M. F. Cuvier's Essay on the Domestication of the Mammiferae.

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As the strangest prejudices have been formed regarding the state of animals in captivity, in the present essay, on the domestication of mammiferae, I shall commence with some considerations calculated to rectify these ideas, and to afford juster notions than appear to have been entertained regarding animals, and the various states in which we may study their habits.

It is maintained that animals can only be studied with advantage when they enjoy a perfect independence. It is indeed admitted that those which are domesticated may furnish some useful knowledge; that their study is calculated to direct us to the means of subjugating them, of rearing and improving them with relation to our wants; that it apprizes us of the services which we have received from them, and of those which they are still capable of rendering us; and that by thus studying them, we are even enabled to discover the design which Providence had in view in placing them upon the earth. But it is said, what could animals reduced to slavery teach us? Under the weight of the restraint in which we are obliged to hold them, we obtain from them actions which are only artificial, and consequently little calculated to unveil their nature. It

would be quite otherwise were they in a state of liberty. Then their nature would manifest itself, and the more so the less constraint they experienced from the circumstances in which they were placed; for as the most complete slavery is the situation the least favorable to the exercise of the faculties, the most entire independence, or the state of nature, is the best adapted for their exercise and devolopement.

The origin of these ideas is easily discovered. They proceed from the same source as most of the errors which have been entertained with respect to the nature of animals; the ideas to which the study of man gave rise were applied to these beings. But if slavery, if absolute submission to the will of another, is the situation the most repugnant to the moral and intellectual developement of the human species, one essential character of which consists in liberty, what reason would there be for animals, which are deprived of all liberty, properly so called, experiencing the same effects from slavery as ourselves? In establishing, as a principle, that these animals unveil their nature to us only in a state of absolute independence, and in yet admitting that they may act in a state of domestication, and even of slavery, was the same thing as saying that they have the faculty of not acting according to their nature; that they are susceptible of obeying desires which have not been imparted to them; that they manifest other dispositions than those which they have received; in a word, that they may be something else than what they ought to be in virtue of the laws of the universe, and that man may have the power of changing their nature, and of destroying the laws of creation.

Were liberty necessary in order to animals manifesting themselves to us such as they originally came from the hands of nature, it would be as impossible for the wild as for the domesticated or captive animals to do so, for the former no more enjoy that imaginary state of absolute independence which is called the state of nature, than the latter. All of them lie under the unavoidable influence of the circumstances in the midst of which they are placed. A wild animal, amidst the forests of a desert region, will not have any very close resemblance to what it would be in the midst of a very populous country. It will be still more widely different, if reduced to captivity, or converted into a domestic animal, and will lose altogether its original character. But whatever differences these various states may present, this animal will always be the same; it is only in its own nature that the means will be met with which are calculated to put it in harmony with this diversity of situations, and the facts which it presents to us in the one situation, if they are numerous and diversified, may

afford us the means of deducing its faculties as accurately as we should deduce them from facts presented by the others.

It is not the ordinary conditions of animal existence, those which first present themselves in all the circumstances where human industry does not interfere, that are the best calculated to make animals act in a manner favorable to the unfolding of their faculties. The equilibrium which is constantly tending to establish itself among all the powers which simultaneously act here below, gives to the most energetic a preponderance over the more feeble, which never leaves the latter the liberty of acting; and it is only by mastering these predominating powers, by attenuating them, that we come to discover the others, that we render them sensible, and vary their effects.

In their natural independence, that is to say, such as it may be in all the circumstances in which it naturally occurs, animals are under the yoke of these predominating powers: and they may then inform us of the place which they occupy among the other beings submitted to the same powers, of the relations in which they stand to them, and of the influence which they exercise in the general economy; but, in this state, they can only, in common, afford us very confined and always doubtful ideas, regarding their general faculties; for, in this case, it does not depend upon us to submit them to experiment, in order to confirm our conjectures. Buffon tells us what every body has repeated after him. "that to fierceness, courage, and strength, the lion joins nobility, clemency, and magnanimity; that he often forgets he is king, that is to say the strongest of all animals; that, walking with a tranquil pace, he never attacks man, unless when provoked; that he does not accelerate his steps, or run, or pursue, unless when pressed by hunger; that the tiger, on the other hand, while meanly ferocious, cruel without justice, that is to say, without necessity, seems always thirsty of blood, although satiated with flesh; that his fury has no other interval than that of the time necessary for preparing new ambushes; that he seizes and tears a new prey with the same rage which he has just exercised, but not assuaged, in devouring the first," &c.

