

## NATURAL HISTORY.

### OF MULES.

[From the supplementary Volume.]

WE shall retain the name of *mule* to the animal produced by the jack-ass and mare; and to that procreated between the horse and she-ass, we shall give the denomination of *bardeau*. The differences which subsist between these two mongrel animals have never hitherto been marked by any author. These differences, however, afford the most certain criterion for distinguishing the relative influence of males and females in the product of generation. A comparison of these two mules, and other mongrels proceeding from a mixture of different species, will give us more precise ideas concerning this relative influence, than could be obtained by simply comparing two individuals of the same species.

The bardeau is much smaller than the mule, and seems to preserve the dimensions of its mother, the she-*as*; and the mule retains the dimensions of the mare. Hence, in mixed species, the size of the body appears to depend more upon the mother than the father. Now, these two animals differ in figure. The neck of the bardeau is thinner, the back sharper, and the crupper more pointed; while the fore-head of the mule is better shaped, the neck more beautiful, the sides rounder, and the crupper more plump. Hence both of these animals retain more of the mother than of the father, not only in magnitude, but in figure of body. This remark, however, does not apply to the head, limbs, and tail. The head of the bardeau is longer, and not so thick in proportion as that of the *as*; and the head of the mule is shorter and thicker than that of the horse. Hence, in the figure and dimensions of the head, they have a greater resemblance to the father than to the mother. The tail of the bardeau is garnished with hair nearly in the same manner as that of the horse; and the tail of the mule is almost naked, like that of the *as*. In this extreme part of the body, therefore, the similarity to the father predominates. The ears of the mule are longer than those of the horse; and the ears of the bardeau are shorter than those of the *as*. The limbs of the mule are hard and limber, like those of the horse; and the limbs of the bardeau are  
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more fleshy. Hence these two animals, in the form of the head, limbs, and other extremities of the body, have a greater resemblance to the father than to the mother.

In the years 1751 and 1752, I made two he-goats copulate with several ewes, and I obtained nine mules, seven males and two females. Struck with this difference between the number of males and females, I endeavoured to discover whether the number of male mules, produced by the *as* and mare, predominated in the same proportion. The information I received did not ascertain this point; but I learned that the number of male mules always exceeded that of the females. The Marquis de Spontin-Beaufort made a dog intermix with a she-wolf, and procured four mules, three of which were males\*. In fine, having made inquiries concerning mules which were more easily obtained, I learned, that the number of males greatly exceeded that of the females. In the article, *Canary-birds* †, I remarked, that of nine young produced between a goldfinch and a Canary-bird, there were only three females. These are the only certain facts I could collect on this subject ‡, which merits  
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\* Letter from the Marquis de Spontin-Beaufort to M. de Buffon, dated Namur, July 14, 1773, and attested by two letters from M. Serrey de Boilly, dated Namur, June 9, and July 19, 1773.

† See tom. iv. de l'Hist. Nat. des Oiseaux.

‡ What is related by different authors, concerning the ju-  
muls,

more attention than it has yet received ; for the mysteries of generation by the concourse of different species, and the ascertaining of the proportional effective powers of males and females in every kind of reproduction, can alone be developed by an assemblage of similar facts.

Of my nine mules produced by the he-goat and the ewes, the first was brought forth on the 15th day of April. When examined three days

more, appears to be very suspicious. The *Sieur Léger*, in his History of the Voudois, tells us, 'That, in the valleys of Piedmont, there are mongrel animals, called *jumars*; that, when engendered by a bull and a mare, they are denominated *hes* or *bes*, and, when produced by a bull and she-ass, they receive the appellation of *bis*; that these *jumars* have no horns, and are of the size of mules; that they are very swift; that he mounted one of them on the 30th day of September, and performed, in a single day, a journey of eighteen leagues, or fifty-four Italian miles; and that they were furer and more easy than a horse.'

From an ascription of this kind, we would be led to believe, that these *jumars*, produced by the bull and the mare and the-ass, either exist, or did formerly exist; yet I have never been able to discover any confirmation of these facts.

*Dr Shaw*, in his History of Algiers, p. 166, says, 'To the mule we may join the *kwarak*, as the Algerines call a little servicable beast of burden, begot betwixt an ass and a cow. That which I saw at Algiers (where it was not looked upon as a rarity), was single hoefed, like the ass, but distinguished from it, as having a sleeker skin, with the tail and the head (though without horns) in fashion of the dam's.' *Dr Shaw* is an author who deserves credit. However, having consulted several persons who had been in Barbary, and particularly the Chevalier James Bruce, they all assured me, that they had no knowledge concerning these animals engendered by an ass and a cow.

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after birth, and compared with lambs of the same age, it differed from them in the following particulars: The ears, upper part of the head, as well as the distance between the eyes, were larger. It had besides a band of whitish gray hair from the nap of the neck to the extremity of the tail. The four legs, the superior part of the neck, the breast, and belly, were covered with the same white, coarse hair. There was a small quantity of wool upon the flanks only; and even this short, curled wool, was mixed with a great deal of hair. The legs of this mule were also an inch and a half longer than those of a lamb of the same age. When examined eighteen days after birth, the white hairs were partly fallen off, and replaced by brown hairs, similar in colour to those in the he-goat, and nearly as coarse. The limbs continued to be more than an inch and a half longer than those of the lamb; and, on account of this length of limbs, it did not walk so well as the lamb. This lamb was killed by an accident; and I took no farther notice of the mule till four months afterward, when I compared it with a sheep of the same age. In the mule, from the space between the eyes to the extremity of the muzzle, the distance was at least an inch shorter than in the sheep; and the head of the mule was more than half an inch broader, at the broadest part. Hence the head of this mule was thicker and shorter than that of a sheep of equal age. The curva-

ture of the upper jaw, taken from the corner of the mouth, was near half an inch longer in the mule than in the sheep. The head of the mule was not covered with wool, but with long, bushy hair. The tail was two inches shorter than that of the sheep.

