs, and two longitudinal ridges, between which there is a well marked anterior face: Those of the common he-goat have but one ridge, and no tubercles. The horns of the capricorne have but one ridge, and no anterior face: Though they want tubercles, they have rugosities which are larger than those of the he-goat. These differences seem to indicate an intermediate race between the wild and the domestic goat. Besides, the horns of the capricorne are short, and crooked at the point, like those of the chamois; and, at the same time, they are compressed and ringed: Hence they partake at once of the he-goat, the wild goat, and the chamois goat.

Mr Brown *, in his history of Jamaica, informs us, that there are in that island, 1. The
common

* *Capra I. cornibus carinatis arcuatis; Linn. Syst. Nat.*
The nanny-goat.

Capra II. cornibus erectis uncinatis, pedibus longioribus.

Capra cornibus erectis uncinatis; Linn. Syst. Nat. The
rupi-goat.

These are not, either of them, natives of Jamaica; but the latter is often imported thither from the main and Rubee-land; and the other from many parts of Europe. The milk of these animals is very pleasant in all those warm countries,
for

common domestic goat of Europe ; 2. the chamois ; 3. the wild goat. He assures us, that none of these animals are natives of America, but have been transported from Europe ; that, like the sheep, they have degenerated and become smaller in this new country ; that the wool of the sheep is changed into hair as coarse as that of the goat ; that the wild goat seems to be a bastard race, &c. Hence we are led to believe, that the small goat with erect horns, and crooked at the points, which Linnaeus saw in Holland, and was said to have come from America, is the chamois of Jamaica, that is, the European chamois degenerated and diminished by the climate of America ; and that the wild goat of Jamaica, called the *bastard wild goat* by

for it loses that rancid taste which it naturally has in Europe. A kid is generally thought as good, if not better, than a lamb, and frequently served up at the tables of every rank of people.

Capra III. cornibus nodosis in dorsum reclinatis ; *Linn. Syst. Nat.* . . . The bastard ibex.

This species seems to be a bastard sort of the ibex-goat ; it is the most common kind in Jamaica, and esteemed the best by most people. It was first introduced there by the Spaniards, and seems now naturalized in these parts.

Ovis I. cornibus compressis lunatis ; *Linn. Syst. Nat.* The sheep. These animals have been doubtless bred in Jamaica ever since the time of the Spaniards, and thrive very well in every quarter of the island ; but they are generally very small. A sheep carried from a cold climate to any of those sultry regions, soon alters its appearance ; for, in an year or two, instead of wool, it puts out a coat of hair like a goat. *The civil and natural history of Jamaica, by Patrick Brown, M. D. chap. 5. sect. 4.*

by Mr Brown, is our capricorne, which seems to be nothing else than the wild goat degenerated by the influence of climate.

M. Daubenton, after scrupulously examining the relations of the chamois to the he-goat and ram, says, in general, that it has a greater resemblance to the he-goat than to the ram. Next to the horns, the chief differences are found in the figure and size of the front, which is less elevated and shorter, and the form of the nose, which is more contracted in the chamois than in the he-goat; so that, in these two articles, the chamois resembles the ram more than the he-goat. But, by supposing, what is extremely probable, that the chamois is a constant variety of the species of the he-goat, as the bull-dog and greyhound are constant varieties in the dog-kind, we will perceive that these differences in the size of the front and the position of the nose, are not nearly so great in the chamois, when compared with the he-goat, as in the bull-dog and greyhound, which, however, produce together, and certainly belong to the same species. Besides, as the chamois resembles the he-goat in a greater number of characters than the ram, if he constituted a particular species, it must necessarily be an intermediate one between the he-goat and the ram. Now, we have seen, that the he-goat and ewe produce together: The chamois, therefore, which is an intermediate species between the two, and, at the same time, has a greater number

number of resemblances to the he-goat than to the ram, ought to produce with the she-goat, and, consequently, should be regarded as only a constant variety of this species.

Hence, as the chamois was transported into America, where it has become smaller, and produces with the small she-goat of Africa, it is more than probable that he would also produce with our she-goats. The chamois, therefore, is only a constant variety in the goat-kind, like the bull-dog in the species of dog. On the other hand, the wild goat is unquestionably the primitive goat in a state of nature, and is, with regard to the domestic goats, what the mouflon is to the sheep. The wild he-goat perfectly resembles the domestic he-goat in figure, structure, habits, and dispositions; and there are only two slight external differences between them. The horns of the wild he-goat are larger than those of the common he-goat. The former have two longitudinal ridges, and the latter but one. They have also large transverse protuberant rings, which mark the years of their growth; whilst those of the domestic he-goat have only a kind of transverse striae or furrows. The figure of their bodies is precisely the same. Their internal structure is likewise perfectly similar, with the exception of the spleen, which is oval in the wild he-goat, and approaches nearer to the spleen of the roebuck or stag, than to that of the he-goat or ram.

This

This difference may proceed from the violent exercise of the animal. The wild he-goat runs as swiftly as the stag, and leaps more nimbly than the roebuck. His spleen, therefore, should resemble that of the swiftest running animals. Hence this slight difference depends more upon habit than nature; and it is probable, that, if our domestic he-goat should become wild, and were obliged to run and leap like the wild he-goat, his spleen would soon assume the figure most conformable to this exercise. With regard to the difference of his horns, though very conspicuous, they fail not to resemble those of the domestic he-goat more than those of any other animal. Thus the wild and common he-goat approach nearer each other, even in the form of their horns, than any other animal; and, as their resemblance is complete in every other article, we should conclude, that, notwithstanding this slight and solitary difference, they are both animals of the same species.

The wild, the chamois, and the domestic goat must, therefore, be considered as the same species, the males of which have undergone greater variations than the females: I find, at the same time, in the domestic kind, secondary varieties, which are the less equivocal, because they belong equally to the males and females. We have seen that the goat of Angora *, though very

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different

* See vol. III. p. 493.

different from ours in the hairs and horns, is nevertheless of the same species. The same thing may be said of the Juda goat, which Linnaeus has properly considered as a variety of the domestic species. This goat, which is common in Guiney*, Angola, and other parts of Africa, may be said to differ from ours only in being smaller, fatter, and more squat. Its flesh is excellent; and, in that country, it is preferred to mutton, as we prefer mutton to goat's flesh. The Levant or Mambrina goat †, with long pendulous ears, is only a variety of the goat of Angora, which has also pendulous ears, though they are not so long. Those two goats were known to the ancients ‡; but they did not separate them from the common species. This variety of the Mambrina or the Syrian goat is more diffused than the goat of Angora; for we find goats with long ears

* In Guiney there are great numbers of goats similar to those in Europe, except that, like all the other cattle, they are very small. But they are fatter and plumper than wethers: It is for this reason that some people prefer the flesh of these small he-goats, which the natives castrate, to mutton; *Voyage de Bosman*, p. 238.

† It is called the Mambrina goat, because it is found on Mount Mambrina in Syria.——*Capra Indica*; *Gesner. hist. quad.* p. 267.——*Hircus cornibus minimis, erectis, parumper retrorsum incurvis, auriculis longissimis pendulis.*——*Capra Syriaca*; *La chevre de Syrie*; *Brisson. regn. anim.* p. 72.

‡ In Syria oves sunt cauda lata ad cubiti mensuram: Caprae auriculis mensura palmari et dodrantali, ac nonnullae demissis, ita ut spectent ad terram.——In Cilicia caprae sondentur ut alibi ovis; *Aristot. hist. anim. lib. 8. cap. 28.*

ears in Egypt *, and in the East Indies †, as well as in Syria. They yield a great deal of fine milk ‡, which the natives of the East prefer to that of the cow or buffalo.

With regard to the small goat which Linnaeus saw alive, and which produced with the American chamois, it must, as formerly remarked, have been originally transported from Africa; for it so strongly resembles the he-goat of Africa, that it is unquestionably the same species; or, at least, it has sprung from the same stock. In Africa it is small; and it would become still less in America; and we learn, from the testimony of travellers, that sheep, hogs, and goats, have frequently, and for several ages back, been transported from Africa, as well as Europe, into America, where they still subsist, without any other change than a diminution of size.

After examining the different varieties of goats, of which the nomenclators have made nine or ten different species, I am convinced that they ought

* *Ex capris complures sunt (in Ægypto) quae ita aures oblongas habent, ut extremitate terram ulque contingant; Prosper Alpin. hist. Ægypt. lib 4. p. 229.*

† At Pondicherry, there are kids which differ much from ours. They have large pendulous ears; and their aspect is mean and silly. Their flesh, though bad, is sometimes eaten; *Nouveau voyage, par le Sieur Luiller, p. 30.*

‡ Goats are remarkable for the length of their ears. — The size of the animal is somewhat larger than ours; but their ears are often a foot long, and broad in proportion; they are chiefly kept for their milk, of which they yield no inconsiderable quantity; and it is sweet, and well tasted; *Nat. hist. of Aleppo, by Alexander Ruffel. M. D.*

ought to be reduced to one: 1. The wild he-goat is the principal stock of the species. 2. The capricorn is the wild he-goat degenerated by the influence of climate. 3. The domestic he-goat derives his origin from the wild he-goat. 4. The chamois is only a variety in the species of the she-goat, with whom, like the wild he-goat, he should be able to mix and produce. 5. The small goat, with erect horns, crooked at the points, mentioned by Linnaeus, is the European chamois diminished by the influence of the American climate. 6. The other small goat, with horns lying flat on the skull, and which produced with the American chamois, is the same with the African he-goat; the fertility of these two animals is a proof that our chamois and domestic goat would also produce together, and, of course, that they belong to the same species. 7. The dwarf goat, which is probably the female of the African buck, is only, as well as the male, a variety of the common kind. 8. The same thing may be said of the buck and she-goat of Juda; for they are only varieties of our domestic goat. 9. The goat of Angora, as it produces with our goats*, belongs to the same species. 10. The Mambrina or Syrian goat, with very long pendulous ears, is a variety of the goat of Angora. Thus these ten animals are only different races of the same species, which have been

* See vol. III. Article Goat.

been produced by the influence of climate. *Caprae in multas similitudines transfigurantur*, says Pliny *. Indeed, from this enumeration, it is apparent, that the goats, though essentially similar among themselves, vary greatly in their external form; and, if we comprehend, like Pliny, under the generic name of *Goats*, not only those we have mentioned, but likewise the roebuck, the antilopes, &c. this species would be the most extensive in Nature, and contain more races and varieties than that of the dog. But Pliny, when he joined the roebuck, antilopes, &c. to the species of the goat, betrayed his ignorance of the real distinction of species. These animals, though they resemble the goat in many respects, constitute two different species; and we will perceive from the following articles, how greatly the antilopes vary both in species and in races; and, after enumerating all the antilopes and all the goats, we will still find other animals which participate of both. In the whole history of quadrupeds, I have met with nothing so confused, so uncertain, and so obscure, as the accounts given us by naturalists and travellers concerning the goats, the antilopes, and the species which have a relation to them. I have exerted every effort to throw
light

* *Caprae tamen in plurimas similitudines transfigurantur; sunt caprae, sunt rupicaprae, sunt ibices.—Sunt et origes.—Sunt et Damae et Pygargi et Streplicerotes, multaue alia haud dissimilia; lib. 8. cap. 53.*

light upon this subject; and shall not regret my labour, if what I now write should contribute to remove error, and to extend the views of those who incline to study Nature. But to return to our subject.

The goats are subject to vertigos: This disease is likewise common to the wild and chamois goats*, as well as the inclination to climb upon rocks, and the habit of perpetually licking stones †, especially those which are impregnated with nitre or salt. In the Alps, we find rocks hollowed with the tongues of the chamois. They are generally composed of tender and calcinable stones, in which there is always a certain quantity of nitre. These conformities in natural dispositions and manners appear to be
infallible

* In the mountains of Switzerland, the chamois or wild goats are very frequent.—The natives inform us, that these animals are subject to vertigos; and that, when attacked with this disease, they sometimes come down to the meadows, and mix with the horses and cows, when they are taken with ease; *Extrait du voyage de Jean-Jacques Scheuchzer; Nouvelles de la Republique des Lettres*, p. 182.

† Conveniunt saepe circa petras quasdam arenosas, et arenam inde lingunt.—Qui Alpes incolunt Helvetii hos locos sua lingua *Fultzen* tanquam salarios appellant; *Gesner, hist. quad.* p. 292.—What is singular, in the Alps there are several rocks which have been hollowed by the constant licking of the chamois goats. This licking is not occasioned, as has been alledged, by salt contained in these stones, which is very rarely the case; for the rocks are porous, and composed of grains of sand, which are easily detached; and they are swallowed by the animals with great avidity; *Extrait de Scheuchzer, ibid.* p. 185.

infallible indications of identity of species. The Greeks, as formerly remarked, did not divide these three animals into three distinct kinds; and our hunters, who probably never consulted the Greeks, have also regarded them as the same species. Gaſton Phaebus *, when treating of the wild goat, points him out under the name of the *wild buck*; and the chamois, which he calls *yfarus and jarris*, in his estimation, is only another wild buck. I acknowledge that all these authorities amount not to a complete proof: But, when joined to the facts and reasonings already employed, they form so strong a presumption, with regard to the unity of species in these three animals, as leaves no room for hesitation.

The wild and chamois goats, which I considered, the one as the male, and the other as the female stock of the goat-kind, are only found, like the mouflon, which is the stock of the sheep, in the deserts and in the highest and most rugged mountains. The Alps, the Pyrennees, the Grecian mountains, and those in the islands of the Archipelago, are almost the only places where the wild and chamois goats are to be met with. Though both avoid heat, and inhabit the regions of snow and frost; yet they equally avoid the excessive rigours of cold. In summer they dwell on the northern sides of the mountains; in winter, they frequent the southern sides, and descend

* La venerie de Gaſton Phaebus, p. 68.

scend from the summits into the plains. Neither of them can support themselves on smooth sheets of ice; but, when the ice is rendered rough by the snow, they run and bound with great firmness and agility. The chase of those animals *, especially that of the wild he-goat, is

* There are two kinds of bucks; some are called *wild bucks*, and others *ysarus* or *farris*. The wild bucks are as large as a stag; but, though they have as much flesh, they are neither so long, nor make such large bounds. The years of their age correspond with the number of rings across their horns.—When old, their horns, which have no branches, are as thick as a man's leg. They never cast their horns; but they continue to grow in length and thickness as long as the animal lives. They have a large beard, and their hair is brown like that of the wolf. A black bar runs along their back and down the buttocks. Their belly is yellow, and their legs black, and yellow behind. Their feet, like those of the domestic goat, are cloven; and their tracks are large, and rounder than those of the stag. The female, like that of the hind, or common she-goat, produces but one at a time.