Now these differences between the lion and the tiger can only be relative to the circumstances in which the individuals so described had lived, for these animals have nearly the same dispositions. Placed in the same circumstances, they have constantly presented the same phenomena to us: they have shown us that the one is as easily tamed as the other: that they become equally attached to their keepers, experience the same feelings for the benefits which they receive, and that their hatred or their rage is provoked by the same causes; that their

sports are similar, as well as the manifestations of their fears or desires; that they seize their prey with the same avidity, and defend it with the same fury; in a word, that their natural dispositions are absolutely the same. What has not been said of the hyena? Its very name has become the emblem of the most sanguinary cruelty; and, in imitation of Buffon, the most sagacious naturalists have adopted the prejudice which places this animal in the first rank of ferocity. The truth is, that the hyena, treated with kindness, comes to the feet of its master, like a dog, soliciting caresses and food; and we have several times seen it doing so. I might multiply examples of this kind to infinity, and hence prove, on the one hand, that, in a state of independence, animals exist under circumstances so concealed, that we can only very rarely appreciate the influence which they exercise over them; and, on the other, that captivity, by affording us the means of withdrawing animals from the powers which, in the contrary state, rule over or restrain them, in order to subject them to the other powers, permits us to make a more accurate and more complete examination of them.

It is undoubtedly because we have constantly been in the habit of observing wild animals in a state of liberty alone, and because we have confined ourselves to describing the actions which then accidentally presented themselves, that this important branch of natural history has hitherto only been enriched by isolated facts, which have often appeared to be without mutual accordance, because no bond united them, and because no principle directed the observer in his inquiries; for no principle could be deduced from these hypotheses, which originated in the desire of explaining the cause of the actions of brutes, in order to harmonise them with the idea which was formed of the cause of the actions of man. These hypotheses, not having any foundation in nature, could only mislead those who rested upon them.

For a long time it was admitted, that the moral perfection of man depended upon the perfection of his organs; and if this error at length yielded to evidence, it was yet cherished in full force with reference to animals. Those who had the most delicate senses, the most pliant limbs, and most favorable to motion, were necessarily the most intelligent; and the monkeys and carnivora seemed to confirm this rule. But the possession of several seals, that is to say mammifera whose limbs are converted into fins, which are destitute of external ears, whose eyes, formed for a liquid medium, can only see imperfectly in the air, whose nostrils open only when the animal inspires, and whose body, clothed with a thick layer of fat, has, so to speak,

no sense of touch excepting at the points where the moustaches are affixed, has demonstrated, by means of actions artificially provoked, that the extent of intellect is no more proportional to the perfection of the organs in animals than in man.

All the analogies founded upon the observations of animals in a state of liberty, made it in general be regarded as a certain fact, that the intelligence of each animal in its development followed the progression which we observe in the development of the human intellect.

The study of animals in a state of captivity has had the effect of destroying this prejudice; for it was only necessary to compare them with themselves at different periods of their life, and consequently to follow their development, in order to perceive that the young are incomparably more intelligent than those which have attained the age of maturity. But this observation is not confined to the establishment of a new and important fact; it has, moreover, thrown light upon a question of high interest. In observing that in their early youth the intellectual faculties with which animals have been endowed have acquired all the extent and activity of which they are capable, and that they begin to diminish as soon as the age of vigour arrives, we have acquired a new demonstration of the fundamental difference which distinguishes them from man.

It is not merely truths which may be deduced from contingent and fortuitous actions that we obtain from animals kept in a state of captivity; these animals also afford us information respecting those which result from their necessary actions.