In the beginning of the year 1752, I obtained, from the union of a he-goat with ewes, eight other mules, six of which were males, and two females. Two of them died before I could examine them; but they seemed to resemble those who survived. Two of them, a male and a female, had four teats, two on each side, like those of the goats. In general, these mules had long hair on the belly, and particularly about the penis, as in the he-goat, and also on the feet, and particularly those behind. Most of them had the chanfrin less arched than is common to lambs, the distance between the hoofs larger, and the tail shorter.

Under the article *Dog*, I related some experiments made with a view to procure an intermixture between a dog and a wolf, where all the precautions employed for that purpose were abortive\*. The conclusion drawn from these experiments was in the following words: 'I pretend not absolutely to affirm, that the wolf, in no age or country, never intermixed with dogs. The contrary is asserted positively by the ancients. Aristotle remarks, that, though

\* See vol. IV. p. 24.

' animals

' animals of different species seldom intermix, yet it certainly happens among dogs, foxes, and wolves.' I have since learned the propriety of being thus cautious in my conclusions; for M. le Marquis de Spontin-Beaufort has succeeded in the junction of a dog and a wolf. I was informed of this fact by M. Surirey de Boissy, in a letter which he wrote me in the following terms:

' *Namur, June 9, 1773.* The Marquis de Spontin has in this place reared a very young she-wolf, to whom he gave, as a companion, a dog of nearly the same age. They were left at full liberty, and came into the apartments, the kitchen, the stable, &c. They live in the most intimate friendship, and are extremely caressing, lying under the table, and upon the feet of the persons who sit around.

' The dog is a kind of mongrel mastiff, and full of vigour. During the first six months, the wolf was fed with milk, and afterward with raw flesh, which it preferred to what was roasted. When she eat, no person durst approach her. At other times, she permitted every freedom, except abuse. She caressed all the dogs which came near her, till she began to give a preference to her old companion; after which, she was enraged at every other. She was covered, for the first time, on the 25th day of March last. Her amours continued fifteen days, with pretty frequent repetitions;

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‘and she brought forth her young on the sixth  
 ‘day of June at eight o’clock in the morning.  
 ‘Hence the time of her gestation was seventy-  
 ‘three days. The young were four in number,  
 ‘and of a blackish colour. Some of them have  
 ‘the half of the breast, and the pats, white.  
 ‘These colours are derived from the dog, which  
 ‘is black and white. From the moment of lit-  
 ‘tering, she growled and attacked all who ap-  
 ‘proached her. She no longer distinguished her  
 ‘masters; and would even have devoured the  
 ‘dog, if he had come near her.

‘I add, that she has been chained ever since  
 ‘she made a break at her gallant, who had leap-  
 ‘ed a neighbouring wall, in order to come at a  
 ‘bitch in season; that she nearly worried her  
 ‘rival; and that the coachman separated them  
 ‘by repeated blows of a large bludgeon, and  
 ‘conducted her to her lodge, where, imprudent-  
 ‘ly commencing his chastisement, her fury rose  
 ‘to such a degree, that she bit him twice in the  
 ‘thigh, and the wounds confined him six weeks  
 ‘to his bed.

In my answer to this letter, I thanked M. de  
 Boissy, and added some remarks with a view to  
 remove my doubts. M. le Marquis de Spontin  
 having seen my answer, obligingly wrote me in  
 the following terms:

‘*Namur, July 14, 1773.* I read with much  
 ‘satisfaction the judicious remarks you trans-  
 ‘mitted to M. Surirey de Boissy, whom I had  
 ‘begged

‘begged to communicate to you, during my  
 ‘absence, a fact, which cannot be denied, not-  
 ‘withstanding the force of your arguments, and  
 ‘the opinion I have always entertained, as well  
 ‘as the rest of the world, of the excellence of  
 ‘the many learned productions by which you  
 ‘have enlightened the republic of letters. But,  
 ‘whether it was an effect of chance, or one  
 ‘of those sports of Nature, who, as you re-  
 ‘mark, sometimes departs from her established  
 ‘laws, the fact is incontestible; and you will  
 ‘be convinced of its truth, if you give credit  
 ‘to what I have the honour of writing you,  
 ‘which can be attested by two hundred persons  
 ‘at least, who were witnesses to it as well as  
 ‘myself. This she-wolf was only three days  
 ‘old when I purchased it from a peasant, who  
 ‘had carried it off, after killing the mother. I  
 ‘fed it with milk till it was able to eat flesh.  
 ‘I recommended to those who had the care of  
 ‘it, to caress, and handle it often, with a view  
 ‘to render it as tame as possible. At last, it be-  
 ‘came so familiar that I have taken it to hunt  
 ‘in the woods at the distance of a league from  
 ‘my house, without any danger of losing it.  
 ‘Sometimes, when I was unable to call it back,  
 ‘it returned of its own accord in the night. I  
 ‘was always more certain of keeping it at home  
 ‘when I had a dog; for it was fond of dogs;  
 ‘and those who had overcome their natural re-  
 ‘pugnance, sported with it, as if they had been  
 ‘animals

