

SPK

165
919836



THE

MENAGERIES.

QUADRUPEDS,

DESCRIBED AND DRAWN FROM LIVING SUBJECTS.

VOLUME THE THIRD.

LONDON:
CHARLES KNIGHT AND CO.,
22, LUDGATE STREET.

1840.

599

~~599~~

~~12~~

TRANSFERRED FROM
Imperial Library, 12 MAY 1903

LONDON:
Printed by WILLIAM CLOWES and SONS,
Stamford Street.

Acc no. 385
11-06
24-11-06

385
24/11/06

599
MEN
V. 3

Mammals

590

CONTENTS.

THE MENAGERIES.—VOLUME III.

CHAPTER I.

	PAGE
THE RHINOCEROS	1

CHAPTER II.

THE HIPPOPOTAMUS	79
----------------------------	----

CHAPTER III.

TAPIR	117
-----------------	-----

CHAPTER IV.

THE HOG	141
Papuan Hog	186
African Wood Swine	187
Babiroussa	192
African Boar	197
Peccary	199

CHAPTER VI.

	PAGE
THE OX	210
The Zebu	234
The Ox, resumed	24
The Gyall	289
The Yak	290

CHAPTER VII.

THE BUFFALO	294
-----------------------	-----

CHAPTER VIII.

THE BISON	342
The Zubr	352
The Musk Ox	362

CHAPTER IX.

THE SHEEP	371
---------------------	-----

CHAPTER X.

THE GOAT	441
--------------------	-----

XIII U. 35

ILLUSTRATIONS.

	PAGE
1 Common Indian rhinoceros	1
2 Young Indian rhinoceros	8
3 Rhinoceros of Java	33
4 Common African rhinoceros	42
5 Rhinocerus simus	67
6 Rhinocerus ketloa	68
7 Hippopotamus	79
8 Upper part of skull of hippopotamus	85
9 Under part of skull of ditto	85
10 Lower jaw of ditto	86
11 American tapir	117
12 Young tapir	132
13 Indian tapir	134
14 English sow	141
15 Female wild boar and young	152
16 Boar-hunt in Europe—middle ages	158
17 Boar-chase	164
18 Boar-hunting in India	166
19 Skull of babiroussa	194
20 African boar	197
21 Peccary	200
22 Chillingham wild bull	210
23 Ploughing : from Flaxman's designs for the shield of Achilles	226

	PAGE
24 Ancient troughs	227
25 Rrahmin bull	242
27 Ox-carriage	244
28 Common English bull	258
29 Spanish bull-fight	269
30 Throwing the bull	276
31 The gyall	289
32 Tiger attacking a buffalo	296
33 Bull of the ampagna of Reme	319
34 La Botta. Buffalo-baiting	322
35 Skull and horns of arnee	326
36 Cape buffalo	327
37 Bison Europæus	342
38 "Bison Americanus"	345
39 Female bison of North America	349
40 The musk ox	362
41 The mouflon	376
42 Head of the East Indian argali	382
43 Fat-tailed sheep	401
44 Guinea sheep	405
45 Common goat	441
46 The paseng	443
47 Dexterity of a goat	448
48 Cashmir goat	452

THE MENAGERIES.

CHAPTER
THE RHINOCEROS.

ALIPORA
385
11-06



Common Indian Rhinoceros.

THE genus *rhinoceros* was placed by Linnæus in his order *bruta*; an order including the sloths, the anteaters, the manis, the armadillos, the elephant, and

the morse, but excluding the horse, the hippopotamus, the tapir, and the hog, which ranged under his genus *bellua*. In the system of Cuvier, the genus *rhinoceros* ranks in the order *pachydermata*,* an order which, notwithstanding the chasms that intervene between the forms it embraces (chasms which the discoveries of geologists are constantly filling up), we cannot but regard as based upon solid principles. Of this order (fossil forms being excepted), one genus alone is exclusively restricted to the new world, viz., that including the peccaries (genus *dicotyles*, Curv.), and one is divided between South America and the larger islands of the Indian archipelago, together with the peninsula of Malacca—we mean the genus *tapir*, Linn., of which there are three species known, and of these two are American. All the other genera are divided between Africa, Asia, and Europe, though, as might be expected, Europe claims the smallest share of indigenous *pachydermata*. It is in this order that we find the hugest and most ponderous of *terrestrial mammalia*—animals requiring for the due development of their colossal frame the warmth of an intertropical climate, and a never-failing supply of food. Mighty forests that border wide rivers and lakes, swamps and morasses, where vegetation assumes a luxuriance unequalled beneath our northern sky, are their favourite haunts; and there, save when molested by man, the most formidable of their enemies, they lead a life of tranquillity and enjoyment. What, indeed, can be successfully opposed to the unwieldy strength of the elephant, rhinoceros, or hippopotamus, excepting the artifice and weapons which reason teaches man to employ, and which render the human race supreme over the mightiest of the brute creation?

* From Πάχος, thick, and Δέρμα, skin.