So long as beavers had only been observed in their native liberty, it was seen that those which live collected into bands in wild countries construct habitations, and that the solitary individuals, such as are sometimes met with, especially in populous countries, made their retreat in the natural excavations of the banks of lakes and rivers; and it was concluded from these facts, "that these animals do not labour and build by a physical power or necessity, like ants and bees; that they do it by choice, and that their industry ceases whenever the presence of man has diffused its terror among them." If, however, Buffon had formed the idea of placing them in suitable circumstances, and of giving them the materials which they commonly employ in building, he would have seen that their solitude, and the presence of man, did not make them intermit their labours, that they still took care to build; several solitary beavers on the banks of the Iser, the Rhone, and the Danube, have shown to us, in the numerous experiments to which we have subjected them, that they are constantly impelled to build, without however there resulting any other advantage to

them than that of satisfying a blind necessity, which they are somehow forced to obey.

One of the errors which the exclusive observation of wild animals gave rise to and kept up, and the influence of which has been so manifestly exercised over all the systems which have had for their object the natural state of man, and the effect of different kinds of food upon his moral development, consists in the belief that the herbivora have a milder, more tractable, and more affectionate character, than the carnivora. Closer observations, more circumstantial, and more calculated to show us these animals such as they are, obliges us completely to reverse the applications of these ideas, and to transfer to the one set of animals what we had applied to the other. In fact, all the adult ruminantia, the males especially, are rude untractable animals, which no good treatment softens, nor any benefit renders captive. We have seen that the case is very different, even with the animals which feed the most exclusively upon flesh. The reason is, that the one set of animals have a coarse and limited intellect, while the others are not less remarkable for the extent than for the delicacy and activity of theirs. So true it is, that even in animals the development of this faculty is more favorable than hurtful to the good feelings or benevolent affections.

If the existence, and the various circumstances of an animal on any given part of the earth, are the consequence of the faculties and propensities with which it is endowed, and of the fixed or varying conditions which are peculiar to this point of the globe, from the moment that we know the general faculties of its species, and its dispositions, we can determine, even in advance, its individual actions in all the situations in which it may be placed? and it will no longer be required, in order to determine the mode of existence of a peculiar species in a given country, to follow them through all the details of their existence, or to hunt them for the purpose of getting hold of them; it will be sufficient to appreciate correctly the circumstances in which they are placed, which is a much easier matter, and much less subject to error.

And now that it has been established as a firm principle that animals never conduct themselves otherwise than in conformity with their situation and faculties, I may enter upon my subject, and consider the source and effects of domestication, without any fear that the facts which I may have to relate, or the inferences which I shall draw from them, will be rejected under the pretext of their not being natural.

The absolute submission which we require of animals, and the sort of tyranny with which we govern them, have led to the

idea that they obey us as absolute slaves, that the superiority which we have over them is sufficient to constrain them to renounce their natural love of independence, and to bend them to our pleasure. The cause of our error is, that judging from simple appearances, we have confounded two ideas essentially distinct, domestication and slavery. Yet these two situations have nothing in common; the distance between the domesticated animal and the enslaved man is infinite.

The animal in domesticity, from the moment that its will conforms itself to the necessities which surround it, sacrifices nothing of it; it lives in society without constraint on the part of man, because without doubt it was a social animal, and it has a chief to whose will it conforms itself within certain limits, because, probably, it had a chief. There is nothing in this that is not conformable to its propensities; it is satisfying its wants; we do not see that it experiences others; and this is the very state in which it would be, if in the most perfect liberty; only its chief is a master who has an immense power over it, and who often abuses that power; but frequently also this master employs his power to develope the natural qualities of the animal, and in this respect the animal is truly improved; it has acquired a perfection which it could never have attained in another state, under other influences. What a difference between this animal and the enslaved man, who is not only a social being, who has not only the faculty of willing, but who is moreover a free being; who is not confined to conform himself spontaneously to his situation by the blind influence which it exercises over him, but who can know it, judge of it, appreciate its consequences, and feel its restraints. And yet this liberty which may make him contemplate his situation, shows him all that is disagreeable in it; he sees that he is chained, that he can make no use of his liberty, that he must act without it, that he consequently descends beneath himself, that he is degraded to the level of the brute, that he has even fallen beneath that level; for the animal satisfying all the wants which it experiences, is necessarily in harmony with nature, while the man who does not satisfy his, who is forced to renounce the most important of all, is far from being in this state; he is in the moral world what a mutilated being or a monster is in the physical. Thought which is not exercised soon ceases to be active; and why should the thought of a man be exercised who cannot conform his actions to it? And if, notwithstanding his abject state, it preserves some degree of activity, on what will it exercise itself? The character and manners of the slaves of all ages may answer.