The bucks feed upon herbage like other cattle.—Their dung resembles that of the domestic goat. They come in season about All Saints-day, and their rutting season continues a month. When that season is over, they are much emaciated; and they descend from the rocks and mountains, where they had dwelt during the summer, to the plains, in quest of food. They remain at the foot of the mountains till toward Easter, when they return to the most elevated places they can find, and each takes possession of his bush, like the stags. The females, at this period, separate from the males, and retire near the brooks, in order to fawn, where they remain during the summer. When the bucks are thus separated from the females, especially at the approach of the rutting season, they attack both man and beast. They also fight among themselves, like the stags, but in a different manner;

is very laborious; for dogs are almost useless in this kind of hunting. It is also sometimes dangerous: When the animal finds himself hard pushed, he gives the hunter a violent blow with his head, and often throws him over a precipice *. Though not so strong as the wild bucks, the chamois goats are equally active †. They are

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more

manner; for their quarrels are more formidable. The buck strikes so furiously with his head, that he often breaks the legs of those whom he attacks; and, if he runs a man against a tree, or throws him down on the ground, death is infallibly the consequence. Such is the nature of the buck, that, though a strong man gives him a blow on the back with a bar of iron, the animal's spine is not broken. In the season of love, his neck swells prodigiously: And, though he falls from a height of ten fathoms, he receives no injury.

The buck called *Urus* is of the same figure with the preceding, and is not larger than the domestic he-goat. His nature is the same with that of the wild buck.——Like the stag, both come in season about All Saints-day, and they should be hunted till that period arrives.——When they can find no other food in winter, they eat the leaves of the pine-tree, which are always green. Their skin, when properly dressed, is an excellent defence against the cold; for, when the hair is outmost, neither cold nor rain can penetrate it. Their flesh is not very wholesome; for it produces fevers.——The hunting of the buck is not very pleasant; for we can neither accompany the dogs on foot nor on horseback; *Gaston Phœbus, Venerie de Dujoilloux, p. 68.*

* *Ibex venatorem expectat, et sollicitè observat an intersum et rupem minimum intersit spatium; nam si visu dumtaxat intueri (ut ita loquar) possit, impetu facto se transfert et venatorem impulsus præcipitat; Stumpfius apud Gesner, p. 305.*

† M. Perroud, undertaker of the crystal mines in the Alps, brought a live chamois to Versailles, and gave us the following excellent remarks on the nature and manners of this animal,

mal,

more numerous, and go generally in flocks. In the Alps and Pyrennees, however, they are not
 now

mal. "The chamois, though a wild animal, is very docile. He inhabits only the mountains and rocks. He is of the size of a domestic goat, whom he greatly resembles. His vivacity is delightful, and his agility truly admirable. His hair is as short as that of a hind: In spring, it is ash-coloured, in summer it is yellowish, in autumn yellowish brown mixed with black, and, in winter, brownish black. The chamois goats are numerous in the mountains of Upper Dauphiny, Peidmont, Savoy, Switzerland, and Germany. They are very social among themselves: We find them going in pairs, or in little flocks of from three to twenty; and sometimes we see from sixty to a hundred of them dispersed in different flocks along the declivity of the same mountain. The large males keep at a distance from the rest, except in the rutting season, when they join the females, and beat off all the young. At this period, their ardour is still stronger than that of the wild bucks. They bleat often, and run from one mountain to another. Their season of love is in the months of October and November, and they bring forth in March and April. A young female takes the male at the age of eighteen months. The females bring forth one, but rarely two, at a time. The young follow their mothers till October, if not dispersed by the hunters or the wolves. We are assured that they live between twenty and thirty years. Their flesh is very good. A fat chamois goat will yield from ten to twelve pounds of suet, which is harder and better than that of the goat. The blood of the chamois is extremely hot, and it is said to have qualities and virtues nearly equal to those of the wild goat, and may serve the same purposes; for the effects are the same, when taken in a double dose. It is good against pleurifies, and possesses the property of purifying the blood, and promoting perspiration. The hunters sometimes mix the blood of the wild and chamois goats: At other times, they sell the blood of the wild goat for that of the chamois. It is very difficult to distinguish them; which shows that the blood of the wild goat differs very little from that of the chamois. The voice of the chamois is a very low and almost imperceptible kind
 of

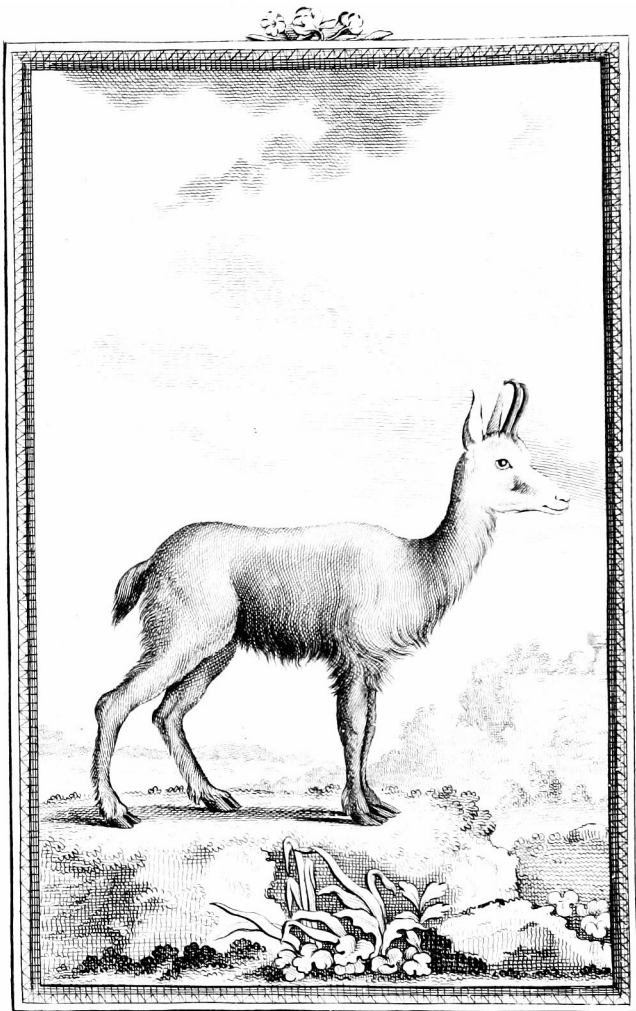
now so frequent as formerly. The term *chamoiseurs*, which was applied to all transporters of skins,

of bleating, resembling that of a hoarse domestic goat. It is by this bleating that they collect together, particularly the mothers and their young. But, when alarmed, or when they perceive their enemy, or any thing the nature of which they cannot distinguish, they advertise one another by a kind of whistling noise, which I shall afterwards describe. The sight of the chamois is very penetrating, and his sense of smelling is acute. When he sees a man distinctly, he stops for some time, and flies off when he makes a nearer approach. His sense of hearing is equally acute as that of smelling; for he hears the smallest noise. When the wind blows in the direction between him and a man, he will perceive the scent at the distance of more than half a league. Hence, when he smells or hears any thing which he cannot see, he whistles or blows with such force, that the rocks and forests re-echo the sound. If there are many of them near, they all take the alarm. This whistling is as long as the animal can blow, without taking breath. It is at first sharp, and turns flat at the end. The chamois then stops for a moment, looks round on all sides, and begins whistling afresh, which he continues from time to time. His agitation is extreme. He strikes the earth with his feet. He leaps upon the highest stones he can find: He again looks round, leaps from one eminence to another, and, when he discovers any thing, he flies off. The whistling of the male is sharper than that of the female. This whistling is performed through the nostrils, and consists of a strong blowing, similar to the sound which a man may make by fixing his tongue to the palate, with his teeth nearly shut, his lips open, and somewhat extended, and blowing long and with great force. The chamois feeds on the finest herbs. He selects the most delicate parts of plants, as the flowers and the tenderest buds. He is very fond of some aromatic herbs, particularly of the carline thistle and genipay, which are the hottest plants that grow in the Alps. When he eats green herbs, he drinks very little. He is very fond of the leaves and tender buds of shrubs. He ruminates like the common goat.

The

skins, seems to indicate, that the chamois skins were at that time the chief article of their commerce;

The food he uses seems to announce the heat of his constitution. This animal is admired for his large round eyes, whose size corresponds with the vivacity of his disposition. His head is adorned with two small horns, from half a foot to nine inches in length. Their colour is a fine black, and they are placed on the front nearly between his eyes; and, instead of being reflected backward, like those of other animals, they advance forward above the eyes, and bend backward at the points, which are extremely sharp. He adjusts his ears most beautifully to the points of his horns. Two tufts of black hair descend from his horns to the sides of his face. The rest of the head is of a yellowish white colour, which never changes. The horns of the chamois are used for the heads of canes. Those of the female are smaller and less crooked. The skin of the chamois, when dressed, is very strong, nervous, and supple, and makes excellent riding breeches, gloves, and vests. Garments of this kind last long, and are of great use to manufacturers. The chamois is a native of cold countries, and always prefers rugged rocks and lofty places. They frequent the woods; but it is only those in the higher regions of the mountains. These woods consists of pines, larches, and beeches. The chamois goats are so impatient of heat, that, in summer, they are only to be found under the shades of caverns in the rocks, among masses of congealed snow and ice, or in elevated forests on the northern declivities of the most scabrous mountains, where the rays of the sun seldom penetrate. They pasture in the mornings and evenings, and seldom during the day. They traverse the rocks and precipices with great facility, where the dogs dare not follow them. There is nothing more worthy of admiration than to see these animals climbing or descending inaccessible rocks. They neither mount nor descend perpendicularly, but in an oblique line. When descending, particularly, they throw themselves down across a rock, which is nearly perpendicular, and of twenty or thirty feet in height, without



A. Bell's sculp.

CHAMOIS GOAT.



A. Belle sculpture

DWARF GOAT.

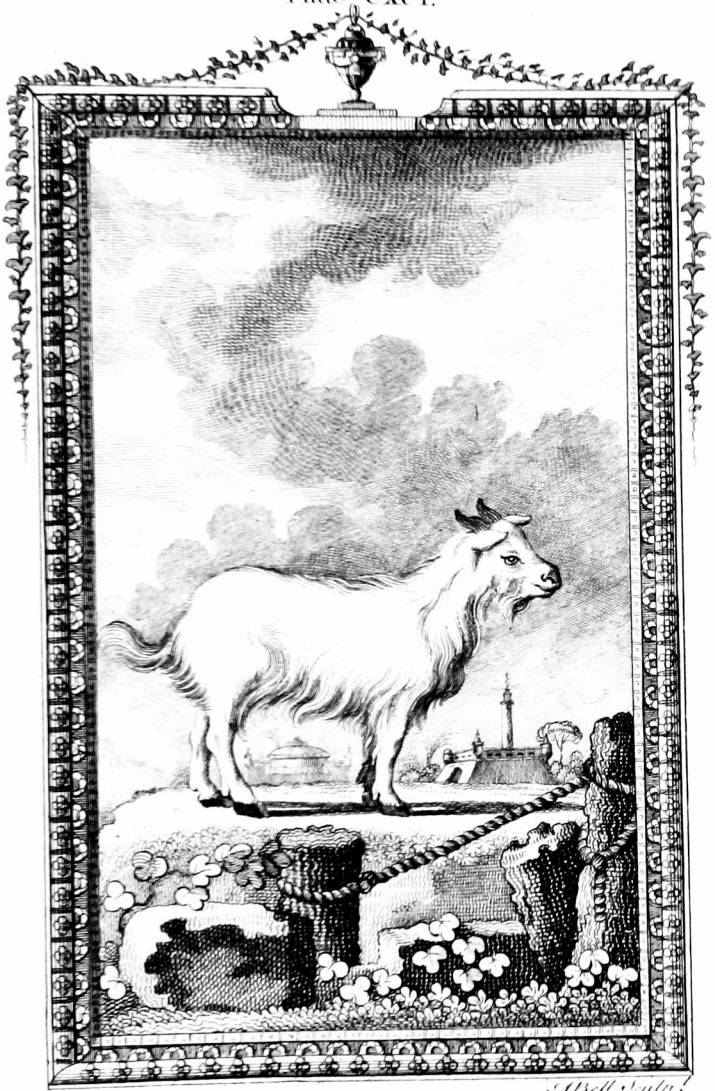


A Bell's sculp.

SHE-GOAT of JUDA.



BUCK of JUDA.



BUCK OF JUDA.



W. Miller sculp.

AFRICAN HE-GOAT

merce ; but the skins of goats, sheep, stags, roe-bucks, and the fallow-deer, are their principal objects.

With

out having a single prop to support their feet. In descending, they strike their feet three or four times against the rock, till they arrive at a proper resting-place below. The spring of their tendons is so great, that, when leaping about among the precipices, one would imagine they had wings instead of limbs. It has been alledged, that the chamois, in climbing and descending rocks, supports himself by his horns. I have seen and killed many of these animals ; but I never saw them use their horns for this purpose ; neither did I ever hear the fact supported by any hunter. It is by the strength and agility of his limbs that the chamois is enabled to climb and descend rocks. His legs are very free and tall ; those behind are somewhat longer, and always crooked, which favours their springing to a great distance ; and, when they throw themselves from a height, the hind legs receive the shock, and perform the office of two springs in breaking the fall. It is said, that, when there are numbers of chamois goats together, one is deputed to stand sentinel, for the protection of the rest. I have seen many flocks of them, but never observed this part of their oeconomy. It is true, that, when there are many of them, some always watch while others eat ; but I remarked nothing more singular here than what happens in a flock of sheep : For the first who perceives any thing alarming, advertises the rest, and, in an instant, the same terror is communicated to the whole. In great snows, and during the rigour of winter, the chamois goats inhabit the lower forests, and live upon pine leaves, the buds of trees, bushes, and such green or dry herbs as they can find by scratching off the snow with their feet. The forests that delight them most, are those which are very full of rocks and precipices. The hunting of the chamois is very difficult and laborious. The mode most in use is to kill them by surprise. The hunters conceal themselves behind rocks or large stones, taking care that the

With regard to the specific virtue attributed to the blood of the wild goat, against certain diseases, and particularly the pleurisy, a virtue which is thought to be peculiar to this animal, and which, of course, would lead us to think it to be of a peculiar nature; it has been discovered, that the blood of the chamois *, and likewise that of the domestic he-goat †, have the same properties, when the animals are nourished with the same aromatic herbs; so that even this property seems to unite these three animals in the same species.

S U P P L E M E N T.

We here give a figure of a Juda buck, which appears to be different from that published in the original work. M. Bourgelat had it alive, and

the wind blows opposite to them, and, when a favourable opportunity occurs, shoot them with musket-balls. They are likewise hunted in the same manner as stags and other animals, by posting some of the hunters in narrow passages, while others beat about to raise the game. Men are preferable for this purpose to dogs; for dogs too quickly disperse the animals, who fly off suddenly to the distance of four or five leagues." See also on this subject *La troisième description du Voyage des Alpes de Scheuchzer, p. 11.*

* See above p. 356.

† See l'Hist. des animaux, par Mess. Arnault de Nobleville & Salerne, tom. 4. p. 243.

and still keeps its skin in his anatomical cabinet. It was considerably larger than the one formerly engraved. It was two feet nine inches long, and one foot seven inches high, while the other was only twenty-four inches and a half long, and seventeen inches high. The head and whole body were covered with large white hairs. The points of the nostrils were black. The horns nearly touch each other at the base, and then recede. They are much longer than those of the former, which the present one resembles in the feet and hoofs. These differences are too slight to constitute two distinct species. They seem to be only varieties of the same species.