Amongst the *pachydermata* the genus *rhinoceros* holds a conspicuous place: the animals of this genus, though inferior in size to the elephant, astonish by their massive and clumsy figure, and by the tremendous strength displayed when their energies are roused by aggression. Till very lately, the appearance of a living rhinoceros in our island has so rarely occurred, that few have been able to form a correct idea of its extraordinary conformation, which, independent of the novelty of the spectacle, is replete with interest. Since the year 1834, however, when the Zoological Society of London became possessed of the Indian rhinoceros, which is one of the greatest treasures of their *vivarium*, four or five individuals have been imported, and are, we believe, at present in the country; but though the astonishment which the animal, from its novelty, at first excited may be somewhat abated, the interest which attaches to it as one of the most extraordinary of the larger quadrupeds tenanting our globe can never diminish. It may yield perhaps in this point to the elephant—the structural peculiarities of which are unique among extant mammalia; and it certainly does not excite that sort of interest which attaches to this latter animal from its docility and submission to man, of whom it has been the obedient servant from the earliest periods of antiquity.

The general contour and proportions of the rhinoceros have long been known; but the earlier figures of the animal are, to a certain extent, incorrect and exaggerated. Where living specimens are inaccessible, artists and naturalists are liable to mistakes which are too often perpetuated, and which indeed are not always easily eradicated. It was in the year 1513 that Albert Durer, the celebrated painter of Nuremburg, drew from life the figure of a rhinoceros, which was sent from India to Emmanuel,

king of Portugal, and for many years this figure served as a general copy: it is repeated in the work of Aldrovandus ('Aldrov. Bisulc.' 884), and in Jonston's 'Quadrupeds' (tab. 38). The folds of the skin are exaggerated, but much more the tubercles with which the hide is studded, these having the appearance of scales, or rather shells of considerable elevation. Errors of this kind, with which the best works on natural history formerly abounded, are now in little danger of being repeated: natural history has received a new impetus; and the encouragement of scientific pursuits, by the desire of all classes to become instructed, tends to the elucidation of truth.

In stimulating this desire, and, at the same time, in satisfying it, the establishment of a well-ordered menagerie by the Zoological Society, in which living specimens of the rarest and most curious animals may be inspected, has taken a leading part: on the other hand, that the newly-awakened thirst for knowledge re-acts beneficially upon scientific institutions may be inferred from the fact that the Zoological Society, with laudable zeal, and feeling assured of the interest which the accession of a living rhinoceros would excite, hesitated not to purchase their splendid specimen at the price of 1000 guineas. Hence the desire of the public to be instructed in natural history supplies the means for such instruction, and an inducement for the scientific man to exert his energies for the public good. There is an indissoluble connection between the desire of the many for instruction, and the ability of the few to instruct; and this connection is not likely, we think, to be dissolved by those who fancy that knowledge cannot at once be both popular and accurate. In this department of knowledge; at any rate, there was the least accuracy when there was the least general desire for instruction; and the errors of naturalists especially have ceased to be

multiplied as the objects of these errors have come more within the observation of general observers and inquirers.

The species of the genus *rhinoceros* are equally divided between India and Africa. Three belong to India and the islands of Java and Sumatra; and, of these three, two are furnished with only a single nasal horn; the Sumatran species having two—three belong to Africa, and these possess double nasal horns, one seated anterior to the other, the first being by far the most developed. There arises, however, notwithstanding the positive testimony of Bruce and Salt to the contrary, a question, founded on the authority of Burckhardt, as to the existence of a one-horned species in Abyssinia. Bruce gives a long account of a two-horned species; and Salt assures us that it resembles the Cape species, figured by Barrow; but, on the other hand, Burckhardt says that, in the neighbouring country, above Sennaar, it is the one-horned rhinoceros that is found, and that the negroes there give it the curious name of “the mother of the one horn.” According to Burckhardt, its northern boundary, like that of the elephant, is the range of mountains to the north of Abou Huaze, two days’ journey from Sennaar: these mountains advance close on the Nile, and intercept the passage along the banks of the river; neither elephant nor rhinoceros is found in its free state below this point of the Nile. The hide of this animal is manufactured into shields, which are sold at Sennaar, all along the Nile, and across the mountains as far as Kosseir and Kenne in Upper Egypt. The material of the horn is very dear, Burckhardt having seen four or five Spanish dollars paid for a piece four inches long and one inch thick.

It yet remains to be proved whether Burckhardt be correct or not: we are inclined to believe that he

is; for Pliny, in the 8th Book, says that at the triumphal games of Pompey was exhibited a one-horned rhinoceros, such as is usually seen. (*Isidem ludis et rhinoceros, unius in nare cornus, qualis sæpe visus.*) Augustus, in the celebration of his triumph over Cleopatra, gave both a rhinoceros and hippopotamus to be slain in the circus, and Dio Cassius indirectly states the rhinoceros to have been one-horned: *cornu autem ex ipso naso prominens habet.* Strabo describes a one-horned rhinoceros which he saw at Alexandria, and notices the folds of its skin: could this have been brought from India, or is it not more probable that it was procured in the interior of the country? The Romans, however, were well acquainted with the two-horned species of Africa. Pausanias describes a two-horned species under the title of "Æthiopian Bull." Two individuals of the same species appeared at Rome during the reign of the Emperor Domitian, on some of whose medals was impressed their figure. We hear of the exhibition of these animals under Antoninus, Heliogabalus, and Gordian III. Cosmas describes the two-horned species of Æthiopia, and states that its horns are moveable, which is a mistake.