\* animals of the same species. During all this  
 \* time, it attacked only cats and poultry, whom  
 \* it strangled, without discovering any inclination  
 \* to eat them. As soon as she attained the  
 \* age of twelve months, her ferocity increased,  
 \* and I began to perceive that she had a strong  
 \* desire to attack sheep and bitches. I then  
 \* chained her; because she frequently sprung  
 \* upon her master, when he attempted to restrain  
 \* her. She was at least one year old when I introduced  
 \* her to the acquaintance of the dog  
 \* which covered her. She has been kept in my  
 \* garden, which is situated in the centre of the  
 \* town, since the end of November last; and,  
 \* therefore, no male wolf can be supposed to have  
 \* had any communication with her. As soon  
 \* as she came in season, she discovered such an  
 \* affection for the dog, and the dog for her,  
 \* that each of them howled frightfully when  
 \* they were not together. She was first covered  
 \* on the 28th day of March, and twice each  
 \* day during the two following weeks. They  
 \* continued attached to each other more than a  
 \* quarter of an hour at every embrace, during  
 \* which time the wolf complained, and seemed to  
 \* suffer pain; but the dog was perfectly at his  
 \* ease. Three weeks after, her pregnancy was  
 \* perceptible. On the sixth day of June, she  
 \* brought forth four young, whom she still  
 \* suckles, though they are five weeks old, and  
 \* have pretty long sharp teeth. They have a  
 \* perfect

\* perfect resemblance to puppies, having long  
 \* pendulous ears. One of them is black, with  
 \* a white breast, which was the colour of the  
 \* dog. The others will probably be of the colour  
 \* of the mother. The hair of each of them is  
 \* coarser than that of ordinary dogs. There is but  
 \* one female, with a very short tail, like the dog,  
 \* who had scarcely any tail. They promise to  
 \* be large, strong, and very ferocious. The mother  
 \* is extremely solicitous concerning their  
 \* welfare. I doubt whether I shall keep her any  
 \* longer, having been chagrined by an accident  
 \* that befell my coachman, whom she bit so  
 \* cruelly, that he has been confined to his bed  
 \* these six weeks past. But I will engage, that,  
 \* if preserved, she will again have puppies by  
 \* the same dog, who is white, with large black  
 \* spots on the back. I hope, Sir, that what I  
 \* have said will answer for a reply to your remarks,  
 \* and that you will no longer hesitate  
 \* concerning the truth of this singular event.

My doubts are entirely removed, and I am  
 happy to embrace this opportunity of expressing  
 my thanks. The establishment of a rare fact in  
 natural history is a great acquisition. The means  
 of obtaining such facts are always difficult, and  
 often, as we have seen, very dangerous. It was  
 for this last reason that I sequestered my wolf  
 and dog from all society. I had formerly reared  
 a young wolf, who, till the age of twelve  
 months, did no mischief, and followed his  
 master

master like a dog. But, in the second year, he committed so many excesses that it was necessary to kill him. I learned by experience, that these animals, though softened by education, resume, with age, their natural ferocity. Willing to prevent these inconveniences, I kept my she-wolf always confined along with the dog; and I acknowledge that this method of procuring an union between them was ill imagined; for, in this state of slavery and disgust, the dispositions of the wolf, instead of being softened, were soured to such a degree, that she was more ferocious than if she had been at full liberty; and the dog, having been early detached from his equals, and from the society of men, had assumed a savage and cruel character, which the bad humour of the wolf served only to augment; so that, during the two last years, their antipathy arose to such a degree, that they desired nothing so much as to devour each other. In the experiment made by the Marquis de Spontin, every circumstance was reversed. The dog was in his ordinary condition: He had all the mildness and other qualities which this docile animal acquires by his intercourse with man. The wolf was likewise reared in perfect freedom and familiarity along with the dog, which, by being under no restraint, had lost his repugnance to her; and she, by the same mild management, became susceptible of attachment to him. She, therefore, received him with cordiality, when-

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ever the hour of Nature struck: And, though she seemed to complain and to suffer, she felt more pleasure than pain; for she allowed the operation to be repeated every day, during all the time she was in season. Besides, the proper moment for this unnatural union was seized. The wolf felt the impression of love for the first time. She was only in the second year of her age; and, of course, had not entirely resumed her natural ferocity.

All these circumstances, and perhaps some others which were not observed, contributed to the success of this fertile embrace. From what has been remarked, it would appear, that the most certain method of rendering animals unfaithful to their species, is to place them, like man, in society, and to accustom them gradually to individuals which, without such precautions, would not only be indifferent, but hostile to each other. However this matter stands, the Marquis de Spontin has ascertained the fact, that the dog can produce with the wolf even in our climates. I could have wished that the success of this experiment had induced its author to try the union of a wolf with a bitch, and of foxes with dogs. But if this desire should be considered as exorbitant, he must ascribe it to the insatiable enthusiasm of a naturalist\*.

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\* A similar fact has been announced by M. Bourgelat, in a letter to me, dated April 15, 1775: 'My Lord Pembroke,' says

But to return to our mules. In those I obtained from the he-goat and ewe, the number of males was as seven to two; in those from the dog and she-wolf, the males were as three to one; and, in those from the goldfinch and Canary bird, the males were as sixteen to three. It appears, therefore, to be certain, that the number of males, which is always greater than that of females in pure species, is still greater in mixed species. Hence, the male, in general, has a greater influence on the produce of generation than the female, because he transmits his sex to the greatest number, and because the number of males augments in proportion to the remoteness of the species which intermingle. The same thing must happen in the conjunction of different races: By crossing the remotest of these, we shall not only procure the most beautiful productions, but the greatest number of males.

says he, 'informed me, that, within these few days, he saw a large mastiff copulate with a she-wolf; that the wolf is tame; that she is always in her master's chamber, and consequently under his eye; that she never goes out alone; and that she follows her master with all the fidelity of a dog. He adds, that an animal merchant has had, at four different times, mules produced by the wolf and dog. He alleges, that the wolf is only a wild dog; and in this opinion he is joined by the celebrated anatomist Mr. Hunter. He thinks differently with regard to the fox. He tells me, that a bitch, who was a daughter of a wolf, and belonged to Lord Clanbrazil, intermixed with a setting dog, and produced puppies, which, according to his hunter, will be excellent pointers.'