We formerly mentioned Syrian goats with pendulous ears, which were nearly of the same size with the domestic kind, and produced with them even in our climate. In Madagascar there is a goat considerably larger, with pendulous ears so long, that, when they fall down, they cover the eyes, which obliges the animal to move its head almost continually in throwing them back. Hence, when pursued, it always endeavours to ascend. This notice was communicated to us by M. Comerson; but it is too imperfect to enable us to determine whether this goat belongs to the Syrian race with pendulous ears, or to a different species.

We had the following note from M. le Vicomte de Querhoënt.

‘ The

‘ The goats which were left on Ascension
‘ island have multiplied greatly; but they are
‘ very meager, especially in the dry season.
‘ The whole island is beaten with their tracks.
‘ During the night, they retire into the exca-
‘ vations of the mountains. They are not so large
‘ as the common goat. They are so weak, that
‘ men sometimes seize them in the chase. Their
‘ hair is generally of a deep brown colour.’

The

The SAIGA, or SCYTHIAN ANTILOPE*.

IN Hungary, Poland, Tartary, and the southern parts of Siberia, there is a species of goat, called *Seigab* or *Saiga* by the Russians, which, in the figure of the body and the hair,

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* The Scythian antelope has horns a foot long, bending a little in the middle, the points inclining inward, and the ends smooth; the other part is surrounded with very prominent annuli. They are of a pale yellow colour, and the greatest part semipellucid. The length of the animal is four feet nine inches and a quarter; the height before, two feet six inches and a half, and behind, two feet seven inches and a half. The tail is three inches long. The head is like that of a sheep; the nose is very large, arched, and marked the whole length with a small line, caused by the elevation of the *septum narium*. The nostrils are tubular and large. The upper lip hangs over the under. The nose is formed of a muscular substance mixed with fat. The cutting teeth are so loose in their sockets, as to move with the least touch. The male is covered with rough hair, like the he-goat, and has a very strong smell: The female is smoother. The hair on the bottom of the sides and the throat is long, and resembles wool; that on the sides of the head and neck is hoary. The back and sides are of a dirty white colour. The breast, belly, and inside of the thighs, are of a shining white. The females are hornless and timid: If attacked by wolves or dogs, the males place the females in the centre, and defend them stoutly. They bleat like sheep. Their common pace is a trot; when they go faster, it is by leaps, and they are swifter than roebucks. When they feed, they lift up the upper mandible, and go backward; *Pennant's Synops. of quad.*

resembles the domestic goat. But the form of its horns and the want of a beard make it approach nearer to the antilopes; and, indeed, it seems to constitute the shade between these two kinds of animals; for the horns of the saiga are perfectly similar in figure, transverse rings, longitudinal furrows, &c. to those of the antelope, and they differ in colour only. The horns of all the antilopes are black and opaque; but those of the saiga are whitish and transparent. This animal is mentioned by Gesner under the name of *colus* *, and by Gmelin under that
of

Colus; Gesner, quad. p. 361.

Suhak; Rzaczinski, Hist. Polon. p. 224.

Ibex imberbis; Nov. Com. Petrop. tom. 5. tab. 19. tom. 7. p. 39.

Sayga; Phil. Transf. 1767, p. 344. Bell's travels, vol. 1.

p. 43.

Capra Tartarica, cornibus teretibus, rectiusculis, perfecte annulatis, apice diaphanis, gula imberbi; Linn. Syst. Nat. p. 97.

Antilope Scythica; Pallas Spicil. p. 9. Faunul. Sinens.

* Apud Scytas et Sarmatas quadrupes fera est quam *Colos* (Κολος) appellant, magnitudine inter cervum et arietem, albicante corpore; eximiae supra hos levitatis ad cursum; Strabo lib. 7. . . . Sulac (a quo litteris transpositis nomen *Colus* factum videtur) apud Moschobios vulgo nominatur animal simile ovi sylvestri candidae, sine lana; capitur ad pulsum tympanorum dum saltando delassatur. . . . Apud Tartaros (inquit Matthias a Michow) reperitur *Snak*, animal magnitudine ovis, duabus parvis cornibus praeditum, cursu velocissimum, carnes ejus suavissimae. . . . In desertis campis circa Borysthenem (inquit Sigismundus, Liber Baro in Herberstein in commentariis rerum Moscoviticarum) Tanaim et Rha est ovis sylvestris quam Poloni *Solbac*, Mosci *Seigak* appellant, magnitudine capreoli, brevioribus tamen pedibus; cornibus

of *saiga* *. The horns in the Royal cabinet were sent under the denomination of *horns of the*

nibus in altum porrectis, quibusdam circulis notatis, ex quibus Mosci manubria cultellorum transparentia faciunt, velocissimi cursus et altissimorum saltuum; *Gesner, Hist. quad. p. 361. et 362. ubi vide figuras.*

* In the environs of Sempalat, there are a number of *Saigi* or *Saiga*. This animal has a great resemblance to the roebuck, except that its horns are straight. It is known in no other part of Siberia; for what is called *Saiga* in the province of Irkutsk is the musk. . . . The taste of its flesh, it is said, resembles that of the stag; *Voyage de Gmelin à Kamtschatka, tom. 1. p. 179.—Note* M. Gmelin has since published a more comprehensive description of the saiga, in the first volume of the New Memoirs of the Academy of Petersburg, under the name of *ibex imberbis*; but he has given no figure of it. M. Gmelin remarks, that this animal has the head of a ram, with a higher and more prominent nose, and the body of a stag, but smaller; for it never reaches the size of a roebuck. The horns are yellowish and transparent, a foot in length, ringed toward the base, and situated above the eyes. The ears are erect, pretty large, and terminate in a point. In the under jaw, there are four cutting, four canine, and five grinding teeth, each of the last having two roots. In the upper jaw there are an equal number of cutting and canine teeth, but only four grinders, each of which has three roots. The neck is pretty long. The hind are longer than the fore legs. The foot is cloven. The female has four paps. The tail is thin, and about three inches long. The hair, like that of the stag, is of a yellowish brown colour on the body, and white under the belly. The female is smaller than the male, and has no horns. . . . Worms breed under their skin. . . . These animals copulate in autumn, and bring forth one or two young in the spring. They live upon herbage, and are very fat when the rutting season commences. In summer, they inhabit the plains along the banks of the Irtis. In winter, they go to the higher grounds; and they are found not only about the Irtis, but in all the countries watered by the Boristhenes, the Don, and the Wolga; *Vide Nov. Com. Acad. Petrop. tom. 5. p. 345.*—The secretary of the Petersburg Academy

the Hungarian buck. They are so transparent, that they are used for the same purposes as shells. In natural dispositions, the saiga has a greater resemblance to the antilopes than to the wild and chamois goats; for he does not frequent the mountains, but, like the antilopes, lives on the hills and plains. Like them, he is extremely swift, and his motion consists of bounds or leaps. His flesh is also better than that of either the wild or domestic goat.

The

adds to what M. Gmelin has remarked, that the saiga goes backward when he feeds. . . . That their horns are purchased by the Chinese to make lanthorns. . . . That they are only found under the 54th degree of latitude; and that, in the East, there are none beyond the river Oby; *Ibid.* p. 35.

The ANTILOPES, or GAZELLES *.

OF the animals called *antilopes*, we know thirteen species, or at least thirteen distinct varieties. In this uncertainty with regard to species and variety, we thought it best to treat of the whole under one article, assigning to each, however, a proper name. The first of these animals is the common *gazelle*, or Barbary antilope †, which is found in Syria, Mesopotamia, and other provinces of the Levant, as well as in Barbary,

* In Arabic, *Gazal*, a generic name applied to several species of animals.

† The horns of the Barbary antilope are twelve inches long, round, inclining first backward, bending in the middle, and then reverting forward at their ends, and annulated with about thirteen rings on their lower part. The upper side of the body is of a reddish brown colour; the lower part and buttocks are white. Along the sides, the two colours are separated from each other by a strong dusky line. On each knee there is a tuft of hair; *Pennant's Synops. of quad. p. 33.*

Gazella Africana, cornibus brevioribus, ab imo ad summum fere annulatis, et circa medium inflexis; *Raii Synops. quad. p. 80.*

Capra dorca, cornibus teretibus, perfecte annulatis, recurvatis, contortis; *Linn. Syst. Nat. p. 96.*

Algazel ex Africa; *Hernand. Hist. Mexic. p. 893.*

Hircis cornibus teretibus, arcuatis, ab imo ad summum fere annulatis, apice tantummodo levi. . . . *Gazella Africana*; *La Gazelle d' Afrique*; *Brisson, quad. p. 45.*

Dorcas, *Dorcades Libycae* ventre sunt albo, qui color eis ad laparas usque adscendit, ad ventrem vero utrinque latera nigris vittis distinguuntur; reliqui corporis color rufus aut flavis est, et pedes quidem eis longi sunt, oculi nigri, cornibus caput ornatur, et longissimas aures habent; *Elian, de nat. anim. lib. 14. cap. 14.*

Barbary, and in all the northern parts of Africa. The horns of this antelope are about a foot in length. They have entire rings at their base, and then half rings till within a small distance from the extremities, which are smooth and pointed. They are not only surrounded with rings, but furrowed longitudinally. The rings mark the years of growth, and they are commonly from twelve to thirteen in number. The antilopes in general, and this species in particular, have a great resemblance to the roebuck in figure, natural functions, nimbleness of movement, vivacity, largeness of the eyes, &c. And, as the roebuck exists not in the countries inhabited by the antelope, we would at first be led to conclude, that it is only a degenerated roebuck, or that the roebuck is an antelope whose nature has been changed by the effects of climate and food. But the antilopes differ from the roebuck in the substance of their horns. Those of the roebuck are a kind of solid *wood*, which falls off and is renewed annually, like that of the stag. The horns of the antilopes, on the contrary, are hollow and permanent, like those of the goat. Besides, the roebuck has no gall-bladder. The antilopes, as well as the roebucks, have hollows before the eyes. They resemble each other still more in the quality of the hair, in the whiteness of the buttocks, and in the tufts on their legs; but, in the roebuck, these tufts are on the hind-legs, and on the fore legs of the antilopes. Hence the antilopes seem to be intermediate animals

animals between the roebuck and goat. But, when it is considered that the roebuck exists equally in both Continents, and that the goats, as well as the antilopes, are peculiar to the Old World, we are led to think, that the goats and antilopes are more allied to each other than they are to the roebuck. Besides, the only characters peculiar to the antilopes are the transverse rings and longitudinal furrows on the horns; the tufts of hair on the fore-legs; a thick and well defined band of black, brown, or reddish hairs below the flanks; and, lastly, three stripes of whitish hairs, which extend longitudinally upon the internal surface of the ears*.

The

* *Algazel ex Africa, animal exoticum . . . ex Africa Neapolim missum; magnitudine Capreae, Capreoli dicti, cui toto habitu prima facie simile, nisi quod cornibus nulli magis quam hirco similioribus sit praeditum. . . . Pilo est brevi, levi, flavicante, at in ventre et lateribus candicante, sicut in internis femorum et brachiorum, illoque capreolo molliori. Altitudo illius in posterioribus, quae sublimiora sunt anterioribus tibiis, tres spithamas aequat. Corpus obesius, et collum crassius habet; cruribus et tibiis admodum gracile: Ungulis bifurcis admodum dissectis, illisque tenuibus, et hircinis oblongioribus, et acutioribus similitudine alces, et nigricantibus. Caudam habet dodrantem fere pilosam, hircinam, et a medio usque ad extremum nigrescentem. . . . Hilaris aspectu facies; oculi magni, nigri, lucidi, laeti; aures longae, magnae, patulae, in prospectu elatae, illaeque intus canaliculatae quinquefido strigium ordine nigricante, extumentibus circa illas striis pilosis candicantibus, et linea tenui circumducta. . . . Cornua pedem Romanum longa, retrorsum inclinata, hircina, ex nigro castaneo colore cochleatim striata et interno situ ad invicem sinuata, et post dilatationem reflexa, atque deinde in extremo parum acie resupinata. . . . Nasus colore magis rufo, sicuti*
 ex

The second antelope is found in Senegal, where, according to Mr Adanson, it is called *kevel* *. It is less than the common kind, and is nearly of the size of our small roebucks. Its eyes are also larger than those of the gazelle, and its horns, instead of being round, are flattened on the sides. This compression of the horns proceeds not from a difference of sex; for, in both males and females, the horns of the one species are round, and of the other flat. In every other article, the resemblance is complete. The kevel, like the gazelle, has short yellow hair, white belly and thighs, a black tail, a brown band under the flanks, three white stripes on the ears, black horns surrounded with rings, longitudinal furrows between the rings, &c. The number of these rings, however, is greater in the kevel than in the gazelle; for the latter has generally twelve or thirteen, and the former at least fourteen, and often eighteen.

The

ex oculis parallelo ordine linea nigricans dependet ad os usque, reliquis candicantibus. Nares et labia, os et lingua nigrescunt, quod fatis dum ruminabat observavimus; dentibus, ovium modo, exiguis et vix conspicuis; vocem edit non abfimilem fuillae. *Fab. Columnae*, Annot. et Addit. in rerum. Med. nov. Hisp. Nardi. Ant. Recchi. . . . *Hernand. hist. Mex.* p. 893. et 894.

* The horns of the kevel, or flat-horned antelope, are shaped like those of the last, but flattened on their sides. The rings are more numerous, being from fourteen to eighteen. It is of the size of the roebuck; and in colours and marks resembles the preceding species; *Pennant's Synops. of Quad.* p. 34. Antelope kevella; *Pallas, Miscell.* 7. *spicil.* 12.

The third antelope we shall denominate *corine**, from the name *korin*, which it bears, according to M. Adanson, in Senegal. It has a great resemblance to the gazelle and kevel. But it is still smaller than the kevel, and its horns are thinner, shorter, and smoother, the rings which encircle them being hardly perceptible. M. Adanson, who communicated to me his description of this animal, says, that it appeared to partake somewhat of the chamois goat, but that it was much smaller, being only two feet and a half long, and less than two feet high; that his ears are four inches and a half in length, the tail three inches, the horns six inches long, and only half an inch thick; that they are two inches asunder at the base, and from five to six at their extremities; that, instead of rings, they have circular *rugae*, very near each other in the inferior part, and more distant in the superior; that these *rugae*, which hold the place of rings, are about sixteen in number; that the hair of this animal, which is short, shining, and close set, is yellow on the back and flanks, white on the belly and

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* The corine, or spotted antelope, has very slender horns, six inches long, and surrounded with circular *rugae*. It is less than a roebuck. On each side of the face there is a white line. The neck, body, and flanks, are tawny; the belly and inside of the thighs white, which is separated from the sides by a dark line. On the knees there is a tuft of hair. Some are irregularly spotted with white: Perhaps these are the spotted goats of Kolben, tom. 2. p. 115.; Pennant's *Synops. of quad.* p. 37.

the inside of the thighs; that the tail is black; and that, in the same species, some individuals have white spots scattered over their bodies without any order.