Whatever opinion may be formed regarding the existence of a one-horned rhinoceros in Abyssinia, and the acquaintance of the ancients with it, it is very clear that the two-horned species of Æthiopia (whichever of the three species known at present it may prove) was an animal with which the ancient Romans were familiar, and which was frequently exhibited in their games. In modern time, on the contrary, the two-horned rhinoceros has never been brought to Europe, and indeed until lately the distinguishing characters of the animal were unknown. Hence the apparent obscurity of some of the epigrams of Martial, wherein the two horns are

noticed. Dr. Parsons was the first to point out and establish the specific distinctions between the Indian and the African rhinoceros. "We must not omit, however, to observe that Kolbe, Flaccourt, and others, had always regarded the South African rhinoceros as having two horns; and that Colonel Gordon described the animal in detail, and that his description was inserted by Allamand in the 'Supplémens de Buffon.' Sparrman, the Swedish traveller, also described this animal, both in his 'Relation of his Travels,' and in the 'Memoirs of the Academy of Sweden, 1778.' The differences in the dental formula of the Indian and South African rhinoceros were further discussed by Camper, who proved that, as Sparrman had previously stated, the Cape rhinoceros has 28 molars, without incisors, and that Dr. Parsons was correct in describing the incisors of the Indian species as separated from the molars by an intervening space.

It is time, however, that we pass from these general observations to a more particular description of the species; and we shall begin by an account of those peculiar to India and its islands.

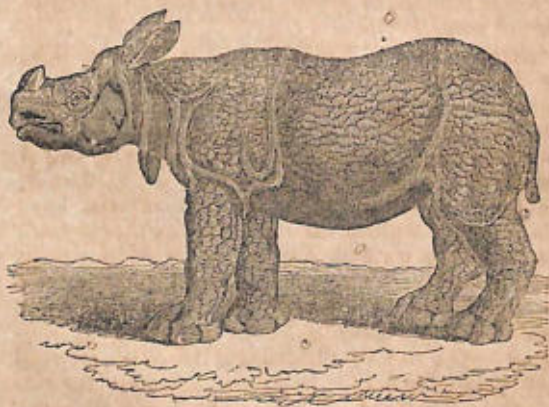
We have already stated that three species of rhinoceros are indigenous in this portion of the globe.—These are, 1st, the common one-horned, or Indian rhinoceros (*Rhinocerus Indicus*, G. Cuv. and Desm. *Rh. unicornis*, Linn.); 2ndly,—the Javanese Rhinoceros,—(*Rh. Javanicus*, G. Cuv. *Rh. Sondaicus*, Desm.); and 3rdly, the Sumatran two-horned rhinoceros (*Rh. Sumatranus*, Sir S. Raffles, *Rh. Sumatrensis*, G. Cuv.).

The common Indian rhinoceros is the only example of the genus which, in modern times, has been brought alive to the shores of Europe. The first instance on record has been already alluded to; viz., that of the one figured by Albert Durer: it was sent from India to Emmanuel, king of Portugal, A.D.

1513, by whom it was presented to the Pope; but the animal, being seized during its passage with a paroxysm of fury, caused the destruction of the vessel in which it was embarked.

In 1685, a second was exhibited in England;—and in 1739, a third was shown through most parts of Europe. From this specimen Dr. Parsons took his description and figure, published in the *Phil. Transactions*. In 1741, a fourth (a female) was exhibited, and is noticed also by Dr. Parsons. Cuvier regards this as identical with the individual exhibited in Paris in 1749, which was painted by Oudri, and afterwards figured by Edwards, in his *Gleanings*, in 1752. (See pl. cexxi.)

In 1771 a young specimen arrived at Versailles,



Young Indian Rhinoceros.

and died in 1793, at the age of about 26. Buffon notices it in his *Supplement*, vol. iii.

In 1806 a young specimen died at London on its way to Germany, (being destined for the menagerie

of the Emperor,) and was dissected by Mr. Thomas, who published his observations in Phil. Trans.

Subsequently, in 1813 or 1814, we ourselves saw a specimen exhibited in England, which was taken to Paris in 1815, and described by M. Fred. Cuvier, in his work on the animals of the menagerie.

In May, 1834, the Zoological Society purchased their splendid specimen, and several individuals have been since imported.

The Indian rhinoceros is far more widely distributed than are its two immediate congeners: it is abundant in the forests and hills of the lower region of Nepal; and it inhabits the watered plains of India, Pegu, Siam and Cochin China, usually associating in small herds, which tenant the covert of dense jungles, or woods, remote from the habitations of men.