The difference of the resources to which we are obliged to

have recourse for subjecting animals, and for subjecting man, are sufficient to make us presume that beings which are only to be mastered by entirely opposite means no more resemble each other after than before submission, and that slavery and domesticity are widely different.

In fact, man can only be reduced to slavery and kept in it by force, the animal can only be reduced to domesticity by seduction, that is to say, only by acting upon its wants, whether for the purpose of satisfying or of weakening them.

Hence the principle that violence would be ineffectual for disposing a wild animal to obedience. Not being naturally inclined to approach us who are not of its species, it would flee from us, if it were free, at the first feeling of fear which we should make it experience, or it would hold us in aversion if it were captive. The only method by which we can attract it and render it familiar is by inspiring it with confidence, and this confidence can only be inspired by benefits. It is therefore by such benefits that all attempts to reduce an animal to a state of domestication ought to commence.

Good treatment especially contributes to develop the instinct of sociability, and to diminish proportionally all the propensities that might act in opposition to it; and for this reason, no subjection in animals is ever so complete as that which is obtained by operating an amelioration of their condition.

As our means of good treatment are various, and as the effect of each of them differs, according to the different nature of the animals on which they are made to act; the choice of them is far from being a matter of indifference, and they require to be accurately appropriated to the object in view.

To satisfy the natural wants of animals would be a means which eventually might bring about their submission, especially if applied to very young animals; but, unless the employment of this means were continued for a very long time, the bonds which it would form would be feeble. The good which, in this manner, an animal would have received from us, would have been procured by itself, had it possessed the power of acting conformably to its natural disposition. To attach animals, therefore, it would not probaly be enough to satisfy their wants; more is necessary; and it is, in fact, by increasing their wants, or by creating new ones, that we attach them to us, and, so to speak, render the society of man necessary to them.

Hunger is one of the most powerful of the means which are at our disposal for captivating animals; and as the extent of a benefit is always in proportion to the necessity which is experienced of it, the gratitude of the animal is so much the

more intense, the more necessary the food which we give it has become to it. It is in this manner that the training of horses, which have passed their first years in a state of entire independence, usually commences. After they have been caught, a small quantity only of food is given to them, and at long intervals; and this suffices to familiarise them to those who take care of them, and inspire a certain degree of affection, which the latter may turn to their advantage, by increasing their authority.

If, to the influence of hunger, there be added that of a selected food, the power which the benefit possesses may be considerably increased. In fact, it is principally by means of real dainties, and especially sugar, that we manage those herbivorous animals, which we see submitting to the extraordinary exercises of which our public circuses sometimes afford us the opportunity of witnessing.

There is one pleasure which we have transformed into a want in some of our domestic animals, which seems to be altogether artificial, and not to address itself to any particular sense; it is the pleasure of being caressed. I believe that there is no wild animal that does not ask caresses of the other individuals of its species.

But these feelings are never expressed in a striking degree; and it is but in few instances that they are accompanied with reciprocal caresses. This kind of testimony, in which the pleasure received is doubled by that given, belongs, perhaps, exclusively to man. It is from him alone that the animals have acquired the want; it is also for him alone that they experience it: with him only that they satisfy it.