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I have often endeavoured to investigate the reason why any religion, or any government, should prohibit the marriage of brothers and sisters. Did men learn, by very ancient experience, that the union of brother and sister was less fertile than an intermixture with strangers, or that the former produced fewer males, and feebler and more unhandsome children? It is certain, however, that, from a thousand experiments, both in men and the other animals, crossing the breed is the only mode of ennobling and preserving the perfection of the species.

To these facts and experiments, let us add what the ancients have said upon this subject. Aristotle tells us, that the male engenders with the mare, and that the junction produces an animal which the Greeks called *binnus* or *ginnus*. He likewise remarks, that the she-mule easily conceives, but seldom brings the foetus to perfection \*. Of these two facts, the second is more rare than the first; and both happen only in warm climates. M. de Bory, of the Royal Academy of Sciences, and formerly governor of the American islands, communicated to me a recent fact of this kind, in a letter, dated May 7, 1770, of which the following is an extract:

'You will perhaps recollect, Sir, that M. d'Alembert read, last year, in the Academy of Sciences, a letter, which informed him, that a she-mule, in the island of St. Domingo,

\* Arist. Hist. Animal. lib. vi. cap. xxiv.

'had brought forth a foal. I was desired to write for proper vouchers of the fact; and I have now the honour of sending you the certificate which I received. . . . My correspondent is worthy of the highest credit. He adds, that he has seen mules cover, indiscriminately, she-mules and mares, and likewise she-mules covered by stallions and he-mules.'

This certificate is judicially attested, and signed by witnesses of unquestionable veracity. The substance of it is, that on the 14th day of May, 1769, M. de Nort, Knight of St. Louis, and late Major of the Royal Legion of St. Domingo, had a she-mule brought to him, which was said to be sick; that her belly was remarkably large, and a membrane protruded through the vagina. M. de Nort, believing the animal to be inflated, sent for a Negro farrier, who had been accustomed to take care of diseased animals; that this Negro, who arrived in the absence of M. de Nort, had thrown down the mule, in order to give her a draught; that, the moment after the fall, she brought forth a young mule, perfectly formed, and covered with long and very black hair; that the young mule lived an hour; but that, having been both hurt by the fall, the foal died soon after birth, and the mother ten hours after; and, in fine, that the young mule was skinned, and the skin sent, says M. de Nort, to Doctor Matty, who deposited it in the Museum of the Royal Society at London.

Other

Other eye-witnesses, and particularly M. Cazanvart, surgeon, add, that the young mule seemed to have been mature, and well formed; that, from the appearance of its hair, head, and ears, it had a greater resemblance to the ass than common mules; that the paps of the mother were swelled, and full of milk; that, when the ignorant Negro perceived the feet issuing from the vagina, he drew so forcibly as to invert the uterus, and lacerate the parts, which occasioned the death of both mother and foal.

These facts, which appear to be well ascertained, show, that, in warm climates, the mule is not only capable of conception, but of bringing the foetus to full maturity. From my correspondents in Spain and Italy, I learn, that similar events have happened in these countries: But the facts are not so completely authenticated. It still remains to be inquired, whether this St. Domingo mule was impregnated by an ass or a mule. The superior resemblance of the young mule to the former seems to indicate, that she had been covered by an ass. The ferocious ardour of the ass renders him very indifferent in the choice of females, and makes him attack, with nearly the same avidity, the she-ass, the mare, and the mule.

We may, therefore, consider it as an established fact, that the he-mule can generate, and the she-mule produce. Like other animals, they have a feminal liquor, and all the organs neces-

fary to generation. But mongrel animals are always less fertile, and more tardy than those of a pure species. Besides, mules have never produced in cold climates, seldom in warm regions, and still more seldom in temperate countries\*. Hence their barrenness, without being absolute, may

\* To the above facts, the translator has to add an instance of the prolific powers of a she-mule in the North of Scotland. Having heard that a mule, belonging to Mr. David Tullo, farmer in Auchtertyre, in the county of Forfar, had some years ago brought forth a foal, he transmitted a few queries to be put to Mr. Tullo; and requested that his answers might be legally attested before a magistrate. This request was cheerfully complied with; and the following is an exact copy of the queries, answers, and attestations:

Interrogatories to be put to Mr. Tullo, tenant in Auchtertyre, parish of Newtyle, and county of Forfar, with his Answers thereto:

1<sup>st</sup>, Had you ever a she-mule? At what period? Is it true that the mule had a foal? At what time was she covered; and when did she foal?

Answered by Mr. Tullo: That he bought a she-mule about twenty years ago: That she was constantly in season for a horse: That about seven years thereafter, he gave her a horse; and that she, thereafter, gave him a foal, about the 10th of June. The mule's price was four pounds five shillings sterling.

2<sup>d</sup>, What was the colour of the foal? Was there any thing particular in its figure?

Answer: The foal was exactly the colour of its mother, inclined to black, with a very large head, big ears, and small tail; and the declarant thinks, had its head been weighed when foaled, it would have weighed nearly as much as its body.

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may be regarded as positive; since their productions are so rare, that a few examples only can be

3<sup>rd</sup>, How long was the animal allowed to live?

Answer: The next day after the mule foaled, it was sent, with its mother, to the Loch of Lundie, in order to let the foal die, as the declarant could not want the mule's work, and the mother seemed not fond of the foal: That it was accordingly left, and next day came to Auchtertyre, about two miles distance, over a hill, with the cattle of Auchtertyre, that had been grazing near to that place, and was drowned in a ditch the day following.