Clumsy, massive, and low on the limbs as it is, the rhinoceros is more prompt and rapid in its movements than its uncouth form would lead a person unacquainted with its habits to anticipate. In sluggishness of appearance it is indeed exceeded only by the hippopotamus. The body is protuberant, the belly almost touching the ground; the back falls from the withers and rises again on the crupper; the head is a ponderous mass, supported by a short and powerful neck; the shoulders are massive, and the limbs present the appearance of short stout pillars, for the superincumbent weight to be sustained. The feet are divided into three toes, encased each in a solid hoof. In its *tout ensemble* the rhinoceros reminds us of a huge hog, and its heavy movements contribute to strengthen the resemblance.

The peculiarities of form, however, which this animal displays require a more careful scrutiny. Elevated at the back part, or occiput, the profile of

the head sweeps downward with a decided hollow or concavity, which is at its *maximum* just above the eyes: it again rises over the nasal bones which support the horns, and terminates in a pendent but very flexible muzzle or upper lip. On each side of the occipital summit of the head are placed the ears, which are large, open, pointed, and very moveable; the animal freely turns them in every direction: its sense of hearing, as might be expected, is extremely acute. The eyes are very small, but bright, and prominent: their situation is remarkable; they seem as if placed rather on each side of the snout than in the ordinary position, being in fact nearer to the muzzle than in most animals, so that a slight turn of the head brings an ample circuit within their range of vision. Dr. Fordyce says that this position of the eye is for the purpose of rendering it "capable of performing the most essential of its functions, viz., that of examining the food necessary to its subsistence;" it is rather, we think, an adaptation to remedy the obstruction which the bulk of the body would oppose towards its range of survey, which, were the eyes placed high in the head, would be much more limited than is the case. The structure of the eye is not less remarkable than its position. Mr. Thomas informs us that, on dissecting the eye of the rhinoceros, he observed four processes of a muscular appearance arising by distinct tendons from the internal, or posterior portion of the sclerotic coat, evidently intended to effect such changes in the axis of organ as to adapt it for distinct vision at different distances,—a provision in beautiful harmony with its peculiarity of situation.

But, that which gives most character to the head of the rhinoceros is its horn, which, as we have said, is double in some species. This organ is of an elongated

recurvent conical figure, arising from a broad, limpet-shaped base, seated on the nasal bones, which are of a thickness and solidity not to be found in other races of quadrupeds. They form a vaulted roof, elevated in a remarkable degree above the intermaxillary bones, containing the incisor teeth, and their upper arched surface is rough with numerous irregularities and depressions; and here we may pause, to reflect on the advantages gained by their form and structure. They have not merely to sustain the weight of the horn, no trifle in itself, but to resist the shock occasioned by the violent blows which the animal gives with the weapon upon various occasions. Hence, conjoined with their solidity, that form is given to the nasal bones which, of all others, is best calculated for sustaining a superincumbent weight or sudden jars; while the rugosities and depressions tend to the firmer adhesion of the skin to which the horn is immediately attached. In the two-horned species, the posterior horn rests on the os frontis.* When we speak of *horns*, our imagination pictures such as we are familiar with in the ox; but it must not be supposed that the nasal horn of the rhinoceros presents a similar structure. The horn of the ox consists of a bony core, or process from the skull, encased in a horny sheath. The nasal horn of the rhinoceros is a solid mass, structurally composed of agglutinated fibres, analogous to hair, and much resembling those into which *whalebone* is so easily separable. The horny sheath in the ox, goat, or antelope, is indeed also thus composed, but it covers, as we have said, a bony process from the skull itself. Here there is no bone, the whole mass being secreted, fibre by fibre, from the skin, to which it is firmly attached—

* Geoffroy, 'Mémoires de la Société d'Histoire Naturelle de Paris.'

this being as firmly attached to the nasal bones, so that the horn is almost, if not quite, immoveable.* The rostrils are longitudinal and somewhat S-shaped slits on each side of the upper lip. This, as we have said, hangs down over the under lip in the shape of a short pointed kind of proboscis, endowed with great flexibility, and capable of being used as an organ of prehension. The under lip is round and fleshy. The tongue is perfectly smooth, contrary to what is alleged by many of the older writers, who describe it to be so rough as to be capable of lacerating the skin. Marco Polo thus speaks of the tongue of the rhinoceros; and Bontius, a Dutch physician, who wrote on the productions of Java, in 1629, asserts the same. Others have repeated the error, which it has been reserved for naturalists of the present day to contradict. Sparrman, the Swedish traveller, observes, in his account of the African rhinoceros, that he thrust his hand into the mouth of one just shot, and found the tongue perfectly smooth and soft, contrary to the general opinion.