All domestic animals are not, by any means, equally accessible to the influence of caresses, as they are to the influence of food, whenever they are pressed by hunger. The ruminantia appear to be little affected by them; the horse, on the contrary, seems to relish them in a very high degree, as do many of the pachydermata also, and especially the elephant. The cat is not indifferent to them; it might even be said that it sometimes seeks them with a sort of fury; but it is without dispute in the dog, that they produce the most marked effects; and what deserves attention, is, that all the species of the genus which I have had an opportunity of observing, are similarly affected by them. There was once a she wolf in the Royal Menagerie, on which the caresses of the hand and voice produced so powerful an effect, that she seemed to experience an actual delirium, and her joy was not less vividly expressed by her cries than by her motions. A jackal, from Senegal, was affected precisely in the same manner; and a common fox was so strongly agi-

tated, that it became necessary to abstain from all such expressions of kindness toward it, from a dread of the disagreeable consequences that might follow. It is worthy of being remarked, that all the three animals were females.

As soon as, by good treatment, habit has rendered the society of men indispensable to the animal, our authority may be enforced, and we may employ coostraint, and apply chastisement. But our means of correction are limited; they are confined to blows, accompanied with precautions necessary to prevent the animals from escaping; and they produce but a single effect, which consists in transforming the feeling, whose manifestation it is necessary to repress, into that of fear. But the application of force ought never to be without limits, for its excess produces two contrary effects, it either intimidates, or excites hatred. Fear, in fact, may be carried to the point of disturbing all the other faculties. With regard to resistance, it always commences on the part of the animal, at the point where our authority passes beyond the limits which time and habit had imposed upon its obedience. These limits vary with respect to each species, and to each individual; and the moment they are passed, the instinct of preservation re-awakens, and at the same time the will manifests itself with all its force and independence.

I shall not relate the numerous examples of vengeance inflicted by domestic animals, and particularly by horses, upon those who had maltreated them; the hatred which these animals have cherished towards their cruel masters, and the time during which it has been retained by them in all its original violence. Such examples are numerous and familiar; and although they ought to have shown that brutality is a means little calculated to obtain obedience, they have been ineffectual for this purpose, and animals are still treated by us as if we had nothing to subject in them but their will.

Benefits on our part are therefore indispensable to bring animals to obedience. As we are not of their species, they do not naturally experience affection for us; but it would not be so on the part of individuals towards animals which are of the same species, to which a powerful tie tends to unite them, for the constraint exercised by their kind is a natural state, a possible condition of their existence.

From the moment when they first come together, these animals are opposed to each other in the same manner as the domestic animals are opposed to man, after the latter has seduced and captivated their affections; that is to say, the one may immediately employ force for subjecting the other. The

elephant, which, by the manner in which it is rendered domestic, furnishes us with an example of this truth.

All the social animals, when left to themselves, form herds more or less numerous, and all the individuals of the same herd know each other, and are mutually attached, and live in harmony so long as no incident occurs to disturb it. But this sort of attachment exists only with reference to the individuals of the same herd; a strange individual is not at first admitted by them, they almost always receive it as an enemy, and bad treatment often reduces it to the necessity of flying.

On the other hand, every isolated individual has need of the society of its fellows: it seeks them out, approaches them, follows them at first at a distance, and, in order to be admitted, renounces its will to the point at which the feeling of self-preservation determines it to defend itself, or to withdraw.

Elephants, like all other social animals, might therefore immediately employ force for the purpose of subjecting others; and, in fact, this is what takes place in the manner in which wild elephants are reduced to domesticity.

Domesticated individuals, commonly females, are conducted to the neighbourhood of places in which wild individuals have settled. If there be in their herd one which is forced to keep separate from the rest, he quickly discovers the domestic individuals, and approaches them. The masters of the latter, who are at hand, run up, and confine the strange elephant with ropes, being protected by those which belong to them, and which, on the smallest resistance from the new comer, strike it with their proboscis or tusks, and compel it to submit to be led away.

It happens, either from the nature of individuals, or from the nature of species, that the energy of certain propensities acquires such power that no other feeling can overcome it, and under the empire of which no other feeling can ever arise. It is therefore indispensably necessary, with respect to animals which experience so imperious a desire of independence, to commence with immediately acting upon their will, to deaden their rage, in order to render them capable of fear or gratitude.