4<sup>th</sup>, Was its skin preserved, or the head, or any other bones of the skeleton? Could any part thereof be still found?

Answered: Neither the skin, nor any part of the skeleton was preserved, nor can now be had; though the declarant has often regretted the not preserving the foal, as its mother always performed any work that a horse of fifteen pounds value could do.

5<sup>th</sup>, Is the mother still alive? What is her age?

Answer: The mother died, about eight years ago, of an epidemic cold that was raging among the horses in this country: The mule had little or no milk after foaling, and the foal got some cow's milk: And this is all that he remembers of the matter.

DAVID TULLO.

*Auchtertyre, 4<sup>th</sup> Feb. 1780.*

We James Small, tenant in Barmouth, and Robert Ramsay, tenant in Newtyle, hereby certify, That we have often seen the mule above described, and we know that she had a foal, as is narrated by David Tullo.

JAMES SMALL.  
ROB. RAMSAY.

*Ballantyne-House, 4<sup>th</sup> Feb. 1780.*

The within interrogatories were put to David Tullo, tenant in Auchtertyre, ament the mule he had, and the foal she produced,

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be collected. But men were wrong in asserting that mules were absolutely barren, and that all animals proceeding from a mixture of different species were, like the mules, incapable of producing. The facts formerly related concerning the produce of a he-goat and a ewe, of a dog and a she-wolf, and of Canary-birds and gold-finches, demonstrate, that these mongrels are by no means barren, and that some of them are equally prolific with their parents.

It is an unhappy circumstance, that a small, and often nominal error, extends over every object to which it has any relation, and at last not only becomes an error in fact, but gives rise to a general prejudice, that is more difficult to remove than the particular opinion from which it originated. A single word, a name like that of *mule*, which ought solely to represent the idea of the animal proceeding from the ass, and mare, has been improperly applied to the animal produced by the horse and the she-ass, and afterward, with still greater impropriety, to all quadrupeds, and all birds, of mixed species: And,

daced, to which he gave the answers subjoined to each query, and signed them, as did James Small and Robert Ramsay, attesting the truth thereof, in presence of

GEORGE WATSON, J. P.

The original attestation is in the possession of the Translator; and he lately transmitted notorial or authenticated copies of it to the Count de Buffon, and to Thomas Pennant, Esq. of Downing, in Flintshire.

as this word *mule*, in its original acceptation, included the idea of the barrenness common to the animal proceeding from the ass and mare, this idea of barrenness has been conveyed to all beings who have the denomination of *mules*; I say to all beings; for, independent of quadrupeds, birds, and fishes, mule plants have been fancied, to which, without hesitation, this general sterility has also been ascribed. None of these beings, however, is absolutely barren. The *mule*, properly so called, or the animal produced by the ass and mare, is not absolutely barren; but its prolific powers, when compared with those of pure species, or even with those of other animals of a mixed species, are much more feeble and uncertain.

All mules, says Prejudice, are vitiated animals, incapable of producing: No animal, say Reason and Experience, though proceeding from two species, is absolutely barren. It ought to be remarked, however, that in pure, as well as in mixed species, the degrees of fertility are very different. In the first, some, like the fishes and insects, multiply, annually, by millions; others, as the birds and small quadrupeds, produce by twentys and dozens; in fine, others, as man, and the larger quadrupeds, produce only one in twelve months. The number produced may be said to be in the inverse proportion of the magnitude of animals. The horse and ass bring forth but one in a year; and, in the same pe-

riod, the mouse and Guiney-pig produce thirty or forty. Hence the fecundity of these small animals is thirty or forty times greater; and, if a scale were formed of the different degrees of fertility, the small animals above enumerated would occupy the highest points, while the horse and ass would be found nearly in the lowest; for the elephant alone is less fertile.

In mixt species, there are also different degrees of fecundity; for animals proceeding from two species partake of two natures, and are, in general, less fertile; and this want of fertility increases in proportion to the fecundity of the parents. Hence, if the horse and ass, two animals naturally not very fertile, mix, the original infecundity, instead of diminishing in the mongrel race, must be augmented. The mule will not only be less fertile than its parents, but, perhaps, the most infertile of all mongrels, because all the other mules which produce, such as those proceeding from the he-goat and ewe, from the goldfinch and Canary-bird, &c. are much more fruitful than those produced by the ass and horse. It is to this original and particular cause, that the infecundity of the mule and bardeau should be referred. A second cause, still more particular, renders the last animal less prolific than the first. The mule proceeding from the ass and mare retains the ardent temperament of the father, and, of course, possesses a high degree of prolific power; while the bardeau proceeding

ceeding from the horse and ass is, like its father, less potent, and less able to engender. Besides, the mare, being less ardent than the she-ass, is likewise more fertile, since she conceives and retains with more certainty. Thus every circumstance concurs in rendering the mule more prolific than the bardeau; for ardour of temperament in the male, which is so necessary to successful generation and the number produced, is hurtful in the female, and almost always prevents conception and retention.

This fact holds generally both in man and the other animals. Cold women, joined to ardent men, produce a number of children. A woman, on the contrary, who feels too acutely the emotions of love, is seldom fertile. But, in most women who are merely passive, the effect is more certain; because the fruit of generation is less disturbed by the convulsions of pleasure. These are so marked, and so destructive to the conception, in some females, such as the she-ass, that she requires cold water to be thrown on her crupper, and even heavy blows, in order to repress them. Without such disagreeable aids, the she-ass would seldom be impregnated, till age abated the fury of her passion. The same means are sometimes employed to make mares conceive.