According to M. Cuvier the rhinoceros of Java has four incisor, and twenty-eight molar teeth; but it would seem that this does not include the small ex-

* The following seems to be Mr. Burchell's theory respecting horns in general. He supposes that the pores of the skin secrete a *corneous matter*. When the pores are separate, they produce hairs. They have an insertion not deeper than the thickness of the skin, and their growth takes place by the addition of new matter at their base. When the pores are confluent, and in a line, they produce nails, claws, hoofs. When the pores are confluent, and in a ring, they furnish the corneous case of the horns of animals of the ruminating class; and when confluent, or in a circular area, they supply matter for the formation of solid horns, such as we see in the rhinoceros. It grows from the skin only, and in the same manner as the hair. It is not at all extraordinary, that the rhinoceros should possess the power of moving its horn, although by no means so loose as some writers have supposed.

ternal incisors of the upper jaw, nor the intermediate ones of the lower, which had been lost in the specimen examined by M. Cuvier. The number also appears to vary in the different species. None of the species have canine teeth.

Of all the *Pachydermata*, the Indian rhinoceros is most distinguished for the density of the skin; nor does it lie smooth over the body, as in the African species, or the *hippopotamus*, but it is thrown into large folds, which add to the uncouth appearance of the animal, and form a sort of armour, very difficult to be pierced: hence it is manufactured into shields, and the like.* The arrangement of the folds, or rather solid plates, with folded edges, is as follows:—Around the neck, which is short and deep, the skin forms two deep folds, of which the last hangs over the front of the chest. The shoulders are covered with a thick hard plate, falling in a fold over the top of the fore limbs, and separated also by a deep posterior fold from the plate covering the body. This is folded across the top of the crupper, the fold running down just before the haunch bones, and losing itself on the belly. The crupper-plate is divided by a longitudinal fold, running to the root of the tail on each side, from a large crural plate, which hangs in a deep fold over the thighs. Between the folds the skin is soft and flexible, and of a pale pink or flesh colour; but everywhere else it is hard and dense, and covered with tubercles or horny incrustations. Hence, were it not for these folds, the animal would be necessarily limited in his motions. In speaking of this subject, Dr. Parsons observes, that if the skin, thus hard and inflexible, were “continued all over the creature, as

* Bishop Heber found the natives (at Baroda) making use of the hide for the purpose of defensive armour. One warrior had “a very large shield of transparent rhinoceros-hide, with silver studs.”

the skins of other animals, without any folds, he could not bend any way, nor perform any necessary action; but that suppleness in the skins of other quadrupeds, which renders them flexible in all parts, is very well compensated in this animal by those folds; for, since it was necessary his skin should be hard for his defence, it was a noble contrivance that his skin should be so soft and smooth underneath, that, when he bends himself any way, one part of his board-like skin should slip, or shove over the other, and that these several folds should be placed in such parts of his body as might facilitate the performance of every voluntary motion he might be disposed to."

On the ears there are a few stiff bristles, and similar bristles fringe the tail on each side at its tip. With these exceptions the skin is naked and of a dark greyish black, with a slight tinge of purple. Hard and dense as this integument is, it is nevertheless far from being destitute of sensibility; to the bites and stings of insects, which abound in the swampy places tenanted by the rhinoceros, the animal is perpetually subject, and it is by way of protection against these petty but multitudinous tormentors that he rolls in the slimy marsh, so as to cover the body with a layer of mud, which not only resists their attacks, but at the same time also defends the skin from the effects of a burning sun. Hence the partiality of the rhinoceros for localities which abound with water:—it is not however only in the mud-bath that the animal revels,—he delights in the water itself, and swims with ease and vigour. But, independent of the instinctive partiality which this animal manifests for the swamp, or border of the river, necessity restricts him to such localities: the quantity of vegetable aliment and of water he consumes is very great; and in such places, beneath

an Indian sky, nature provides him with a never-failing magazine of food. Suppose an animal, requiring for his daily support from sixty to seventy pounds' weight of vegetable matter, and fourteen or fifteen gallons of water, were placed in the midst of a scantily watered district, with a meagre crop of herbage, slowly renovated, and it needs no imagination to conceive the straits to which he would be soon reduced. Nature, however, in appointing every animal to a given locality, makes no such errors,—and in endowing the huge *Pachydermata* with instincts leading them to affect the water, she at the same time places the means of sustenance immediately within their attainment. Where they exist, there alone are they fitted to exist, and to that spot are they bound by instinct.

In a state of nature the rhinoceros leads a calm but indolent life:—sluggish in his habitual movements, he wanders along with a heavy measured step, carrying his huge head low, so that his nose almost touches the ground, and stopping at intervals to uproot with his horn some favourite vegetable, or in playful wantonness to plough up the ground, throwing the mud and stones behind him. As he passes through the tangled coverts every obstacle gives way before his irresistible strength, and his track is said to be often marked by a line of devastation in his rear. Inoffensive but fearless, the rhinoceros when roused is a most tremendous antagonist; and such is the keenness of his sense of smell and hearing, that, except by very cautiously approaching him against the direction of the wind, it is almost impossible to take him by surprise. On being thus disturbed he usually endeavours to make a peaceful retreat, but not always, and instances are on record in which he has at once advanced with fury to the attack. “A few years ago,” says the