These differences between the gazelle, the kevel, and the corine, though very conspicuous, seem to be neither essential, nor sufficient to make these animals three distinct species. In every other respect, they resemble each other so strongly, that they appear to be of the same species, varied a little by the influence of climate and food; for the kevel and gazelle differ less from one another than from the corine, whose horns resemble not those of the other two. But all the three have the same natural habits; they go in troops, associate together, and feed in the same manner; their dispositions are gentle; they are easily accustomed to a domestic state; and their flesh makes excellent eating. We may, therefore, conclude, that the gazelle and kevel certainly belong to the same species, and that it is doubtful whether the corine be a variety only of the same, or really constitutes a distinct species.

In the royal cabinet, there are spoils, either entire or partial, of these three antilopes. We have likewise a horn, which greatly resembles those of the gazelle and kevel, but it is much larger. This horn is also engraven by Aldrovandus*. Its thickness and length seem to indicate

* Lib. 1. de bifulcis, cap. 21.

an animal of greater magnitude than the common antilope; and I imagine it belongs to an antilope called *tzeiran* by the Turks, and *abu* by the Persians. This animal, says Olearius*, has some resemblance to the fallow-deer, except that it is reddish, instead of yellow; that its horns have no antlers, and lie on the back, &c. According to Gmelin†, who mentions this

* We saw daily great numbers of a species of stag, called *Tzeiran* by the Turks and *abu* by the Persians. They had some resemblances to our fallow deer; but they were rather reddish than yellow, and their horns want antlers, and lie on the back. They are exceedingly swift, and are only found, according to our information, in the province of Mokau, and in the neighbourhood of Scamachia, Karraback, and Merzagé; *Relation d'Olearius, tom. 1. p. 413.*

† I was shown a kind of deer, called *djberen* in the language of the country. It resembled the roebuck, except that it had the horns of a wild he-goat, which never fall off. What is singular in this animal, that, in proportion as his horns grow, the size of the *larinx*, or *ponum Adami*, augments; so that, when old, he has a considerable swelling on his throat. Dr Messerschmid asserts that this roebuck has an absolute aversion to water. But the inhabitants of Tongus assured me, that, when hunted, he often takes to the water, in order to make his escape; and Brigadier Bucholz, at Selenginsck, told me, that he had tamed one completely; that it followed his servant when swimming; and that it often went to an island in the river Selinga, which it never would have done, if it had a natural aversion to water. These roebucks are as swift as the saigas on the borders of the Irdis; *Voyage de M. Gmelin en Sibirie, tom. 2. p. 103.*—M. Gmelin has since given a more complete description of this animal, in the New Petersburg Memoirs, under the appellation of *Caprea campestris gutturosa*, of which the following is an abridgment:—This animal resembles the roebuck in figure, size, colour, and man-

this animal under the name of *dšeren*, it resembles the roebuck, except in its horns, which, like those of the wild he-goat, are hollow, and never fall off. This author adds, that, in proportion as the horns grow, the cartilage of the larynx enlarges, and forms a considerable prominence when the animal is old. According to Kempfer *, the figure of the *abu* differs not

ner of going. . . . It has no cutting teeth in the under jaw. The male differs from the female by having horns and a protuberance on the throat. The horns are somewhat compressed at the base. They have rings for a great part of their length; they are smooth at the points; and they are blackish, but perfectly black at the extremities. They are permanent, and shed not, like those of the roebuck. . . . Upon the throat of the male, there is a large protuberance of five inches in length, and three in breadth: It is smaller when the animals are young, and is not perceptible till they are near a year old. Its growth keeps pace with that of the horns. . . . This protuberance is occasioned by the structure of the larynx and the orifice of the trachea, which are very large. . . . The female is perfectly similar to the female roe. . . . This animal differs from the *Ibex imberbis*, or *saiga*: The nose of the *saiga* is large and split like that of the ram; but the nose of this animal is entire and pointed, like that of the roebuck. . . . The Monguls, and even the Russians, call the male *dšeren*, and the female *ona*, &c.; *Nov. Comment. Acad. Petropol. tom. 5. p. 347.*—The Secretary to the Petersburg Academy adds, that, in the manuscripts of Messerschmid, this animal is mentioned under the names of *obua*, *dšeren*, and *scharchoefski*; *Id. p. 36.*

* *Ipsum animal (Abu) a cervis nihil habet dissimile præter barbam, et cornua non ramosa quibus se caprino generi adfoeciat; cornua sunt simplicia, atra, rotundis annulis ultra mediam usque longitudinem distincta, levia et quasi ad modulum tornata; in mari quidem furrecta, pedalis longitudinis, in medio levi arcu disjuncta, fastigiis rectis mutuo utcumque imminantibus;*

not from that of the stag: But he approaches to the goats by his horns, which are simple, black, and ringed for more than one half of their length, &c.

Some other travellers * have likewise mentioned this species of antelope under the name of *geiran* or *jairan*, which, as well as *dsherén*, may be easily referred to the original name *tzeiran*. This antelope is common in South Tartary, in Persia, and seems also to be found in the East Indies †.

• To these four species or races of antilopes, we may add other two, which have a great resemblance to them. The first is called *Koba* ‡ in Senegal,

minentibus; in faemina vero praeparva vel nulla; *Kaempfer, amoenitates, p. 404.*—*Note.* The descriptions here given by Kemfer of the *pasen* and *abu*, correspond not with the figures.

* Upon the route from Tauris to Kom, we saw a kind of wild animals, whose flesh was good, and the Persians called them *geirans* or *garzelles*; *Voyage de Gemelli Careri, tom. 2. p. 63.*—In the deserts of Mesopotamia, there are vast numbers of antilopes, which the Turks call *Jairain*; *Voyage de la Boullaye-le-Gouz, p. 247.*

† In the forests of Guzarat, every kind of game, or venison, abounds, particularly, fallow-deer, roebucks, *abus*, and wild asses; *Voyage de Mandelsto, tom. 2. p. 195.*

‡ The horns of the Koba, or Senegal antelope, are almost close at the base, and bend out greatly a little above; they approach again towards the ends, and recede from each other towards the points which bend backwards. The distance in the middle is six inches and a half, above that, four inches, at the points six. The length of the horns is seventeen inches, and the circumference at the bottom eight. They are surrounded with fifteen prominent rings, and the ends are smooth

Senegal, where the French give it the denomination of the *great brown cow*. The second, which we shall call *Kob**, is also a native of Senegal, and called the *small brown cow* by the French. The horns of the kob have a great resemblance to those of the gazelle and kewel. But the form of the head is different; the muzzle is longer, and there are no pits under the eyes. The koba is much larger than the kob. The latter is about the size of a fallow-deer; and the former is as large as the stag. From the information of M. Adanson, it appears, that the koba is five feet long from the extremity of the muzzle to the origin of the tail; that the head is fifteen inches long, the ears nine, and the horns from nineteen to twenty; and that the horns are compressed on the sides, and surrounded with eleven or twelve rings; whilst those of the kob have only eight or nine rings, and exceed not a foot in length.

The

smooth and sharp. The head is large and clumsy, being eighteen inches in length; the ears are seven inches long. The head and body are of a light reddish brown. Down the hind part of the neck, there is a narrow black list. The rump is a dirty white. On each knee, and above the fetlock, there is a dusky mark. The hoofs are small. The tail is a foot long, covered with coarse black hairs, which hang far beyond the end. The length of the whole skin, which I bought at Amsterdam, was seven feet; *Pennant's Synops. of quad. p. 38.*

* The horns of the *kob*, or Gambian antelope, are thirteen inches long, five inches and a half round at the bottom, very distant in the middle, and pretty close at the base and points. They are surrounded with eight or nine rings, and are smooth at their upper part; *Pennant's Synops. of quad. p. 39.*

The seventh antelope is found in the Levant, and still more commonly in Egypt * and in Arabia. We shall call it by its Arabian name, *Algazel* †. The figure of this animal is nearly the same with that of the other antilopes, and it is about the size of the fallow deer. But its horns

* *Gazella Indica* cornibus rectis, longissimis, nigris, prope caput tantum annulatis; cornua tres propemodum pedes longa, recta, prope imum seu basin tantum circulis seu annulis eminentibus cincta, reliqua parte tota glabra et nigricantia. Animal ipsum ad cervi platycerotis, *Damae* vulgo dicti, magnitudinem accedit, pilo cinereo, cauda pedem circiter longa, pilis longis innascentibus hirta. Haec *D. Tancred Robinson*, e pelle animalis suffulta in regiae societatis museo suspensa. Caeterum hujus animalis cornua pluries vidimus in museis curiosorum; *Raii syn. quad. p. 79. Note.* Naturalists have improperly applied the appellation of *Indian Antelope* to this species. It will afterwards appear, from the evidence of travellers, that it is only found in Egypt, Arabia, and the Levant.

Gazellae quibus *Egyptus* abundat; *Prosper. Alp. hist. Egypt. p. 232.*

† The bezoar antelope has very long, slender, upright horns, bending at the upper part inward towards each other; some of them are much annulated, others smoother. It is of the size of a goat, and is red, mixed with ash-colour. It inhabits the inhospitable and rough mountains of Laar in Persia, and is one of the animals which produce the bezoar; *Pennant's synopsis, of quad. p. 26.*

Pafen, capricerva; Kempfer. Amoen. exot. p. 398.

Cornu innotum; Gesner. quad. p. 309.

La Gazelle; Belon. Observ. p. 120. Alpin. Hist. Ægypt. tom. 1. p. 232, tab. 14.

Animal bezoarticum; Raii synopsis. quad. p. 80.

La gazelle du bezoar; Brisson. quad. p. 44.

Capra bezoartica, cornibus teretibus, arcuatis, totis annularibus, gula barbata; Linn. syst. nat. p. 96.

horns are very long, pretty thin, and they bend little till toward their extremities. They are black and almost smooth, the rings being very slight, except near the base, where they are better marked. They are near three feet in length, while those of the gazelle or common antilope exceed not one foot; those of the kewel are fourteen or fifteen inches; and those of the corine are only six or seven inches.

The eighth animal is commonly called the *bezoar antilope**; and it is denominated *Pafon* by the eastern nations, which last name we shall preserve. The horns of this antilope are very well represented in the German Ephemerides †, and

* The Egyptian antilope has straight slender horns, near three feet long, and annulated. At their base, there is a triangular black spot, bounded on each side with white. A black line extends from the neck to the loins. The neck, back, and sides are of a dark gray colour. The breast and belly are white. The tail is about two feet long, terminated with black hairs. The length of the whole skin is six feet; *Pennant's synopsis of quad. p. 25.*

Gazella Indica cornibus rectis, longissimis, nigris, prope caput tantum annulatis; Raii synopsis. quad. p. 79.

Capra gazella, cornibus teretibus, rectissimis, longissimis, basi annulatis; Linn. syst. nat. p. 96.

La gazelle des Indes; *Brisson. quad p. 43.*

† *Missum mihi Hamburgo his diebus fuit ab amico—— Schellamero——cornu——capri Bezoardici.——Longitudine et facie qua hic depingitur, durum ac rigidum. fibris rectis per longitudinem cornu excurrentibus tanquam callis (nescio an aetatis indicibus) ad medium circiter, ubi sensim elanguescunt quasi, aut planiores redduntur, exasperatum; intus cavum, pendens uncias octo cum duabus drachmis.*
——*Jacobus*

and the figure of it is given by Kœmpfer *. But, in this figure, the horns are neither sufficiently long nor straight. Besides, his description is by no means exact ; for he says that this bezoar animal has a beard like the he-goat, though he has given it no beard in his figure ; which is more consonant to truth, the want of a beard being the chief characteristic by which the antilopes are distinguished from the goats. This antelope is of the size of our domestic he-goat, and it resembles the stag in figure, colour, and agility. Beside two separate horns, we have seen a head of this animal to which the horns were attached. The horns engraven in Aldrovandus's work have a great resemblance to those of the pafan. In general, the algazel and pafan seem to be very nearly allied. They likewise belong to the same climate, and are found in the Levant, Egypt, Persia, Arabia, &c. But the algazel inhabits the plains, and the pafan the mountains. The flesh of both is excellent.

The ninth antelope is an animal, which, according to M. Adanson, is called *Nanguer* or *Nan-*
 VOL. VI. F f f *guer*

—Jacobus Bontius (lib 1. de med. Indorum, notis ad cap. 45.) Videtur figuræ Bezoardici cornu mei propius accedere dum ita scribit : ‘ Caprae istae non absimiles valde sunt capris Europaeis, nisi quod habeant erecta ac longiora cornua,’ &c. De cornu capri Bezoardici ; *Obs. Jo. Dan. Majoris. Ephemer. ann. 8.*

* Koempfer, *Amoenitates*, p. 398.—In Persia, this kind of antelope is very numerous, and is called *Bazan*, and the stone itself *Bazar* ; *Voyage de la Compagnie des Indes de Hollande, tom. 2. p. 121.*

guer in Senegal *. It is three feet and a half in length, and two feet and a half in height. It is of the figure and colour of a roebuck, being yellow on the upper part of the body, white on the belly and thighs, with a white spot under the neck. Its horns are permanent, like those of the other antilopes, and exceed not six or seven inches in length. They are black and round; but, what is singular, they bend forward at the points, nearly in the same manner as those of the chamois goat bend backward. The nanguer, or swift antilope, is a very handsome animal, and easily tamed. All these characters, and chiefly that of the horns bending forward, incline me to think that the nanguer may be the *dama* or fallow deer of the antients. ‘*Cornua rupicapris in dorsum adunca, damis in adversum,*’ says Pliny †. Now, the nanguers are the only animals whose horns are bended in this manner; we may therefore presume, that the nanguer of Africa is the *dama* of the antients, especially as we learn from another passage of
Pliny,

* The *Swift* antilope has round horns, eight inches long, and reverted at their ends. The length of the animal is three feet ten inches, the height two feet eight inches. The general colour is tawny. The belly, lower part of the sides, rump, and thighs, are white. On the fore part of the neck, there is a white spot. But this species varies in colour.

Dama; *Plinii, lib. 11. c. 37.*

Cemas; *Elian. An. lib. 14. c. 14.*

Antilope dama; *Pallas Miscell. 5. spicil. 8.*

† *Hist. Nat. lib. 11. cap. 37.*

Pliny*, that the dama was found only in Africa. In fine, from the testimony of other antient authors †, we see that the dama was a timid, gentle animal, and had no other resources but in the swiftness of its course. The animal described and engraven by Caius, under the name of *dama Plinii*, being found, according to the testimony of the same author, in the North of Great Britain and in Spain, could not be the dama of Pliny, since he tells us that it was only to be met with in Africa ‡. Besides, the animal drawn by Caius has a beard like a goat; but none of the antients mention the dama as having a beard. Hence I am led to think, that the dama described by Caius, is only a goat, whose horns being a little bended at the points, like those of the common antelope, made him imagine it to be the dama of the antients. Besides, the horns bended forward, which is the distinguishing character of the dama of the antients, are well marked in the nanguer of Africa only. We are likewise informed by M. Adanson, that there are three varieties

* Sunt et damae, et pygargi, et strepsicerotes.——Haec transmarini situs mittunt; *Hist. Nat. lib. 8. cap. 53.*

† Horace, Virgil, Martial, &c.