But, it may be said, that female dogs and cats, which seem to be more ardent than the mare and she-ass, never fail to conceive; and, there-

fore, that the fact advanced concerning the infecundity of females whose feelings are exquisite, is too general, and admits of many exceptions. But the example of dogs and cats, instead of being an exception, is rather a confirmation of the general rule; for, in the bitch, however violent the convulsions of the internal organs may be supposed, they have full time to be appeased during the long interval between consummation and the retreat of the male, who cannot detach himself till the turgidity and irritation of the parts subside. The female cat is in a similar situation. Of all females, she appears to be most ardent in her amours; for she calls to the males with lamentable cries, which announce the most pressing necessity. But, as in the dog, from a particular conformation of the male cat, this violent female never misses conception. Her desires, which are excessive, are necessarily tempered with a pain almost equally acute. The glans of the male cat is covered with large sharp prickles. The intromission of it, therefore, must be extremely painful to the female, who announces her sufferings by loud cries. The pain is so great, that she instantly makes every effort to escape, and the male, to retain her, is obliged to seize her by the neck with his teeth, and to compel submission from the very female who had invited his embraces.

In

In domestic animals, who are well fed and taken care of, multiplication is greater than in those who continue in a wild state. Of this we have an example in domestic dogs and cats, who produce several times every year; but, when in a natural state, they produce only once in the same period. Domestic birds furnish an example still more striking: Can the fecundity of any species of wild birds be compared to that of a well fed hen, when properly served with a cock? And, even in the human species, what a vast difference between the scanty propagation of savages, and the immense population of civilized nations, under the administration of a wise government? But we here confine ourselves to the fecundity natural to animals in full possession of liberty, the relative fertility of whom is exhibited in the following Table, from which some important conclusions may be drawn.

# TABLE

# TABLE of the Relative Fecundity of ANIMALS.

Name.	Age at which males can engender, and females procreate.		Time of gestation.		Number of young produced at a litter.		Age at which males cease to engender, and females to procreate.	
	M A L E. Years.	F E M A L E. Years.	2 years	3 years	1 in 3 or 4 years	M A L E. Years.	F E M A L E. Years.	
Elephant	30	30	15 or 20	15 or 20	1	lives 70 or 80	at 18 or 20	
Rhinoceros	15	15	15 or 20	15 or 20	1	lives 40 or 50	at 18 or 20	
Hippopotamus	15	15	15 or 20	15 or 20	1	lives 40 or 50	at 18 or 20	
Walrus	15	15	15 or 20	15 or 20	1	lives 40 or 50	at 18 or 20	
Camel	4	4	1 year nearly	1 year nearly	1	lives 25 or 30	at 25 or 30	
Dromedary	4	4	11 months	11 months	1, sometimes 2	lives 15 or 18	at 9	
Horse	2	2	11 ditto	11 ditto	1, rarely 2	lives 15 or 18	at 9	
Zebra	2	2	11 do. & more	11 do. & more	1, rarely 2	lives 15 or 18	at 9	
Ass	2	2	9 months	9 months	1, rarely 2	lives 15 or 18	at 9	
Os	2	2	8 do. & more	8 do. & more	1, rarely 2	lives 15 or 18	at 9	
Ox	2	2	8 months	8 months	1, rarely 2	lives 15 or 18	at 9	
Sheep	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	
Reindeer	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	
Lama	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	
Man	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	
Large apes	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	
Moultin	1	1	9 months	9 months	1, sometimes 2	lives 15 or 18	at 9	

Name.	Age at which males can engender, and females procreate.		Time of gestation.		Number of young produced at a litter.		Age at which males cease to engender, and females to procreate.	
	M A L E. Years.	F E M A L E. Years.	5 months	5 months	1, sometimes 2 1, 2, sometimes 3	M A L E. Years.	F E M A L E. Years.	
Stiga	1	1	5 months	5 months	1, sometimes 2	lives 15 or 20	at 15 or 20	
Roebeek	1	1	5 ditto	5 ditto	1, 2, sometimes 3	lives 12 or 15	at 15 or 20	
Chamois goat	1	1	5 ditto	5 ditto	1, 2, rarely 3	lives 20	at 15 or 20	
Goat	1	1	5 ditto	5 ditto	1, 2, rarely 3, and never above 4	lives 20	at 15 or 20	
Sheep	1	1	5 ditto	5 ditto	1, sometimes 2, twice a year, in warm climates 2 or 3	lives 20 or 25	at 15 or 20	
Seal	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Bear	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Badger	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Lion	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Leopards and Tiger	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Wolf	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	
Dog in a natural state	2	2	several months	several months	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	lives 20 or 25	at 15 or 20	

# NAMES,

	Age at which males can engender, and females produce.		Times of gestation.		Number of young produced at a litter.		Age at which males cease to engender, and females to produce.	
	M A L E. Years.	F E M A L E. Years.					M A L E. Years.	F E M A L E. Years.
Infants	1	1	65 days	in winter, and produces in April	6 and 7		at 10 or 11	at 10 or 11
Fox	1	1	In season		3, 4, to 6			
Jackal	1	1	56 days	in March, and produces in May	2, 3, or 4			
Canine in a manul	1	1	50 days	in March, and produces in May	4, 5, or 6			
Martin	1	1	50 days	in March, and produces in May	3, 4, and 5		at 9	at 8 or 10
Pine Weasel	1	1	idem		3, 4, and 6		at 8 or 10	at 8 or 10
Polecat	1	1	idem		3, 4, and 6		at 8 or 10	at 8 or 10
Weasel	1	1	idem		3, 4, and 6		at 8 or 10	at 8 or 10
Ermine	1	1	idem		3, 4, and 5		at 8 or 10	at 8 or 10
Squirrel	1	1	idem		3 or 4		idem	idem
Flying Squirrel	1	1	idem		3 or 4		idem	idem
Field Squirrel	1	1	idem		3, 4, and 5		lives 6	
Dormice	1	1	40 days		3, 4, and 5			
Musk Rats	1	1	idem		4, 5, or 6			
Opiflans	1	1	idem		4, 5, or 6			