translator of Cuvier's Animal Kingdom, "a party of Europeans, with their native attendants and elephants, when out on the dangerous sport of hunting these animals, met with a herd of seven of them, led as it appeared by one larger and stronger than the rest. When the large rhinoceros charged the hunters, the leading elephants, instead of using their tusks or weapons, which in ordinary cases they are ready enough to do, wheeled round and received the blow of the rhinoceros's horn upon the posteriors: the blow brought them immediately to the ground with their riders; and as soon as they had risen the brute was again ready and again brought them down; and in this manner did the contest continue until four out of the seven were killed, when the rest made good their retreat." We are not to infer from this account that there is any natural antipathy between the elephant and the rhinoceros, though Pliny asserts such to be the case, in which he is followed by the early writers. In the German inscription attached to the picture of the rhinoceros by Albert Durer of Nuremburg, which came into the possession of Sir Hans Sloane, (the translation of which is in the Phil. Trans. for 1744,) it is stated as follows:—"In the year 1513, upon the 1st day of May, there was brought to our king at Lisbon such a living beast, from the East Indies, that it is called *rhinocerate*: therefore on account of its wonderfulness I thought myself obliged to send you the representation of it. It hath the colour of a toad, and is covered over with thick scales. It is in size like an elephant, but lower, and is the *elephant's deadly enemy*: it hath on the forepart of its nose a strong sharp horn; and when this beast comes near the elephant to fight with him, he always first whets his horn upon the stones, and runs at the elephant with his head between his forelegs; then rips up the elephant,

and so gores him. The elephant is terribly afraid of the *rhinocerate*, for he gores him whenever he meets an elephant, for he is well armed and very nimble. This beast is called *rhinocero* in Greek and Latin, but in Indian *gomda*."

The fact is that there are seasons in which the rhinoceros becomes excessively furious; and upon any animal large enough to attract his notice, which intrudes within the precincts of his haunt, he rushes with impetuous violence. Between his mode of attack and that of the wild bear there is much similarity, save that the latter strikes with his tusks and the former with his horn; in each case the blows are directed more or less obliquely upwards, and repeated with great rapidity. The power and ferocity displayed by the rhinoceros when roused to the combat are very great; hence, as among the Romans, this animal is exhibited by the native princes of India in the barbarous sports of the arena, where it is opposed to the tiger or some other beast of prey: as may be expected, the rhinoceros is usually victorious, but provocation is needed to urge him to the attack, for he does not seek the contest, and only acts upon the defensive.

Captain Mundy, the author of a recent and very amusing work, in giving an account of the wild beast fights at Lucknow, in the king of Oude's park, thus describes the introduction and behaviour of a rhinoceros, which was probably one of the five or six large animals of that species seen at the same court by Bishop Heber:—

"A rhinoceros was next let loose in the open court-yard, and the attendants attempted to induce him to pick a quarrel with a tiger who was chained to a ring. The rhinoceros appeared, however, to consider a fettered foe as quite beneath his enmity; and having once approached the tiger and quietly

surveyed him as he writhed and growled, expecting the attack, turned suddenly round, and trotted awkwardly off to the yard-gate, where he capsized a palankeen which was carrying away a lady fatigued with the sight of these unfeminine sports.”*

In an abstract of a paper on the Mammalia of Nepâl, by Mr. Hodgson, published in the Proceedings of the Zoological Society of London, for 1834, p. 96, we are informed that the rhinoceros is abundant (as is the elephant also) “in the forest and hills of the lower region, whence in the rainy season they issue into the cultivated parts of the Tarâi to feed upon the rice crops.” “The rhinoceros goes with young from 17 to 18 months, and produces one at a birth. At birth it measures three feet four inches in length, and two feet in height. An individual, born at Katmandoo eight years since, measures now nine feet three inches in length, four feet ten inches in height at the shoulders; the utmost girth of his body is ten feet five inches, the length of the head two feet four inches, of the horn five inches; he is evidently far from being adult. It is believed that the animal lives for 100 years: one taken mature was kept at Katmandoo for 35 years without exhibiting any symptoms of approaching decline. The young continues to suck for nearly two years. It has when born, and for a month afterwards, a pink suffusion over the dark colour proper to the nature hide.”†

It is generally admitted by the ablest commentators that the unicorn or reem of Scripture is the rhinoceros, and though this opinion be not absolutely proved, it is at all events probable. The circumstance of a *one-horned* animal being intended need not startle us when we recollect the

* ‘Pen and Pencil Sketches,’ being the Journal of a Tour in India.

description of a one-horned species by Strabo which he saw at Alexandria, and the notice of Pliny and Dio Cassius, to say nothing of Burckhardt's testimony to the existence of such an animal in the country above Sennaar. We here also observe that though Bruce describes and figures (we may say distorts) a two-horned species in Abyssinia,* yet he says, "It is certain that the one-horned rhinoceros is found towards Cape Gardafui by the Straits of Babelmandel, and, if the natives are to be believed, the one-horned is also found in the kingdom of Adel."—*Bruce*, v. p. 85.†