‡ Haec icon Damae est quam ex caprarum genere indicat pilus, aruncus, figura corporis atque cornua, nisi quod his in adversum adunca, cum caeteris in aversum acta sint. Caprae magnitudine est dama et colore Dorcadis.——Est amicus quidam meus Anglus, qui mihi certa fide retulit in partibus Britanniae septentrionalibus eam reperiri, sed adventitiam. Vidit is apud nobilem quemdam cui dono dabatur; accepi a quibusdam eam in Hispania nasci; *Caius et Gesner, hist. quad. p. 306:*

varieties of those nanguers, which differ only in colour; but all their horns are more or less bended forward.

The tenth gazelle is an animal very common in Barbary and Mauritania, and is called *the antilope** by the British, which name I shall preserve. It is of the size of our largest roebucks. Though it has a great resemblance to the gazelle and kewel; yet it differs in so many characters, that it ought to be regarded as a distinct species. The pits below the eyes are larger in the *antilope* than in the gazelle. Its horns are almost fourteen inches long; and, though they almost touch at the base, yet their points are fifteen or sixteen inches asunder. They are surrounded with rings and half rings, which are less

* The *common antilope* has upright horns, twisted spirally, and surrounded almost to the top with prominent rings: They are about sixteen inches long, and twelve inches distant between point and point. In size, it is rather less than the fallow deer or buck. The colour is brown mixed with red, and dusky. The belly and inside of the thighs are white. The tail is short, black above, and white beneath. The females want horns; *Pennant's synopsis of quad. p. 32.*

Strepsiceros; Plinii. Hist. nat. lib. 8. c. 53. & lib. 11. c. 37.

Gazelle; Mem. pour servir à l'hist. des anim. part. 1. p. 95. fig. 11.

Gazella Africana, the antilope; Raii synopsis quad. p. 79.

Hircus cornibus teretibus, dimidiato annulatis, bis arcuatis; Brisson. quad. p. 44.

Tragus strepsiceros; Klein. quad. p. 18.

Capra cervicapra, cornibus teretibus, dimidiato-annulatis, flexuosis, contortis; Linn. syst. nat. p. 96.

Antilope cervicapra; Pallas Miscell. p. 9. spicil. 18. tab. 1. & 2.

less raised than those of the gazelle and kevel; and, what is peculiar to the *antilope*, its horns have a remarkably beautiful double flexion, which gives them the appearance of the antient lyre. The hair of the *antilope*, like that of the other gazelles, is yellow on the back, and white on the belly: But these two colours are not separated below the flanks by a brown or black band, as in the gazelle, kevel, corine, &c. We have only a skeleton of this animal in the royal cabinet.

In the *antilope*, as well as the other gazelles, there seem to be different races. 1. In the royal cabinet, there is a horn which can only be attributed to an antilope of a much larger size than that we have been describing. We shall adopt the name *Lidmée* *, which, according to Dr Shaw †, the Africans apply to the *Antilopes*. 2. We have seen in the cabinet of the Marquis de Marigny, whose taste extends both to the fine arts and to the history of Nature, a kind of offensive

* The *Lidmée*, or brown antilope, is less than a roebuck; its horns resemble those of the last. Its face, back, and sides, are of a very deep brown, the last bordered with tawny. The belly and inside of the legs are white. Above each hoof, there is a black spot. The tail is black above, and white beneath; *Pennant's synopsis of quadr.* p. 32.

† Besides the common gazelle or antilope, (which is well known in Europe,) this country likewise produceth another species, of the same shape and colour, though of the bigness of our roebuck, and with horns sometimes of two feet long. This the Africans call *Lidmée*, and may, I presume, be the *Strepsiceros* and *Adace* of the antients; *Shaw's travels*, p. 243.

offensive weapon, composed of two sharp horns, about a foot and a half long, which, from their double flexion, appear to belong to an *antilope* smaller than the others*. It must be very common in India; for the Priests † carry this kind of weapon as a mark of dignity. We shall call it the *Indian antilope*, because it appears to be only a simple variety of the African species.

Thus, among the gazelles or antilopes, we have discovered twelve species, or distinct varieties. 1. The common gazelle; 2. The kewel; 3. The corine; 4. The tzeiran; 5. The koba, or great brown cow; 6. The kob, or small brown cow; 7. The algazel, or Egyptian antilope; 8. The pafan, or pretended bezoar animal; 9. The nanguer, or dama of the antients; 10. The *antilope*; 11. The lidmée; 12. The *Indian antilope*. After a careful comparison of these twelve animals among themselves,

* Mr Pennant calls this the *smooth-horned antilope*; *Synops. of quad. p. 33.*

† The Indian antilopes are not entirely like those of other countries. They have more spirit; and are distinguishable by their horns. In the common antilopes, the horns are gray, and not half so long as those of India, which are black, and more than a foot and a half in length. They are twisted, as far as the points, like a screw. The Faquirs and Santons generally carry two of them joined together in a parallel direction, and use them as small batons; *Relat. du voyage de Thevenot, tom. 3. p. 111.*—Those in the Marquis de Marigny's cabinet are neither twisted nor annulated: They seem to have been polished from one end to the other.

selves, we are led to conclude, 1. That the common gazelle, the kevel, and the corine, are only three varieties of the same species; 2. That the tzeiran, koba, and kob, are varieties of another species; 3. That the algazel and pafan are probably two varieties of the same species; and that the name of *bezoar gazelle*, which has been given to the pafan, is not a distinctive character; for I shall afterwards prove, that the Oriental bezoar is not produced by the pafan alone, but by all the gazelles and goats which inhabit the mountains of Asia; 4. That the nanguers, whose horns are bended forward, and of which there are two or three varieties, have been pointed out by the antients under the name of *dama*; 5. That the *antilopes*, which are three or four in number, and differ from all the others by the double flexion of their horns, were likewise known to the antients, and mentioned under the names of *Strepsiceros* * and *addax*. All these animals are found in Asia and Africa. To these five principal species, which contain twelve distinct varieties, I will not add two or three other species of the New World, to which the vague name of *gazelle*, or *antilope*, has been given, though they differ from all those formerly taken notice of. This would be to augment a confusion which is already too great. In the subsequent

* Erecta autem cornua, rugarumque ambitu contorta, et in leve fastigium exarata (ut Lyras diceret) Strepsiceroti, quem Addacem Africa appellat; *Plin. Hist. nat. lib. 11. cap. 37.*

sequent article, we shall give the history of these American animals under their true names, *Mazame*, *Temamaçame*, &c. and shall here confine ourselves entirely to the animals of this genus which are found in Africa and Asia: For the same reason, we shall refer to the following article several other African and Asiatic animals, which have been regarded as antilopes or goats, though they appear to be intermediate species, such as the bubalus, or Barbary cow, the condoma, the guib, the grimm, &c. without including the chevrotains or musks, which have a great resemblance to the smallest goats or antilopes: Of these last we shall likewise make a separate article.

It is now easy to perceive the difficulty of arranging and distinguishing all these animals, which are thirty in number, ten goats, twelve or thirteen antilopes, three or four bubali, and as many musks. Many of them were unknown to the naturalists, or exhibited in promiscuous groups; and the whole have been confounded with each other by travellers. This, indeed, is the third time I have written the history of these animals; and, I acknowledge, that the labour overbalances the produce. I have the satisfaction, however, of having made every possible use of the knowledge and materials I could acquire.

With regard to the gazelles, from comparing all that has been said of them, both by the an-
tients

tients and moderns, with our own experience, we find, 1. That the *δορκας* of Aristotle is not the gazelle, but the roebuck; though the same word *δορκας* has been employed by Ælian, not only to denote the wild goats in general, but particularly the Lybian gazelle or Barbary antelope; 2. That the *strepficeros* of Pliny, or *addax* of the Africans, is the *antelope*; 3. That the *dama* of Pliny is the *nanguer* of Africa, and not our fallow deer, or any other European animal; 4. That the *περὶ* of Aristotle is the same with the *δορκας* of Ælian, and the *πλατυκερος* of the more modern Greeks; and that the Latins have used this word *platyceros* to denote the fallow deer; ‘animalium,’ says Pliny, ‘quorundam cornua in palmas finxit natura, digitosque emisit ex iis, unde *platycerotas* vocant;’ 5. That the *πυργαργος* of the Greeks is probably the Egyptian or Persian gazelle, that is, the *algazel* or *pasan*. The word *pygargus* is employed by Aristotle solely to denote the *white tailed eagle*; and Pliny has used the same word to denote a quadruped. Now, the etymology of *pygargus* indicates, 1. An animal with white thighs, such as the roebucks, or gazelles; 2. A timid animal; the ancients, imagining that white thighs indicated timidity, ascribed the intrepidity of Hercules to his having black thighs. But, as almost all the authors who speak of the *pygargus* as a quadruped, mention likewise the roebuck, it is obvious, that the name *pygargus* can only apply

to some species of gazelle different from the *dorcas Lybica*, or common gazelle, and from the *strepsiceros* or *antilope*, which are also mentioned by the same authors. We are, therefore, led to conclude, that the *pygargus* denotes the algazel or Egyptian gazelle, which must have been known to the Greeks as well as the Hebrews; for we find the name *pygargus* applied, in the Septuagint version *, to a quadruped which is reckoned among the pure animals whose flesh might be eaten. Hence the Jews eat the *pygargus*, or that species of gazelle which is most common in Egypt and the adjacent countries.

Dr Ruffel, in his Natural History of Aleppo, tells us, that, in the neighbourhood of that city, there are two kinds of gazelles. The one, called the *mountain gazelle*, which is the most beautiful, and whose hair on the neck and back is of a deep brown colour; the other, called *the gazelle of the plains*, which is neither so nimble, nor so handsome as the first, and whose hair is of a pale colour. He adds, that these animals are so swift, and run so long, that the best hounds cannot take them, without the assistance of a falcon; that, though the gazelles are meager in winter, their flesh is excellent; that, in summer, it is loaded with fat like that of the fallow deer; that those fed in houses are not such good eating as the wild ones, &c. From the testimonies

* Deutron. chap. 14.

nies of Mr Ruffel and of Hasselquist *, we learn that the gazelles of Aleppo are not the common

• *Capra Cervicapra. The rock goat.*

This is larger, swifter, and wilder, than the common rock goat, and can scarcely be taken without a falcon. It is met with near Aleppo. I have seen a variety of this, which is common in the East, and the horns appear different; perhaps it is a distinct species. This animal loves the smoke of tobacco, and, when caught alive, will approach the pipe of the huntsman, though otherwise more timid than any animal. This is perhaps the only creature, beside man, that delights in the smell of a poisonous and stinking plant. The Arabians hunt it with a falcon (*Falco gentilis*, Linn.) I had an excellent opportunity of seeing this sport near Nazareth, in Galilee. An Arab, mounting a swift courser, held the falcon on his hand, as huntsmen commonly do: When we espied the rock goat, on the top of a mountain, he let loose the falcon, which flew in a direct line, like an arrow, and attacked the animal, fixing the talons of one of his feet into the cheek of the creature, and the talons of the other into its throat, extending his wings obliquely over the animal; spreading one towards one of its ears, and the other to the opposite hip. The animal, thus attacked, made a leap twice the height of a man, and freed himself from the falcon; but, being wounded, and losing its strength and speed, it was again attacked by the falcon, which fixed the talons of both its feet into the throat of the animal, and held it fast, till the huntsman coming up, took it alive, and cut its throat; the falcon drinking the blood, as a reward for his labour; and a young falcon, which was learning, was likewise put to the throat of the goat; by this means are young falcons taught to fix their talons in the throat of the animal, as being the properest part; for, should the falcon fix them in the creature's hip, or some other part of the body, the huntsman would not only lose his game, but his falcon also: For the animal, roused by the wound, which could not prove mortal, would run to the deserts, and the tops of the mountains, whither its enemy keeping its hold, would be obliged to follow; and, being separated from its master, must of course perish; *Hasselquist, p. 190.*

mon kind, but the Egyptian gazelles, whose horns are upright, long, and black, and whose flesh is extremely good; and that they are half-domestic, having been often and very antiently tamed, which, of course, has given rise to a great number of varieties, or different races, as happens in all other domestic animals. These Aleppo gazelles, therefore, are the same with those we have called *algazelles*. They are still more common in the Thebaid and Upper Egypt, than in the environs of Aleppo. They feed upon aromatic herbs, and the buds of trees*. They generally go in flocks, or rather in families, consisting of five or six †. Their cry is similar to that of the goat. They are not only hunted with hounds, who are assisted by falcons, but by the small panther ‡, which we have called *ounce*. In some places,

* Relat. du Voyage fait ou Egypt, par Granger, p. 99.

† In Egypt there are a number of antilopes.—They commonly traverse the mountains in flocks. The hair and tail of these animals resemble those of the hind; and their fore-feet, which are short, resemble those of the fallow deer. Their horns are straight as far as the extremity, which is crooked. Their cry resembles that of the other goats; *Voyages de Paul Lucas, tom. 3. p. 199.*

‡ Venantur non minus et gazellas quibus Egyptus abundat, quarum carnes bonitate et gustu, crapreolorum carnibus similes existunt. Bifulcum animal est, silvestre, sed quod facile mansuefit, caprae simile, colore igneo ad pallidum inclinante, duplici cornu, longo, introverso lunae modo, et nigro; auribus arrectis, ut in cervis, oculis magnis, oblongis, nigris, pulcherrimis. Unde in adagio apud Egyptos dicitur de pulchris oculis

places, the gazelles are taken by means of tamed

oculis *ain el Gazel*, id est, oculus Gazellae: Collo longo et gracili, cruribus gracilibus atque pedibus bifurcis constat. Pantherae in desertis locis Gazellas venantur, quibus aliquandiu cornibus durissimis, acutisque resistent; sed victae eorum praeda fiunt. Pili quibus conteguntur, videntur sane similes iis qui in Moschiferis animalibus spectantur: Pulcherrimum est animal, quod facile hominibus redditur cicur mansuetumque; *Prosper. Alpin. Hist. Nat. Egypt. p. 232. tab. 14. Note.* From the figure given by Prosper Alpinus, it is obvious, that it is the *algazel* of which he is treating; and his description shows that the *algazel* is often, as well as the common gazelle and kewel, marked with white spots, like the civet.—In India there are numbers of gazelles, which resemble our fawns. They generally go in separate flocks, each consisting of five or six, and accompanied with a male, who is easily distinguished by his colour. When the hunters discover one of these flocks, they endeavour to point them out to the leopard, which they keep chained in a small cart. This cunning animal does not run straight upon them, but winds about, creeping and concealing himself, in order to approach and surprize them; and, as he is capable of making five or six bounds with inconceivable quickness, when he thinks himself near enough, he darts upon them, tears open the throat and breast, and gluts himself with their blood, heart, and liver. But, if he misses his aim, which often happens, he remains fixed on the spot. It would be in vain to attempt to seize them by running; for they run much swifter and continue much longer than he can do. His master then comes gently up to him, flatters him, and throws pieces of flesh to him. By amusing the animal in this manner, he is enabled to throw a cover over his eyes: After which, he chains him, and replaces him on the cart. In the course of our march, one of these leopards exhibited this sport to us, which alarmed several of our people. A flock of gazelles rose in the midst of the army, and, as often happens, they accidentally passed near the two leopards, which are commonly carried along on a small cart. One of them, which was not hood-

winked,

med. ones, with snares of ropes fixed to their horns*.