A forced state of watchfulness, is of all the modifications which an untamed animal may experience, that which is best adapted to weaken its will, and dispose it to obedience, especially when benefits and chastisements are prudently associated with it.

The means which may be employed for suspending sleep, consist in strokes of a whip, applied more or less smartly, or in a loud noise, such as that of a drum or trumpet, which is

varied to avoid the effect of uniformity, but especially in rendering hunger urgent, by withholding food; and among the observations to which these different modes of procedure give rise, there is one which it will not be without interest to dwell upon for a moment, although it does not result exclusively from the particular case which we examine, but presents itself under a variety of other circumstances.

Whatever experience these animals may have of the noise from which they suffer, they are never able to refer the cause, either to the instrument which produces it, or to the person who employs this instrument. They suffer passively, as if they experienced an internal disease; the cause, like the seat of their uneasiness, is in themselves, and yet they very correctly discern the direction of the noise. The moment they are struck by a sound, their head and ears are directed, without the slightest hesitation, toward the point from which it proceeds: there are even animals in which this action is instinctive, and precedes all experience; and with regard to the sensations, I might add, that the bull acts upon seeing a red ray, as he would under the impulse of blows. The cause of the modifications which he experiences, is in both cases entirely external; which shews us farther, that if the horse and the bull do not refer the sound to the instrument which produces it, it is less on account of the distance which separates them from the instrument, than on account of the peculiar nature of the sensations of hearing.

It is therefore by wants, over which we are able to exercise some influence, which it depends upon us to direct, to develop, or to destroy, that we are enabled to tame, and even entirely captivate animals; and, from the small number of them of which we have hitherto taken advantage, we may be allowed to think, that, in practice, we have not yet exhausted this source of the means of seduction,—and that others might be brought to our aid, should new species be rendered domestic, or new services to be demanded of those which already are so, enforce the necessity of searching them out, and induce us to make the attempt.

Hitherto I have only considered the general effects which the various means described above, produce upon domesticated animals. It will not be useless to cast a glance over those which they produce in wild animals; for the comparison that will result, will perhaps assist us in eliciting the first elements of domestication.

The monkeys, that is to say, the quadrumana of the old world, which, to the highest degree of intellect in animals, unite the organization most favorable to the developement of

all the faculties—which have the propensity to unite together, and form large herds,—appear to possess the conditions most favorable for receiving the influence of our means of taming,—and yet no adult male of this numerous tribe has ever submitted to man, whatever good treatment it may have received. At the moment when they are giving the most striking tokens of affection, they may be induced to tear one with fury; and there is no treason in this, for all their vicious qualities depend upon their excessive mobility.

It appears, however, that, by violence, and by continually keeping them in torment, they may be induced to perform certain exercises. It is in this manner that the islanders of Sumatra succeed in teaching the *Macacus nemestrinus* to ascend trees on being ordered, and collect the fruits.

We should better succeed in taming the American quadrumana with pendent tails, such as the ateles, and sapagons, which, to a high degree of intellect and the social instinct, may join an extreme gentleness and a lively desire of being caressed. With regard to the Lemuridæ, so many difficulties would be encountered in taming them, and so few advantages obtained, on account of their untractable and timid nature, that the uselessness of making the attempt would have been discovered, had it been tried. And the same remark applies to the Insectivora, which would, moreover, have the disadvantage of a very limited intellect, and of an unfavorable organization of limbs.

The carnivora, such as the lions, panthers, martins, civets, wolves, bears, &c. all of them species which live a solitary life, are very accessible to benefits, and little susceptible of fear. In a state of liberty, they retire from danger; in captivity, violence irritates them, and seems especially to carry confusion into their intellect; anger and fury then possess them. But let their wants be satisfied when they feel them keenly; let them experience goodness only on the part of their masters; let no sound of the voice, no motion, give indication of a menacing character; and these terrible animals will soon be seen approaching their benefactors with confidence, manifesting the satisfaction which they experience on seeing them, and affording the most unequivocal demonstrations of their affection. A hundred times has the apparent mildness of a monkey been followed by treachery; but never have the outward signs of a carnivorous animal proved deceitful. If it is disposed to hurt, every thing in its gestures and look will announce it, and the same will be the case when it is animated by a benevolent feeling.