# NAMES,

Name.	Age at which males can engender, and females produce.		Times of gestation.		Number of young produced at a litter.		Age at which males cease to engender, and females to produce.	
	M A L E. Years.	F E M A L E. Years.					M A L E. Years.	F E M A L E. Years.
Hogs	1 year or 9 mos.	1 year or 9 mos.	4 months		10, 12, 15, to 20, twice a year		at 15	at 15
Armadillos	1	1	idem		4 several times a year			
Hare	1	1	30 or 31 days		2, 3, 4 several times a year		lives 7 or 8	
Rabbit	1	1	idem		4, 5, to 8, several times a year		idem	
Ferret	1	1	40 days		5, 6, to 9, twice a year		during life	
Rats	1	1	idem		5 or 6 weeks		idem	
Field Mice	1	1	idem		1 month or 5 weeks		idem	
Mouse	1	1	idem		1 month or 5 weeks		idem	
Brown Rat	1	1	idem		1 month or 5 weeks		idem	
Guinea Pig	5 or 6 weeks	5 or 6 weeks	3 weeks		8 or 10 times a year		lives 6 or 7 years	lives 6 or 7 years

This is the order in which Nature has presented to us the different degrees of fecundity in quadrupeds; and from it we perceive, that this fecundity diminishes in proportion to the magnitude of the animal. In general, this scale of fecundity extends to all the other tribes of animated Nature. Small birds are more prolific than the larger kinds. The same thing holds in fishes, and perhaps in insects. But, confining our remarks to quadrupeds alone, it appears from the above table, that the hog is the only exception to the general rule; for, from the size of his body, he should be ranked with those animals which produce only two or three, once in twelve months, while, in fact, he is equally prolific with small quadrupeds.

This table contains all that is known with regard to the fertility of pure species. But the fecundity of mixed species, which is always less than that of the pure, merits particular attention. The reason will be apparent, by supposing, for example, that all the males in the horse species, and all the she-asses, or, rather, all the jack-asses and all the mares, were destroyed: In this case, those mixed animals alone, which we call *mules* and *bardeaux*, would be produced; and the number brought forth would be much fewer than that of horses or asses; because the natural conformities or relations between the horse and she-ass, or between the jack-ass and mare, are less than between the horse and mare, or the male

and female ass. It is the number of conformities and dissimilarities which constitutes or distinguishes species; and, since the species of the ass has at all times been separated from that of the horse, it is apparent, that, by mixing these two species, whether by means of females or males, we diminish the number of conformities which constitute the species. Hence the males will engender and the females produce seldomer, and with more difficulty; and even those mixed species, if their conformities were fewer, would become entirely barren. Mules of every kind, therefore, must be rare; because it is only by being deprived of its natural female, that any animal will intermix with a female of a different species. Even when mongrel animals approach each other with some degree of warmth, their produce is neither so certain nor so frequent as in pure species, where the number of conformities is greater. Now, the produce of mixed species will be less frequent, in proportion to the infecundity of the pure species from whom they proceed; and the produce of animals proceeding from mixed species will always diminish in proportion as they recede from the original stock; because the conformities between them and any other animal are augmented. For example, I am persuaded, from the reasons above assigned, that an intercourse between two *bardeaux* would be abortive. Besides, these animals proceed from two species which are not very fertile, and are

also under the influence of the same causes which often prevent the she-*as* from conceiving with her own male. I am more uncertain with regard to the sterility of *mules* properly so called; because they are not liable to the last cause of barrenness; for, as the mare conceives more easily than the she-*as*, and the jack-*as* is more ardent than the horse, their respective prolific powers are greater, and their produce not so rare as that of the she-*as* and horse. The mules, of course, will be less barren than the *bardeaux*. I suspect, however, that two mules never engender; and I presume, even from the examples of fertile mules, that they owe their impregnation to the *as*, rather than to the mule; for we ought not to regard the he-mule as the natural male of the she-mule, though they both have the same name, or, rather, differ only in sex.

To explain this matter, let us suppose an order of kindred in species, like that which takes place in families. The horse and mare will be brother and sister in species, and parents in the first degree. It is the same with the male and female *as*. But, if the male *as* is given to the mare, they are only cousins in species, or kindred in the second degree. The mule produced by them, participating one half of both species, will be removed to the third degree of kindred. Hence the male and female mule, though proceeding from the same father and mother, instead of being brother and sister in species, are  
only

only kindred in the fourth degree; and, of course, will produce more difficultly between themselves, than the jack-*as* and mare, who are kindred species in the second degree. For the same reason, the male and female mules will not produce so easily between themselves, as with the mare or *as*; because the kindred of the latter in species is only in the third degree, while that of the former is in the fourth degree. The infecundity, which appears in the second degree, should be more conspicuous in the third, and perhaps absolute in the fourth.