The antilopes, especially the larger kinds, are much more common in Africa than in India. They are stronger and fiercer than the other gazelles; and they are easily distinguished by the double flexion of their horns, and by the want of a black or brown band below the flanks. The middling antilopes are of the size of a fallow deer. Their horns are very black †, their belly pure white, and their fore legs are shorter than the hind legs. They are very numerous

winked, made such a spring, that he broke his chain, and darted after them, but without effect. However, as the gazelles were terrified, and chaced on all sides, one of them was again obliged to pass near the leopard, who, notwithstanding the whole road was embarrassed with camels and horses, and notwithstanding the common notion that this animal never attacks its prey after having once missed it, he sprung upon, and seized it; *Relat. de Thevenot, tom. 3. p. 112.*

* Instead of a leopard, a tamed gazelle is employed to catch the wild ones. Round his horns a rope is twisted in various directions, and the two ends of it are fixed under his belly. When the hunters discover a flock of gazelles, he is allowed to go and join them. But the male of the little flock advances to prevent him: This opposition he makes with his horns, which are soon entangled in the mesh of ropes. He is then seized and carried off by the hunters; *Id. ibid.*—The same art is employed in taking the females. A domestic female with a netting of cords is let loose among a flock. The wild females immediately begin to sport with her; and the horns of one of them are soon entangled; and she falls an easy prey to the Indians; *Voyage de la Boullaye-le-Gouz, p. 247.*

† L'Afrique de Marmol, tom. 1. p. 53. and Shaw's travels.

merous in Tremecen, Duguela, Tell, and Zaa-ra. They are cleanly animals, and never lie down but in dry places. They are also extremely nimble, vigilant, and timorous. In open places, they look round on all sides; and, as soon as they perceive a man, a dog, or any other enemy, they fly off with full speed. But, notwithstanding this natural timidity, they have a kind of courage; for, when surprised, they stop short, and face those who attack them.

In general, the eyes of the gazelles are black, large, vivacious, and, at the same time, so beautiful, that, in the Eastern nations, they are employed proverbially in praising the eyes of a fine woman *. Their limbs are finer and more delicate than those of the roebuck. Their hair is short, soft, and lustrous. Their fore legs are not so long as the hind ones, which enables them, like the hare, to run with greater facility up than down hill. Their swiftness is equal to that of the roebuck; but the latter rather leaps than runs, whereas all the gazelles run uniformly †. Most of them are yellow on the back and white

* In the neighbourhood of Alexandria, the antilopes are very numerous. This animal is a species of roebuck, whose eyes are so large, vivacious, and piercing, that they are used figuratively in praising the eyes of the ladies; *Descript. de l'Égypt. par Maillet, tom. 2. p. 125.*

† The hair of the *gierans* or *gazelles* is like that of the fallow-deer, and they run, like the dog, without leaping. In the night, they come to feed in the plains, and, in the morning, return to the mountains; *Voyage de Gemelli Careri, tom. 2. p. 64.*

white on the belly, and have a brown band which separates these two colours below the flanks. Their tails are of different lengths, but always garnished with pretty long black hair. Their ears are long, erect, pretty open in the middle, and terminate in a point. Their feet are cloven, and shaped nearly like those of the sheep. Both males and females have permanent horns; but those of the females are thinner and shorter.

These are all the the facts we have been able to collect concerning the different species of gazelles, and their natural dispositions and manners. We shall now inquire with what propriety naturalists have ascribed to one of those animals only, the production of the famous stone, called the *Oriental bezoar*, and whether this animal be the *pafen* or *pazan*, which they have mentioned specifically under the name of the *bezoar gazelle*. In examining the figures and description * given by Koempfer, who has written
 much

† Repertus in novenni hirco lapillus voti me fecit quodammodo competens; dico quodammodo, nam in bestia quam comes meus fidebat, intestina, a me ipso diligentissime perquisita, nullum lapidem continebant. Prior alteri apparebat fortuna qui a nobis longius remotus feram a se transfossam dum me non expectato dissecaret, lapillum reperit elegantissimum, tametsi molis perexiguæ.——Adeptus lapidem, antequam adesset.——*Koempfer, amoenit. p. 392.*——Bezoard orientalis legitimus. Lapis bezoard orientalis verus et pretiosus, Persice Pasahr, ex quo nobis vox bezoard enata est.—Patria ejus precipua est Persidis provincia Laar.—Ferax præterea Chorasmia esse dicitur.—Genitrix, est fera quaedam montana caprini
 generis

much on this subject, it is doubtful whether he means that the pazan or the algazel is the on-

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generis quam incolae *Pafen*, nostrates capricervam nominant.

—Animal pilis brevibus ex cinereo rufis vestitur, magnitudine caprae domesticae, ejusdemque *barbatum* caput obtinens. Cornua foeminae *nulla* sunt vel exigua, hircus longiora et liberalius extensa gerit, annulisque distincta insignioribus, quorum numeri annos aetatis referunt: Annum undecimum vel duodecimum raro exhibere dicuntur, adeoque illum aetatis annum haud excedere. Reliquum corpus a cervina forma, colore, et agilitate nil differt. Timidissimum et maxime fugitivum est, inhospita asperiorum montium tesqua incolens, et ex solitudine montana in campos rarissime descendens, et quamvis pluris regni regiones inhabitet, lapides tamen bezoardicos non gignit. *Casbini* (emporium est regionis *Irak*) pro coquina nobis capricervam, vel, ut rectius dicam, Hircocervum praegrandem vendebat venator, qui a me quaestus, non audivisse te respondebat bestiam illic lapidem unquam sosisse, quod et civium, quotquot percunctatus sum, testimonia confirmabant.

—Quae vero partes, tametsi capricervas alant promiscue, non omnes tamen herbas ferunt ex quibus depastis lapides generari, atque ii quidem aequae nobiles possint, sed solus ex earum numero est mons *Baarsi*. — Nulla ibi ex praedictis bestiis datur aetate proventa quae lapidem non contineat; cum in caeteris hujus jugi partibus (ductorum verba refero) ex denis in montium distantioribus, ex quinquagenis in caeteris, extra *Larensem* provinciam ex centenis vix una sit quae lapide dotetur, eoque ut plurimum exigui valoris. In hircis lapides majores et frequentius inveniuntur quam in foeminis. Lapidem ferre judicantur annosi, valde macilenti, colla habentes longiora, qui gregem praecire gestiunt. — Bestiae ut primum perfoesae linguam inspiciunt, quae si solito deprehendatur asperior, de praesente lapide nihil amplius dubitant. Locus natalis est pylorus sive productior quarti quem vocant ventriculi fundus, cujus ad latus plica quaedam sive scrobiculus, mucoso humore oblitus, lapillum suggerit: In alia ventriculi classe (prout ruminantibus distinguuntur) quatenus ultima hac inveniri negabant. — Credunt quos plicarum alveoli

by animal which produces the *Oriental bezoar* *. If we consult the other naturalists and travellers, we shall be tempted to believe that all the gazelles, wild and domestic goats, and even the sheep, indiscriminately produce this stone, the formation of which depends more, perhaps, on the

alveoli non satis amplectuntur elabi pyloro posse, et cum excrementis excerni: Quin formatos interdum dissolvi rursus, praesertim longiori animalis inedia. *Clar. Jagerus* mihi testatus est se, dum in regno Golkonda degeret, gazellas vivas recenter captas manu sua perquisivisse, et contracto abdomine lapillos palpasse, in una geminos, in altera quinos vel fenos. Has ille bestias pro contemplatione sua alere decreverat, camera hospicii sui inclusas; verum quod ab omni pabulo obstitnerent, quasi perire quam saginari captivae mallent, mactari eas iussit, inedia aliquot dierum macentes. Tum vero lapillos ubi exempturus erat eorum ne vestigium amplius invenit, ex quo illos a jejuno viscere, vel alio quocumque modo, dissolutos credebat.— Dissolutionem nullo posse negotio fieri persuadeor, si quidem certum est lapides in loco natali viventis bruti dum latent nondum gaudere petrosa quam nobis exhibent duritie, sed molliores esse et quodammodo friabiles, instar fere vitelli ovi fervente aqua ad duritiem longius excocti. Hoc propter recenter exsectus ne improvide frangatur, vel attractus nitorem perdat, ab inventoribus consuevit ore recipi, et in eo foveri aliquandiu dum induruerit, mox gossypio involvi et asservari. Asservatio ni primis diebus caute fiant, periculum est ne adhuc cum infirmior, importuna contrectatione, rumpatur aut labem recipiat. Generationem fieri conjiciunt cum resinosa quaedam ex herbis depastis concoctisque substantia ventriculorum latera occupat, quae, egestis cibus, jejunoque viscere in pylorum confluens, circa arreptum calculum, lanam, paleamve consistat et coaguletur; ex primo circa materiam contentam flamine efformandi lapidis figura pendet, &c.; *Idem.* p. 389. et seq.

* At Golconda, the King has great store of excellent bezoars. The mountains where the goats feed which produce these

the temperature of the climate, than on the nature or species of the animal. If we may believe

these stones, are about seven or eight days journey from Bagnagaar. They commonly sell at forty crowns a pound; and the longest kind are the best. They are likewise found in certain cows, which are much larger, though not so valuable as those produced by the goats. The bezoars extracted from a rare kind of apes, which are small and long, are in the highest estimation; *Voyage de Thevenot, tom. 3. p. 293.*—Persia produces finer Bezoar stones than any other country of the world. They are extracted from the sides of certain wild he-goats, to the livers of which they are attached; *Voyage de Fones, p. 44.*—The bezoar, that famous medicinal stone, ought to be ranked among the number of drugs. It is a tender stone, consisting of coats or pellicles, like an onion. It is found in the bodies of the wild and domestic goats along the gulf of Persia, in the province of Corasson, which is the ancient Margiana, and is incomparably better than that brought from the kingdom of Golconda. But, as the goats were brought from a distance of three days journey, we found bezoars in some of them only, and even that in small quantities. We preserved these goats alive fifteen days. They were fed with common green herbage; but, upon opening them, nothing was found. I kept them during this time, in order to discover whether, as is alledged, it be a particular herb which heats these animal, and produces this stone in their bodies. We are told by the natives of Persia, that the more this animal pastures in parched countries, and eats dry and aromatic herbs, the bezoar is the more salutary. Corasson and the borders of the Persian gulf are the driest countries in the world. In the heart of these stones, there are always pieces of brambles, or some other vegetable, that serve as a nucleus, round which the humour that composes this stone coagulates. It is worthy of remark, that, in India, the she-goats produce bezoar, and that, in Persia, it is produced by the wedders and he-goats. The Persians esteem their own bezoar, being hotter and better concocted, as four times more valuable than the Indian kind. The former they sell at fifty-four livres the kou-
rag,

lieve Rumphius, Seba, and some other authors, the

rag, which is a weight of three drachms; *Voyage de Chardin, tom. 2. p. 16.*—The oriental bezoar comes from a northern province of the kingdom of Golconda, and is found in the stomach of the goats.—The peasants, by feeling the belly of the goat, know how many bezoars she has, and sell her in proportion to their number. This number they discover, by rubbing the sides of the stomach with their hands in such a manner as to bring all the contents towards the middle of it, and then they feel the stones distinctly.—The bezoar, like the diamond, is valued according to its size; for, if five or six bezoars weigh an ounce, they bring from fifteen to eighteen francs. But, if one bezoar weighs an ounce, it sells at one hundred francs. I sold one of four ounces and a half at two thousand livres.—The merchants who traffic in bezoars, brought me six of these goats, which I examined. It must be acknowledged that these animals are beautiful, very tall, and have hair as fine as silk.—I was told that one of these goats had but one bezoar in its stomach, and that others had two, three, or four, which I soon perceived to be true by rubbing their bellies in the manner above described. These six goats had seventeen bezoars and a half, one of which was about the size of half a hazel nut. The inside resembled the soft dung of a goat. These stones grow among the dung in the animal's belly. Some of the natives told me, that the bezoars were attached to the liver, and others, that they were fixed to the heart. From these vague assertions, I could not learn the truth.—With regard to the bezoar produced by the ape, it is so strong that two grains of it are reckoned equal to six of that produced by the goat; but it is very rare, and is found principally in the island of Macassar. This kind of bezoar is round; but the other is of different figures. These bezoars which are supposed to come from the apes, are much rarer than the other kind. They are also much dearer, and in greater request; and, when one is found of the size of a nut, it sometimes sells at more than a hundred crowns; *Voyage de Tavernier, tom. 4. p. 78.*

the true oriental bezoar, proceeds from apes, and not from gazelles, goats, or wedders *. But this notion of Rumphius and Seba is by
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* *De lapidibus bezoard orientalis.* Nondum certo innotuit, quibusnam in animalibus hi calculi reperiantur; sunt qui statuunt, eos in ventriculo certae caprarum speciei generari (Rains scilicet, Gesnerus, Tavernier, &c.) Rumphius, in *Musco Amboin.* refert Indos in risum effundi audientes, quod Europei sibi imaginentur, lapides bezoardicos in ventriculis caprarum sylvestrium generari; at contra ipsos affirmare, quod in *Simiis* crescant, nescios interim, quam in specie simiarum, an in Bavianis dictis, an vero in Cercopithecis. Attamen id certum esse, quod ex *Succadana* et *Tambas*, fitis in insula *Bornes*, adferantur, ibique a monticolis conquisiti vendantur iis qui littus accolunt; hos vero posteriores afferere, quod in certa *Simiarum* vel *Cercopithecorum* specie hi lapides nascantur; addere interim Indos, quod vel ipsi illi monticolae originem et loco natalia horumce lapidum nondum prope explorata habeant. Sciscitatus sum saepissime ab illis qui lapides istos ex Indiis Orientalibus huc transferunt, quonam de animali, et quibus e locis, hi proveniant; sed nihil inde certi potui expiscari, neque iis ipsis constabat quidpiam, nisi quod saltem ab aliis acceperant. Novi esse, qui longiusculos inter et sphaericos seu oblongo-rotundos, atque reniformes, dari quid discriminis statuunt. At imaginarium hoc est. Neque enim ulla ratione intrinsecus differunt, quando confringuntur aut in pulverem teruntur, modo fuerint genuini, nec, adulterati, sive demum ex simiis aut capris sylvestribus, aliisve proveniant animalibus. . . . Gaudent hi lapides nominibus, pro varietate linguarum, variis, Lusitanis, *Pedra* seu *Caliga* de *Buzio*; Sinesibus, *Gautsjo*; Maleitis, *Culiga-Kaka*; Persis, *Pazar*, *Pazan* seu *Belfahar*; Arabibus, *Albazar* et *Berzuaharth*; Lusitanis Indiae incolis, *Pedra-Bugia* seu *Lapides-Simiarum*, juxta Koempferi testimonium, vocantur. Credibile est nasci eisdem in stomacho, quum plerumque in centro straminum lignorumve particulae, nuclei, aut lapilli, et alia similia, inveniuntur tanquam prima rudimenta circum quae
acris,

no means well founded. We have seen several of these concretions, which are called *ape bezoars*. But they are totally different from the oriental bezoar, which unquestionably proceeds from a ruminating animal, and is easily distinguished, by its form and substance, from all the other bezoars. Its common colour is a greenish olive, and brownish within. The colour of what is called the *occidental bezoar*, is a faint yellow, more or less dirty. The substance of the former is more tender and porous, and that of the latter, harder, drier, and more petrified. Besides, as prodigious quantities of the oriental bezoar were consumed during the last two or three centuries, being used, both in Europe and Asia, in all cases where our physicians

acris, viscosa materies sese lamellatim applicat, et deinceps, crustae instar, magis magisque aucta in lapidem durefcit. Pro varietate victus, quo utuntur animalia, ipsae quoque lamellae variant, successive sibi mutuo adpositae, sensimque grandescentes. Fracto hae facile separantur, et per integrum saepe statum ita a se mutuo succedunt, ut decorticatum relinquunt lapidem, laevi iterum et quasi expolita superficie conspicuum. Lapides bezoard, illis e locis Indiae orientalis venientes quibus cum Britannis commercium intercedit, pro parte minuti sunt, et rotundi, silicumque quandam speciem in centro gerunt. Alii vero teneriores, et oblongi, intus continent straminula, nucleos dactylorum, femina peponum, et ejusmodi, quibus simplex saltem, aut geminum veri lapidis stratum, satis tenue, circumpositum est. Unde in his ultra dimidiam partem rejiculi datur: Et nobis quidem hi videntur veri esse simiarum lapides, utpote maturius ab hisce animantibus per anum excreti, quam ut majorem in molem potuerint excrefcere; *Seba*, vol. 2. p. 130.

cians now employ cordials and antidotes against poison, may we not presume, from this great consumption, which still continues in some degree, that the bezoar proceeds from a very common animal, or rather, that it proceeds not from one, but from several species ; and that it is equally extracted from gazelles, goats, and wedders ; but that these animals can only produce it in the climates of India and the Levant ?