The seals, which are all social animals, and possessed of uncommon degree of intellect, are, perhaps, of all the carnivora

those which would undergo the greatest modifications from our good treatment, and which would perform, with most facility, what we might require of them.

The glires, that is to say the beavers, marmots, squirrels, hares, &c. seem only to be endowed with the faculty of feeling, so little activity has their intellect. The animal of this tribe, to which we have done most good, does not distinguish us individually, and shows no more satisfaction at our presence than at the sight of any other person.

If we pass to the tapirs, the peccaris, the daman, the zebras, &c. in a word to the pachidermanta and solipeda, we find animals living in herds, which pain may inspire with fear, and good treatment render grateful, which distinguish their masters, and sometimes form very strong attachments to them.

A similar effect takes place, to a certain degree, with the ruminantia, but principally the females, for the males, without any exception I believe, have a brutality which bad treatment increases, and which good treatment does not soften.

Were our action upon animals limited in individuals, were it necessary for us, at each generation, to recommence the same labour, in order to associate them with us, we should not have had, properly speaking, domestic animals. The modifications which, fortunately, we have made those animals undergo, which we have first reduced to domesticity, have not been lost with respect to those which have been produced by them.

It is a fact universally recognized, that the young of animals have a very strong resemblance to the individuals which have given life to them. The distinctive qualities of animals of the same species, those which have most influence over their particular existence, which constitute their individuality, are those which have been developed by exercise, and whose exercise has been called forth by the circumstances amid which these animals have lived. Hence it follows, that the qualities transmissible by animals to their young, those which give rise to a mutual resemblance in them, are of a nature to arise from fortuitous circumstances; and, consequently, that we are enabled to modify animals and their progeny, or their race, within the limits which bound our power to produce the circumstances calculated to act upon them.

It is by this means that we are enabled to preserve the races in their purity, or to obtain by their mixture races having new qualities, intermediate between those which have been united.

It will not, however, be useless to remark, that the most domestic races, those which are most attached to man, are those which have experienced on his part the action of the

greatest number of the means, the use of which we have seen, for rendering them attached. Thus the dog species is indisputably the most domestic of all; while the ox species, the females of which alone experience our influence, and on which we have had no other means of acting, for the purpose of attaching them to us than feeding, is certainly that which least belongs to us. And this difference between the dog and the ox would still necessarily be increased by the difference of fecundity of these two species. In fact, the dog, in an equal time, submits to our influence a much greater number of generations than the ox. With the promptitude with which the elephant becomes domestic, it is extremely probable that if our influence could be exercised over a certain number of its generations, it would become, like the dog, one of the most submissive and affectionate of our animals, inasmuch as all the means adapted for rendering animals domestic are calculated to modify it. This transmission of individual modifications by generation does not, however, afford a basis to domestication, although it is indispensable to it. It is a general phenomenon which has been observed in the wildest animals, as in those that have been most subjected to our will.

Let us inquire, therefore, now that we know the animals which are associated with us, what is the disposition common to some and foreign to others, which might be regarded as essential to domesticity; for it is impossible to conceive how we should have succeeded in domesticating animals, had all of them resembled the wolf, the fox, and the hyena, which constantly seek seclusion, and even flee the presence of other individuals of their own species. The more we examine the question, the more evident does it become, that a high degree of intellect, great mildness of character, the fear of chastisement or the acknowledgment of benefits, are insufficient of themselves to render an animal susceptible of domestication: and that a particular disposition is indispensable to make animals submit and attach themselves to the human species, and to render its protection necessary to them.

This disposition can only be the social instinct carried to a very high degree, and accompanied with qualities calculated to aid its influence and developement; for no solitary species, however easy it may be to tame it, has afforded domestic races. In fact, it is sufficient to examine this disposition, to see that domesticity is but a mere modification of it. To establish this truth, I shall merely consider the domestic animals, with regard to man, as compared with what the social animals are with regard to one another.