However this may be, the picture drawn in the book of Job is very striking: "Canst thou bind the unicorn with his band in the furrow?—or will he harrow the valleys after thee? wilt thou trust him because his strength is great? or wilt thou leave thy labour to him." We have here vast powers, stubbornness, and indolence, depicted as forming the characteristics of a one-horned beast, with which we may suppose the writer to have been acquainted. But there is a curious coincidence between a passage in the Psalms and a popular belief in the virtues of the horn of the rhinoceros, which seems to have escaped observation: "My horn," says the Psalmist, "shalt thou exalt like the horn of a unicorn." The horn among the ancients was a symbol of power or high elevation: Jupiter Ammon is represented as having horns; and Michael Angelo, following up the idea, in his celebrated statue of Moses, sculptured the head as horned. But why is the expression, "like the horn of a unicorn," made

* His figure appears to be a mere copy of Buffon's Indian rhinoceros, to which he has given a second horn.

† "At the royal stables at Ispahar there was a rhinoceros with one horn: it was brought for the king by an ambassador from Ethiopia."—Sir John Chardin's *Travels*.

use of? Not because the animal carries his head aloft, for the contrary is the case, but because (at least such is our impression) the horn of the rhinoceros was esteemed above all other horns: it was supposed to possess mysterious properties,—to be capable of curing diseases, and discovering the presence of poison; and in all countries where the rhinoceros exists, but especially in the East, such is still the opinion respecting it. In the details of the first voyage of the English to India, made in 1591, we find the rhinoceros designated as the *abath*, or *abadia*, and are informed that, between Malacca and Pegu, a trade was opened with the king of those parts for ambergris, and rhinoceros-horns, both which articles were monopolised by the sovereign, the latter probably on account of their imaginary virtues in detecting the presence of poisons.

Thunberg observes, in his 'Journey into Caffra-ria,' that "the horns of the rhinoceros were kept by some people both in town and country (Cape of Good Hope), not only as rarities, but also as useful in diseases and for the purpose of detecting poisons." As to the former of these intentions, the fine shavings were supposed to cure convulsions and spasms in children.

With respect to the latter, it was generally believed that goblets made of these horns would discover a poisonous draught that was put into them, by making the liquor ferment till it ran quite out of the goblet. "Such horns as were taken from a young rhinoceros calf that had not yet copulated were said to be the best, and the most to be depended upon. Of these, goblets are made which are set in gold and silver, and made presents of to kings, people of distinction, and particular friends, or else sold at a high price, sometimes at the rate of 50 rix-dollars a goblet. The horn is of a conical

form, thick at the bottom, and truncated at the top, a foot long frequently in old rhinoceroses, and is placed forward on their snout. Two or three inches from this, the African two-horned rhinoceros has another smaller and shorter horn: in colour it most resembles the horn of a bullock. When I tried these horns, both wrought and unwrought, both old and young horns, with several sorts of poison, weak as well as strong, I observed not the least motion or effervescence; but when a solution of corrosive sublimate, or other similar substance, was poured into one of these horns, there arose only a few bubbles, produced by the air which had been inclosed in the pores of the horn, and which was now disengaged from it."—*Thunberg*.

Rankin, in his 'Wars and Sports,' observes that going through the sunderbunds of Bengal he fell in with a man who "possessed a small horn of a rhinoceros that had been killed in the woods, and this man (a Portuguese) had the same *universal* opinion of its virtues. On being asked how it ought to be used, he said that he put a small quantity of water in the concave part of the root, when held with the point downwards, and stirred the water with the point of an iron nail till it was discoloured, when the patient was to drink it."

The ivory of the elephant and the horns of the rhinoceros (animals which abound in the woods of Cochin China and are hunted by the natives) are a *royal monopoly*. "The horn of the rhinoceros," says an intelligent American officer, "is formed much like a limpet-shell, but more pointed: at its base it is generally about six inches long by four inches wide, and protrudes about six or eight inches. There is a shallow concavity, occupying the whole base, resembling the limpet also in that respect. To judge of the goodness of a rhinoceros' horn, this concave

part is put to the ear, and the greater the noise, resembling that of the waves on the sea-beach, the better the horn. This criterion certainly appears fallacious, if not ridiculous; but the Chinese, who are accustomed to purchase these articles, are always determined by this test."—See 'Voyage to Cochin China, in the years 1819-20, by John White, Lieut. in the U. S. Navy.'

Calmet, in his Dictionary of the Bible, published about 120 years since, observes that the horn of the rhinoceros is made use of by the Indian kings at table, because, as is believed, "it sweats at the approach of any kind of poison whatever."

It would not be difficult to muster a host of authorities on this point. Indeed most travellers who have visited the native regions of the rhinoceros have alluded to the great value set upon the horn from its imaginary virtues; and as no other horn has been or is now regarded in the same light, we are inclined to consider this horn of power and excellence, in which the poisoned draught of secret malice discovers itself, to be that to which the Psalmist alluded, and consequently that its bearer, the "unicorn," was the rhinoceros. In conjunction with these almost miraculous properties, the formidable nature of this horn as a weapon of defence, before which, used as the rhinoceros uses it, no enemy can stand, might also have been taken into the account.