From all that has been written on this subject, we have not been able to find one distinct observation, nor a single decisive argument. It only appears, from what has been said by Monard, Garcias, Clufius, Aldrovandus, Hernandes, &c. that the oriental bezoar animal is not the common domestic goat, but a species of wild goat, which they have not sufficiently characterised. In the same manner, all we can collect from Koempfer is, that the bezoar animal is a kind of wild goat, or rather gazelle, which is equally ill described. But, from the testimonies of Thevenot, Chardin, and Tavernier, we learn, that this stone is not so often extracted from the gazelles, as from the wedders, and the wild or domestic goats. These travellers merit the greater credit, because they were eye-witnesses to the facts they mention, and because, when treating of the bezoar, though they take no notice of the gazelles, yet, as they were well acquainted with these animals, and mention them in other parts of their works *, there is not the least appearance
of

* Voyage de Tavernier, tom. 2. p. 26.

of their having been deceived. We must not, therefore, conclude, like our antient naturalists, that the oriental bezoar is produced solely by a particular species of gazelle. I acknowledge, that, after having examined not only the evidence of travellers, but the facts themselves which might decide this question, I am inclined to believe that the bezoar stone proceeds equally from the most part of ruminating animals, but more commonly from goats and gazelles. It is formed of concentric coats or strata, and frequently contains foreign substances in its centre. I endeavoured to investigate the nature of these substances, which serve as a nucleus to the bezoar, in order to discover the animal that swallowed them. In the centre of these stones I found small flints, stones of plums, and of tamarinds, seeds of cassia, and especially pieces of straw and buds of trees. Hence I could no longer hesitate in attributing this production to animals which browse herbage and leaves.

We are persuaded, therefore, that the oriental bezoar proceeds not from any one, but from a number of different animals. Neither is it difficult to reconcile this opinion with the testimonies of travellers; for, though each of them contradicts his neighbour; yet all of them make near approaches to the truth. The bezoar was unknown to the antient Greeks and Latins. Galen is the first who mentions its virtues against poison. The Arabians speak of the bezoar

zoar as possessing the same virtues. But neither the Greeks, Latins, nor Arabians, give any precise information concerning the animals by which it is produced. Rabi Moses, the Egyptian, only remarks, that some people pretend that this stone is formed in the angle of the eye, and others in the gall-bladder of the Eastern wedders. Now, bezoars, or concretions, are actually formed in the angles of the eyes, and in the pits below the eyes of stags and some other animals. But these concretions are very different from the oriental bezoar; and all the concretions in the gall-bladder consist of a light, oily, and inflammable matter, which has no resemblance to the substance of the bezoar. Andreas Lacuna, a Spanish physician, in his commentaries on Dioscorides, remarks, that the oriental bezoar is extracted from a certain species of wild goat in the mountains of Persia. Amatus Lusitanus repeats Lacuna's remark; and adds, that this mountain goat resembles the stag. Monard, who quotes all the three, assures us in a more positive manner, that this stone is derived from the internal parts of a mountain goat in India, to which, says he, I may give the appellation of *cervi-capra*; because it partakes both of the stag and the goat, is nearly of the size and figure of the stag, and, like the goat, has simple horns, very much bended backward*. Garcias ab

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I i i

Horto

* *Lapis Bezaar* varias habet appellationes; nam Arabibus *Hager* dicitur, Persis *Bezaar*, Indis *Bezar*. . . . Ille lapis in internis

Horto tells us, that, in Coraffon and in Perfia, there is a species of he-goats *, called *pa-san*;

ternis partibus cujusdam animalis *Capra montana* appellati generat. . . . In Indiae supra Gangem certis montibus, Sinarum regioni vicinis, animalia cervis valde similia reperiuntur, tum magnitudine, tum agilitate et aliis notis, exceptis quibusdam partibus quibus cum capris magis conveniunt, ut cornibus quae veluti caprae in dorsum reflexa habent et corporis forma, unde nomen illis inditum cervicaprae, propter partes quas cum capris et cervis similes obtinent. . . . Est autem animal (ex eorum relatu qui ex illa regione redeunt animal conspexerunt) in quo reperiuntur isti lapides, cervi magnitudine et ejus quasi formae; binis dumtaxat cornibus praeditum, latis et extremo mucronatis atque in dorsum valde recurvis, breves pilos habens cineracei coloris ceu admixta rufedo: In iisdem montibus aliorum etiam colorum reperiuntur. Indi vel laqueis vel decipulis illa venantur et macant. Adeo autem ferocia sunt ut interdum Indos etiam occidant, agilia praeterea et ad saltum prona: In antris vivunt gregatimque eunt; utriusque sexus mares scilicet et foeminae inveniantur, vocemque gemebundam edunt. Lapidem autem ex interioribus intestinis aliisque cavis corporis partibus educunt. . . . Dum haec scriberem quoddam animal conspectu mihi huic (ni fallor) simile, quia omnes notas mihi habere videbatur quibus modo descripta praedita sunt; est autem ex longinquis regionibus per Africam Generoso Archidiacono Nebienfi delatum: Magnitudine cervi, capite et ore cervino, agile instar cervi, pili et color cervo similes; corporis forma capram refert, nam magno hirco simile est, hircinos pedes habens et bina cornua in dorsum inflexa, extrema parte contorta ut hircina videantur, reliquis autem partibus cervum aemulatur. Illud autem valde admirandum quod ex turre se praecipitans in cornua cadat sine ulla noxa: Vescitur herbis, pane, leguminibus, omnibusque cibis quae illi praebentur: Robustum est et ferrea catena vinctum, quia omnes funes quibus ligabatur rodebat et rumpebat; *Nic. Monardi de Lapide Bezoar. lib. interprete Carolo Clusio.*

* Est in Corafone et Perfia Hirci quoddam genus, quod *Pazan*

san *; that the oriental bezoar is generated in their stomachs; that this stone is found, not only in Persia, but likewise in Malacca, and in the Island of Cows near Cape Comorin; and that, in great numbers of these goats, slain for the subsistence of the troops, these stones were very commonly found. On this subject, Christopher Acoſta † repeats what had been said by Garcias and Monard,

Pazan lingua Persica vocant, rufi aut alterius coloris (ego rufum et praegrandem Goae vidi) mediocri altitudine, in cujus ventriculo fit hic lapis bezar. . . . Caeterum non solum generatur hic lapis in Persia, sed etiam nonnullis Malacae locis, et in insula quae a Vaccis nomen sumpsit, haud procul a promontorio Comorim. Nam cum *in exercitus annonam mactarentur isthic multi praegrandes birci, in eorum ventriculis magna ex parte hi lapides reperti sunt.* Hinc factum est, ut quotquot ab eo tempore in hanc insulam appellant, hircos obruncent, lapidesque ex iis tollant. Verum nulli Persicis bonitate comparari possunt. Dextri autem adeo sunt Mauritani, ut facile qua in regione nati sint singuli lapides, discernere et dijudicare possint. . . . Vocatur autem hic lapis *Pazar* a *Pazan*, id est, hircorum Arabibus, tum Persis et Corasone incolis: Nos corrupto nomine *Bezar*, atque Indi magis corrupti *Bazar* appellant, quasi dicas lapidem forenses: Nam *Bazar* eorum lingua forum est; *Garcias ab Horto, Aromat. Hist. interprete Carolo Clusio, p. 216.*

* Koempfer seems to have borrowed from Monard and Garcias, the names *cervi-capra*, *capri-cerva*, and *pasan*, which he has given to the oriental bezoar animal.

† Generatur iste lapis in ventriculis animalium hirco fere similibus, arietis praegrandis magnitudine, colore rufo, uti cervi propemodum agili, et acutissimi auditus, a Persis *Pazan* appellato, quod variis Indiae provinciis, uti in promontorio Comorim, et nonnullis Malacae locis, tum etiam in Persia et Corasone, insulisque quae a Vacca cognomen adeptae sunt, invenitur; *Christophori Acoſta, Aromat. liber, cap. 36. interprete Carolo Clusio, p. 279.*

nard, without offering any thing new. In fine, to omit nothing relative to the history of this stone, Koempfer, an intelligent man, and an exact observer, tells us, that, when in the province of Laar in Persia, he went with the natives of the country to hunt the buck *pafan*, which produces the bezoar; and that he saw the stone extracted; and he assures us, that the true oriental bezoar proceeds from this animal; that the buck *abu*, of which he also gives a figure, likewise produces bezoar, but that it is of an inferior quality. From the figures he has given of the *pafan* and *ahu*, we would be induced to think, that the first represents the common gazelle rather than the true *pafan*; and, from his description, we should imagine his *pafan* to be a he-goat, and not a gazelle, because he has given it a beard like the goats. Lastly, from the name *abu*, which he gives to his other buck, as well as from his second figure, we recognise the wild he-goat rather than the genuine *ahu*, which is our tzeiran or large gazelle. What is still more singular, Koempfer, who seems willing to determine the species of the oriental bezoar animal, and who assures us that it is the wild buck called *pafan*, quotes, at the same time, a man who, he says, is very worthy of credit, and who affirms, that he felt the bezoars in the belly of the gazelle, at Golconda. Thus, all the positive evidence which can be derived from Koempfer is reduced to this, that there are two species of wild mountain-goats, the

the pafan and ahu, which produce the bezoar in Perfia, and that in India this ftone is likewise found in the gazelles. Chardin remarks, that the oriental bezoar is found in the bucks and she-goats, both wild and domestic, along the Perfic Gulf, and in feveral provinces of India; but that, in Perfia, it is alfo extracted from the wedders. The Dutch travellers alfo affert *, that it is produced in the ftomachs of fheep and goats. Tavernier, who is ftill more pofitive in favour of the domeftic goats, fays, that their hair is as fine as filk, and that, having purchafed fix of thefe goats alive, he extracted from them feventeen entire bezoars, and a piece of another as large as half a filbered nut. He then adds, that there are other bezoars fupposed to proceed from apes, whole virtues are ftill ftonger than thofe of the goat-bezoars; that they are alfo extracted from cows; but the virtues of thefe are inferior, &c. What can be inferred from this variety of evidence and opinions, unlefs it be allowed that the oriental

* In the ifland of Bofner, we find the famous bezoar ftone, which is very precious and in great request, on account of its virtue againft poifon. It is formed, in the ftomachs of fheep or goats, round a fmall pufule or protuberance in the middle of the ftomach, and which is found in the ftone itfelf. . . . A conjecture has been formed, that the bezoar which proceeds from the ftomach of the fheep, and the gall-bladder ftone of the hóg, are produced by the operation of fome particular herbs eaten by thefe animals. But they are found in all the countries of the Eaft-Indies, though thefe animals feed promifcuoufly upon herbage of every kind. See *Voyage de la Compagn. des Indes de Hollande*, tom. 2. p. 121: and alfo *Le Voyage de Mandeflo*, tom. 2. p. 364.

oriental bezoar proceeds not from one species, but from a number of different animals, and especially from the gazelles and goats?

With regard to the occidental bezoars, we hesitate not to pronounce, that they are produced neither by goats nor gazelles; for it will be shown, in the subsequent articles, that there are neither goats, gazelles, nor even any animal which approaches to this genus, throughout the whole extent of the New World. Instead of gazelles, we find roebucks alone in the woods of America; instead of wild goats and sheep, lamas and pacos*, animals totally different, are to be found in the mountains of Peru and Chili. The antient Peruvians had no other cattle; and, at the same time that these two species were partly reduced to a domestic state, they existed, in still greater numbers, in their natural condition of liberty on the mountains. The wild lamas were called *huanacus*, and the pacos *vicunnas*, from which has been derived the name *vigogne*, that denotes the same animal with the pacos. Both the lamas and the pacos produce bezoars; but the domestic kind produce them more rarely than the wild.

M. Daubenton, who has investigated the nature of bezoar stones more closely than any other person, thinks that they are composed of the same matter as that shining coloured tartar which adheres

* See vol. V. art. *Of the animals peculiar to the New Continent.*

adheres to the teeth of ruminating animals; and it appears, from the numerous collection of bezoars in the royal cabinet, that there are essential differences between the oriental and occidental bezoars. Hence the goats of the East Indies, and the gazelles of Persia, are not the only animals which produce the concretions called *bezoars*. The chamois *, and perhaps the wild goat of the Alps, the he-goats of Guiney †, and several American animals ‡, likewise produce bezoars: And, under this

* In the country of the Grisons, balls as large, and sometimes larger, than a tennis-ball, are found in the stomach of the chamois goat. They are called *kemskougnel* by the Germans, who alledge that they are as useful as the bezoar, which likewise proceeds from the stomachs of certain Indian goats; *Travels to Italy, &c. by Jacob Spon and George Wheeler.*—Near Munich, in a village called *Lagrem*, which is at the foot of the mountains, our host shewed us certain balls or brown masses, nearly of the size of a hen's egg, which were a kind of tender, imperfect bezoar, commonly found in the stomachs of the *roebucks*. He assured us, that these balls had great virtues, and that he often sold them to strangers at ten crowns a piece; *Voyage des Missionnaires, tom. 1. p. 129.*

† In Congo and Angola, when the wild goats begin to grow old, stones, resembling the bezoar, are found in their bellies. Those found in the males are supposed to be best; and the Negroes boast of them as specifics against many distempers, and particularly against the effects of poison; *Hist. gen. des Voyages per M. l'Abbé Prevost, tom. 5. p. 83.*

‡ *Accipimus a peritis venatoribus, reperiri lapides bezoard in ovibus illis Peruinis cornuum expertibus, quas Bicuinas vocant; (sunt enim alia cornuta Tarucae vocatae, et aliae quas dicunt Guanacas) praeterea in Teublalmaçame quae caprarum mediocrium paulove majori constant magnitudine. . . .* Deinde

this name, if we comprehend all similar concretions found in the intestines of animals, we may affirm, that most quadrupeds, except those of the carnivorous kinds, and even the crocodiles and large serpents, produce bezoars*.