When, by our benefits, we have attached to us individuals

of a social species, we have developed to our own advantage, we have directed towards ourselves, the propensity which impelled them to draw near to their fellows. The habit of living near us has become in them a want so much the more powerful, that it is founded in nature; and the sheep which we have reared is led to follow us as it would be led to follow the flock among which it was brought forth; but our superior intellect soon destroys all equality between animals and us; and it is our will which governs theirs, as the stallion, which, from its superiority, has become the chief of the herd which it leads, draws after it all the individuals of which this herd is composed. There is no resistance, so long as each individual can act conformably to the wants by which it is excited; it commences whenever this situation is changed. It is for this reason that the obedience of animals to us is not more absolute than to their natural chiefs; and if our authority is greater than theirs, it is because our means of enticement are also greater, and because we have been able to restrain, in a great degree, the inclinations which, in the natural state, would have excited the will of the animals which we have associated with us. Every thing, therefore, tends to convince us, that men who are particularly charged with the care of them, are only members of the society which these animals form among themselves; and that they are only distinguished in the general mass by the authority which they have been enable to assume from their superiority of intellect.

Thus, every social animal, which recognises man as a member and as the chief of its herd, is a domestic animal. It might even be said, that, from the moment when such an animal admits man as a member of its society, it is domesticated; as man could not enter into such a society without becoming the chief of it.

Should we now apply these principles to the wild animals, which are of a nature that renders them capable of subjection, we should see that there are several which might become domesticated, were it necessary to increase the number of those which we already possess.

The seals, perhaps, more than any other carnivorous animals, together with the various species of the dog tribe, would be the best adapted to attach themselves to us, and serve us; and it is astonishing that the fishing tribes of our species have not trained them for fishing, as the hunting tribes have trained the dog to the chase.

Almost all the pachydermata, which are not yet domesticated, might be so; and it is especially to be regretted that the tapir is still in a wild state. Much superior to the boar in size

and docility, it would afford domestic races not less valuable than those of the hog, and whose qualities would certainly be different, for the nature of the tapir, notwithstanding some points of resemblance, is very different from that of the boar.

All the species of solipeda are as capable of being domesticated as the horse or the ass; and the education of the zebra, the quagga, the dauw*, and the hemionus, would prove useful to society, and lucrative to those who might undertake it.

Almost all the ruminantia live in herds, and most of the species of this numerous family are of a nature that qualifies them for domestication. There is one, in particular, and perhaps even two, that are already half domesticated, and which it is matter of regret that we do not see among the number of our domestic animals, for they would have two very valuable qualifications,—they would answer as beasts of burthen, and would furnish fleeces of excellent quality. The animals of which I speak are the Alpaca and the vicugna. They are double the size of our largest breeds of sheep; the qualities of their fur are very different from those of wool, properly so called, and might be manufactured into cloths, which would partake of these qualities, and thus give rise to a new branch of industry.†

I shall now bring my observations upon domestication to a conclusion. My object has been to show its true character, as well as the relations of the domestic animals to man. It rests upon the propensity which animals have to live together in herds, and to attach themselves to one another. We obtain it only by enticement, and principally by augmenting their wants and satisfying them. But we could only produce domestic individuals and not races, without the concurrence of one of the most general laws of life, the transmission of the organic or intellectual modifications by generation. Here one of the most astonishing phenomena of nature manifests itself to us, the transformation of a fortuitous modification into a durable form, of a fugitive want into a fundamental propensity, of an accidental habit into an instinct. This subject is assuredly worthy of exciting the attention of the most accurate observers, and of occupying the meditations of the most profound thinkers.

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* The *Equus montanus* of Burchell.

† The difference of climate has been stated as an insurmountable obstacle to the naturalization of the animals of warm countries in our northern regions. This error would have been avoided, had the resources of nature and the extent of our means of acting upon animals been better known. By a similar error, the same difficulty has been opposed to the introduction of the alpaca and vicugna into Europe, animals which live only in very temperate regions; but it would not even be applicable to the tapir, although a native of the warmest countries.