In general, kindred of species is one of those mysteries of Nature, which man can never unravel, without a long continued and difficult series of experiments. How can we otherwise learn, than by the union of different species of animals many thousand times repeated, the degree of their kindred? Is the *as* more allied to the horse than the zebra? Does the wolf approach nearer to the dog than the fox or jackal? At what distance from man shall we place the large apes, who resemble him so perfectly in conformation of body? Are all the species of animals the same now that they were originally? Has not their number augmented, instead of being diminished? Have not the feeble species been destroyed by the stronger, or by the tyranny of man, the number of whom has become a thousand times greater than that of any other large animal? What relation can be established

between kindred species, and another kindred still better known, that of different races in the same species? Does not a race, like the mixed species, proceed from an anomalous individual, which forms the original stock? In the dog species, there is, perhaps, a race so rare, that it is more difficult to procreate than the mixed species proceeding from the ass and mare. How many questions does this subject admit of; and how few of them are we in a condition to solve? How many facts must be discovered before we can even form probable conjectures? However, instead of being discouraged, the philosopher ought to applaud Nature, even when she is most mysterious, and to rejoice that, in proportion as he removes one part of her veil, she exhibits an immensity of other objects, all worthy of his researches. For, what we already know ought to point out what may still be known. There is no boundary to the human intellect. It extends in proportion as the universe is displayed. Hence man can and ought to attempt every thing: He wants nothing but time to enable him to obtain universal knowledge. By multiplying his observations, he might foresee all the phenomena and all the events of Nature with equal certainty, as if he deduced them from their immediate causes: And what enthusiasm can be more pardonable, or rather more noble, than to believe that man is capable, by his labours, to discover

discover all the powers and mysteries of Nature!

These labours consist chiefly in making observations and experiments, from which we discover new truths. For example, the union of animals of different species, by which alone we can learn their kindred, has never been sufficiently tried. The facts we have been able to collect concerning this union, whether voluntary or forced, are so few, that we are not in a condition to ascertain the existence of *jumars*. This name was first given to mules said to have proceeded from the bull and mare; but it has likewise been applied to denote mongrels alleged to have been procreated by the jack-ass and cow. Dr. Shaw tells us, that, in the provinces of Tunis and Algiers, 'there is a little serviceable 'beast of burden, called *kumrab*, begot betwixt 'an *ass* and a *cow*. That which I saw at Algiers (where it was not looked upon as a rarity) was single hoofed like the ass, but distinguished from it in having a sleeker skin, with 'the tail and the head (though without horns) 'in fashion of the dam's\*.'

Thus we have already two kinds of *jumars*, the one proceeding from the bull and mare, and the other from the jack-ass and cow. A third is mentioned by Merolle, and is pretended to proceed from the bull and she-ass. 'There 'was a beast of burden which proceeds from

\* Shaw's Travels, p. 165.

\* the bull and she-ass, and is obtained by covering the ass with a cow's skin, in order to deceive the bull\*.

But I am equally doubtful concerning the existence of all the three kinds of jumars; though I pretend not to deny the possibility of the fact. I have even enumerated some facts which prove an actual copulation between animals of very different species; but their embraces were ineffectual. Nothing seems to be more remote from the amiable character of the dog than the brutal manners and instinct of the hog; and the form of their bodies is as different as their natural dispositions. I have seen, however, two examples of a violent attachment between a dog and a sow. Even during this very summer 1774, a large spaniel discovered a violent passion for a sow which was in season: They were shut up together for several days; and all the domestics were witnesses of the mutual ardour of these two animals. The dog exerted many violent efforts to copulate with the sow; but the dissimilarity of their organs prevented their union †. The same thing happened some years before ‡. Hence animals, though of a very different species, may contract a strong affection to each other; for it is certain, that in the above examples, nothing prevented the union of the dog and sow but the

\* Voyage de Mercelle au Congo, en 1682.

† This fact happened in the house of M. le Comte de la Feuillée, in Burgundy.

‡ At Billy, near Chancœu in Burgundy.

conformation of their organs. It is not equally certain, however, that if consummation had taken place, production would have followed. It often happens, that animals of different species spontaneously unite. These voluntary unions ought to be prolific, since they imply that the natural repugnance, which is the chief obstacle, is surmounted, and also a conformity between the organs. No fertility, however, has resulted from such commixtures. Of this an example recently passed before my eyes. In 1767, and some succeeding years, the miller at my estate of Buffon kept a mare and a bull in the same stable, who contracted such a passion for each other, that as often as the mare came in season, the bull covered her three or four times every day. These embraces were repeated during several years, and gave the master of the animals great hopes of seeing their offspring. Nothing, however, resulted from them. All the inhabitants of the place were witnesses to this fact, which proves, that, in our climate at least, the bull cannot procreate with the mare, and renders this first kind of jumar extremely suspicious. I have not equal evidence to oppose to the second kind, which Dr. Shaw says proceeds from the jack-ass and cow. I acknowledge, that though the dissimilarities in structure appear to be nearly equal in both cases, the positive testimony of a traveller so well informed as Dr. Shaw, seems to give a greater degree of probability to the exist-

ence of this second kind of jumar than we have for the first. With regard to the third jumar, proceeding from the bull and she-ass, I am persuaded, notwithstanding the authority of Merolle, that it has no more existence than the one supposed to be produced by the bull and mare. The nature of the bull is still farther removed from that of the she-ass, than from that of the mare: And the unfertility of the mare and bull, which is ascertained by the above examples, should apply with greater force to the union of the bull and ass.

## The NOMENCLATURE of APES.

TO teach children, and to address men, are two very different offices. Children receive without examination, and even with avidity, the arbitrary and the real, the true and the false, whenever they are presented to them under the form of precepts. Men, on the contrary, reject with contempt all precepts which are not founded on solid principles. We shall, therefore, adopt none of those methodical distributions by which, under the appellation of *ape*, a multitude of animals, belonging to very different species, have been huddled together in one indiscriminate mass.

What I call an *ape* is an animal without a tail, whose face is flat, whose teeth, hands, fingers, and nails resemble those of man, and who, like him, walks erect on two feet. This definition, derived from the nature of the animal itself, and from its relations to man, excludes all animals who have tails; all those who have prominent faces or long muzzles; all those who have crooked or sharp claws; and all those who walk more willingly on four than on two legs. According to this precise idea, let us examine how many species of animals ought to be ranked under the denomination of *ape*. The ancients knew only