To

de in quodam damarum genere quas *Macatlbichiltic* aut *Temamaçame* appellant. . . . Necnon in ibicibus quorum hic redundat copia, ut Hispanos et apud hanc regionem frequentes cervos taceam, in quibus quoque est lapidem, de quo praeferens est institutus sermo, reperire: Capreas etiam cornuum expertes quas audio passim reperiri apud Peruvios, et ut summatim dicam, vix est cervorum caprearumque genus ullum, in cujus ventriculo, aliave interna parte, sua sponte, ex ipsis alimoniae excrementis, lapis hic, qui etiam in tauris vaccisque solet offendi, non paulatim concresecat et generetur, multis sensim additis et cohaerescens membranulis, quales sunt caeparum. Ideo non nisi vetustissimis et senio pene confectis lapides hi reperiuntur; neque ubique, sed certis statisque locis. . . . Variis hos lapides reperies formis et coloribus; alios nempe candescentes, fuscis alios, alios luteos, quosdam cinereos nigrosque, et vitri aut obsidiani lapidis modo micantes. Hos ovi illos rotunda figura, et alios triangula, &c. *Narr. Ant. Recchi. apud Hernand. p. 325. et 326.*—In the stomach of a wild goat, called *Cornera de terra* by the Spaniards, Wafer found thirteen bezoar stones of different figures, some of which resembled coral. Though perfectly green when first exposed to the air, they afterwards turned ash-coloured; *Hist. gen. des voyages par M. l'Abbé Prevost, tom. 12. p. 638.* *Nota,* This *cornera de terra* is neither a goat nor gazelle, but the *lama* of Peru.

* There is another stone, called the *stone of the hooded serpent*, a species of serpent which has a kind of hood hanging behind its head. . . . and, behind this hood, the stone is found, the smallest being as large as a hen's egg. . . . These serpents frequent the coasts of Melinda, and the stones might be brought by the Portuguese sailors or soldiers, when they return from Mosambique; *Voyage de Tavernier, tom. 4. p. 80.*

To obtain a clear idea of these concretions, they must be distributed into several classes, referring to the animals which produce them, and the climates and food that are favourable to their production.

1. The stones formed in the bladder and kidneys of men and other animals must be separated from the class of bezoars, and denominated by the appellation of *calculi*, their substance being totally different from that of the bezoars. They are easily distinguished by their weight, their urinous odour, and their structure, which is neither regular, nor composed of thin concentric circles, like that of the bezoars.

2. The concretions sometimes found in the gall-bladder and liver of men and animals should not be regarded as bezoars. They may be distinguished by their lightness, their colour, and their inflammability; besides, they are not formed of concentric circles round a nucleus.

3. The balls frequently found in the stomachs of animals, and especially of the ruminating kinds, are not true bezoars. These balls, which are called *Ægagropili*, are composed, internally, of hairs swallowed by the animal when licking itself, or of hard roots which it was unable to digest; and, externally, most of them are covered with a viscid substance, which has some resemblance to bezoar. Hence the *ægagropili* have nothing in common with the bezoars but this external

covering ; and inspection alone is sufficient to distinguish the one from the other.

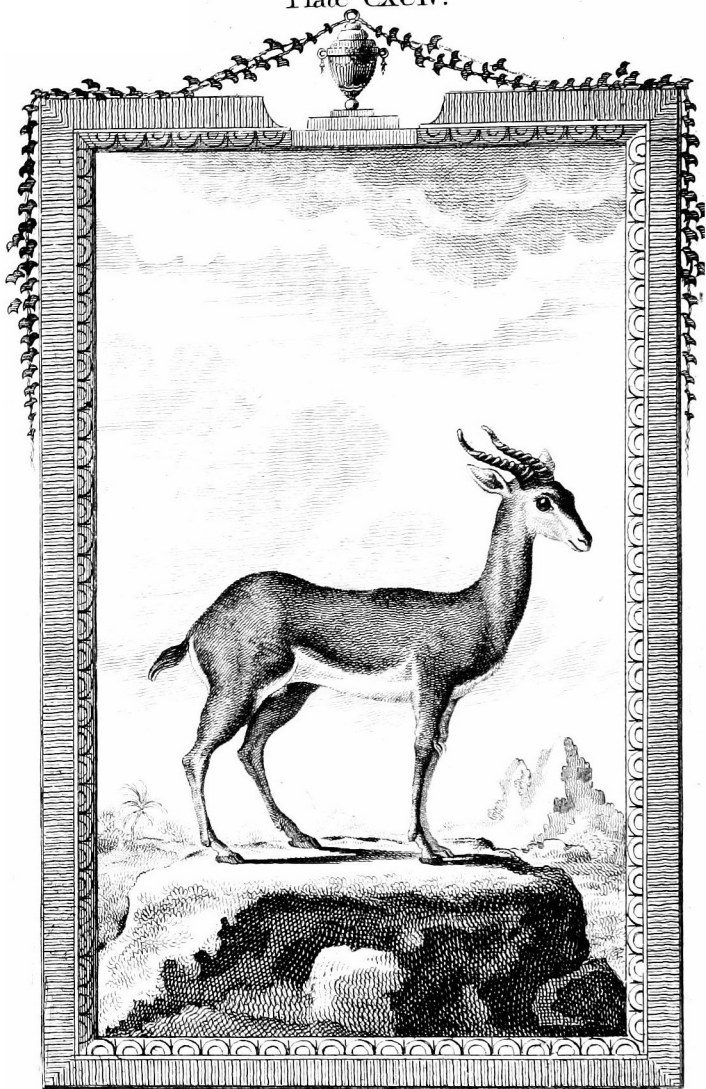
4. In temperate climates, we often find *aegagropili* in animals, but never bezoars. Our oxen and cows, the Alpine chamois *, and the Italian porcupine †, produce only *aegagropili*. The animals of hot countries, on the contrary, yield only bezoars. The elephant, the rhinoceros, the goats and gazelles of Asia and Africa, the lama of Peru, &c. instead of *aegagropili*, produce solid bezoars, whose size and consistence vary according to the animals and the climates under which they live.

5. The bezoars, to which so many virtues have been ascribed, are the oriental kind, and they are produced by the goats, gazelles, and sheep, that inhabit the high mountains of Asia. Bezoars of an inferior quality, which are called *occidental*, proceed from the lamas and pacas who are found in the mountains of South America. In fine, the goats and gazelles of Africa likewise yield bezoars; but they are not so good as those of Asia.

From all these facts we may conclude, in general, that the bezoars are only a residue of vegetable nourishment, which exists not in carnivorous animals, and is peculiar to those who live upon plants; that, in the southern mountains of Asia, the herbs being stronger and more
exalted

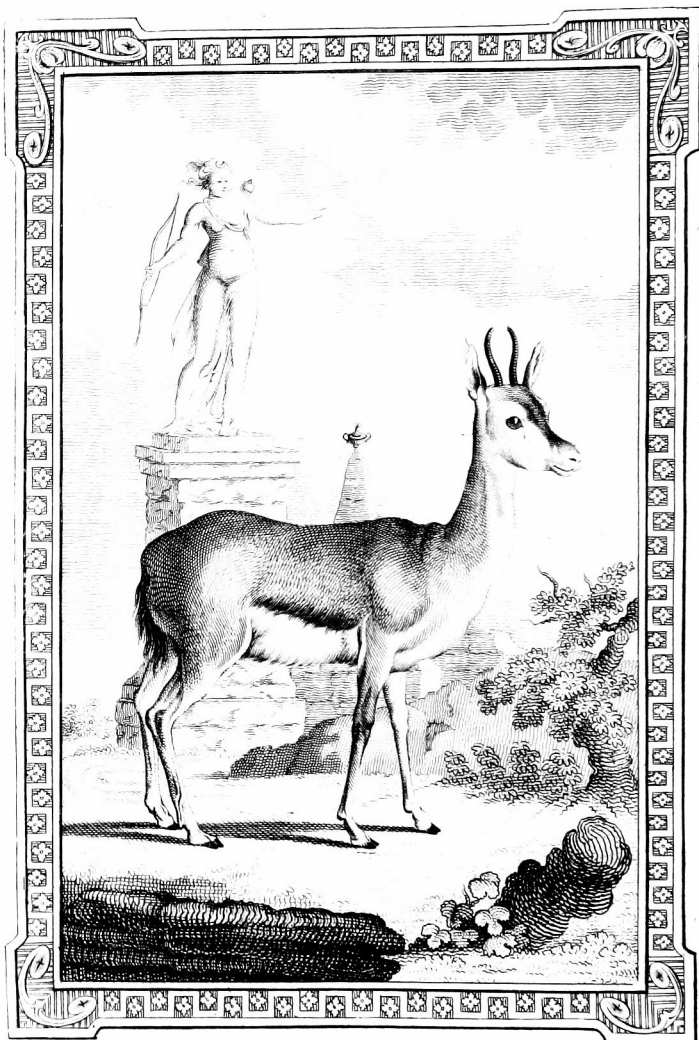
* See note at p. 439.

† We found an *aegagropilus* in a porcupine sent us from Rome in the year 1763.



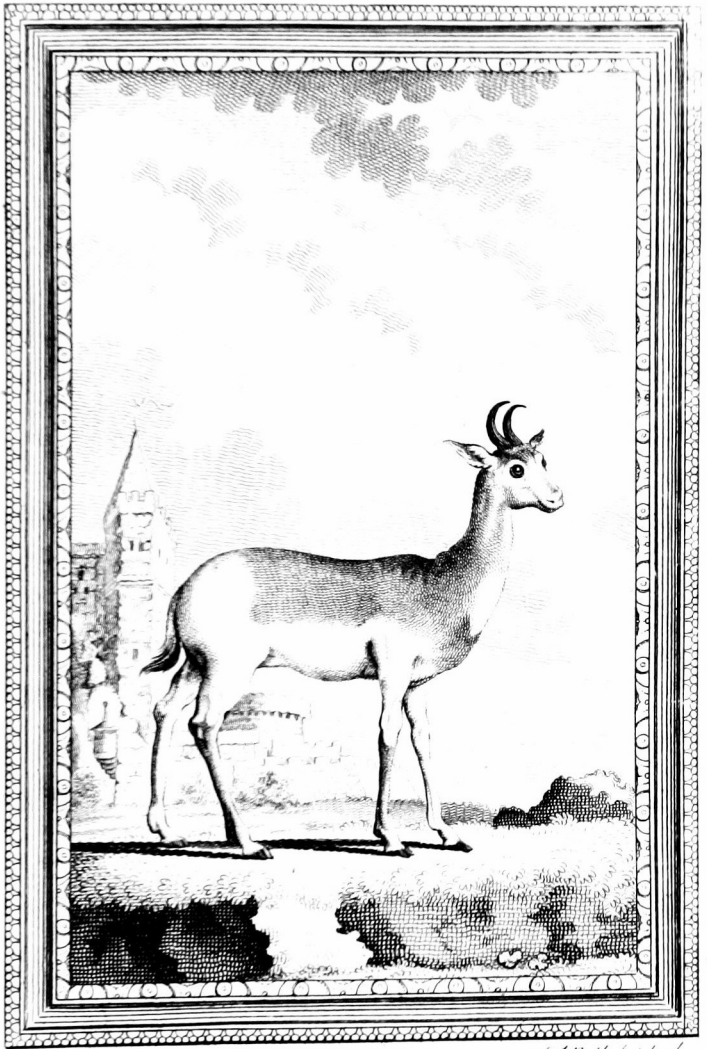
A. Bell Sculp.

GAZELLE.



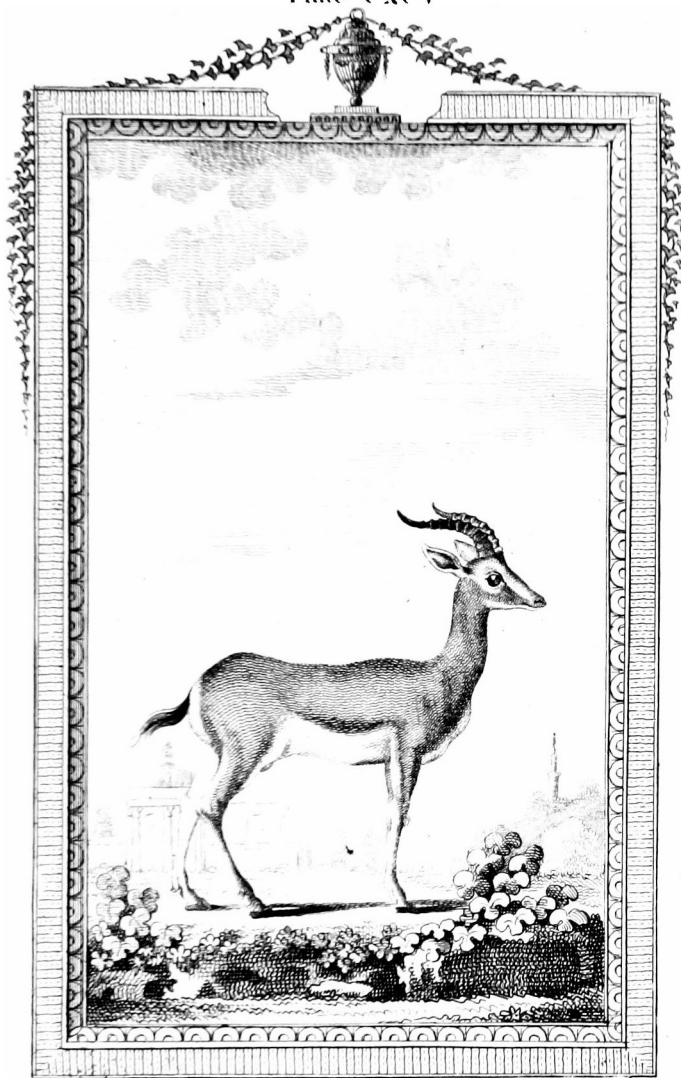
A. Bell sculpt.

CORINE.



A. Bell's Sculp.

NANGUER



E. Bell sculpt.

KEVEL.

exalted than in any other region of the world, the bezoars, which are the residue of them, are also superior in quality to all others ; that, in America, where the heat is less intense, and the mountain herbs have not so much strength, the bezoars which proceed from them are also greatly inferior ; and, lastly, that, in Europe, where the herbs are feeble, and in the plains of both continents, where they are gross, no bezoars are produced, but only *aegagropili*, which contain nothing but hairs, roots, or filaments that are too hard to be digested.

END of VOLUME SIXTH,