Heavy and sluggish as is the rhinoceros, he is subject to sudden transports of ungovernable fury, during the continuance of which he rushes against every object in his way, striking with his horn, and throwing his whole power into every blow. We have already adverted to the instance of the individual sent by Emmanuel, king of Portugal, to the Pope, causing the destruction of the vessel in which it was embarked. M. Frederick Cuvier, in his de-

scription of the specimen exhibited in the menagerie at Paris, in 1815, notices these paroxysms of rage which caused no little anxiety on the part of his keepers. This description is in many respects so interesting that we shall not hesitate to present some portion of it to our readers:—

“At the time the figure was taken of this rhinoceros,” he observes, “the animal was but young; and contrary to the received opinion, was of a very gentle disposition, obedient to his keeper, and receiving his care and attention with real affection. However, he would occasionally be seized with fits of fury, during which it was not prudent to come near him. No cause could be assigned for these violent paroxysms. One might say that a blind impulse or desire to gain a state of liberty (which he had never enjoyed) excited him to break his chains and escape from the bondage in which he was retained. Bread and fruits, however, always pacified him, and the claims of hunger always silenced those of liberty; so that this resource against his fury was always kept in reserve. He knew those persons who most indulged him in his *gourmandise*, and they were received with the liveliest manifestations of affection: the moment he saw them he stretched towards them his long upper lip, opened his mouth, and drew in his tongue. The narrow stall in which he was confined did not allow him to manifest much intelligence; and his keeper took no other pains than to induce him to forget or misconceive his own strength, and to obey; but from the attention he paid to everything passing around him, and from the readiness with which he distinguished individuals, and recognised those circumstances which seemed preliminaries of his receiving something agreeable to him, one can readily judge that his intelligence would have acquired a greater development under favourable circumstances. But his immense force, and the apprehensions

constantly entertained that in one of his fits of passion he would break down his apartment, insured for him the most indulgent treatment: nothing was required of him without a reward; and the little degree of motion which was allowed him was an additional reason for requiring from him no other actions than to open his mouth, turn his head to the right or left, hold up his leg, &c.

“This animal was brought from India to England, from whence he was transported to Paris in 1815. He was thicker and still more unwieldy in his proportions than the elephant, although less in general size. His height at the highest part of the back was five feet six inches, and his length nearly eight feet: his head measured two feet, including the ears. The whole body was covered with a thick tubercular and almost naked skin, with a number of deep folds almost too irregular to be described. It was of a deep violet grey colour which seemed almost black when oiled or greased; and this kind of lubrication was performed twice or thrice a-week to prevent the skin from drying and cracking. Beneath the folds the integument was of a flesh colour, and much softer than at the other parts. In certain places, as the outer side of the limbs, the knees, and on the head, the tubercles of the skin had acquired such a length as to resemble horny threads closely arranged in a parallel manner one against the other, and it is these papillæ which some authors have termed excrescences. The few hairs that are observable are chiefly situated on the tail and ears, and are stiff, thick, and smooth. The tail was habitually pendent, but was susceptible of voluntary movements to the right and left, and the animal made use of it to drive off from the skin whatever annoyed him.” Alluding to the organs of the senses, F. Cuvier observes, respecting that of touch, that it is confined to the upper lip, adding that all the other

senses appeared to be tolerably acute. "He frequently made use of that of smell, and preferred sugared fruits, and sugar itself, to every other aliment. He collected together the smaller morsels of food with his moveable upper lip to carry them to his mouth; and when he ate hay, he formed it with his upper lip into little bunches, which he afterwards introduced between his teeth by means of his tongue." Notwithstanding the occasional paroxysms of fury to which this rhinoceros was subject, his general docility and good temper impressed M. F. Cuvier with the idea of the capability of his being rendered perfectly tractable, and that such is possible we have sufficient testimony. The late Bishop Heber (while at Baroda) observes, "In passing through the city I saw two very fine hunting-tigers in silver chains; and a rhinoceros (the present of Lord Amherst to the Guicar), which is so tame as to be ridden by a miahout, quite as patiently as an elephant." Previously, however, he had seen tame rhinoceroses, and noted their tractable disposition:—"At Lucknow there were five or six large rhinoceroses, the first animals of the kind I ever saw, and of which I found that prints and drawings had given me a very imperfect conception. They are more bulky animals, and of a darker colour, than I had supposed, and the thickness of the folds of their impenetrable skin much surpasses all which I had expected. These at Lucknow are quiet and gentle animals, except that one of them has a feud with horses. They seem to propagate in captivity without reluctance; and, I should conceive, might be available to carry burdens as well as the elephant, except that, as their pace is still slower than his, their use could only be applicable to very great weights, and very gentle travelling. They have sometimes had howdahs on them, and were once

fastened in a carriage, but only as an experiment, which was never followed up."

The sluggishness of the rhinoceros, conjoined with his liability to sudden outbursts of rage, during which he would deal destruction around him, are circumstances which must ever militate against his being used as an ordinary beast of burden, even where he can be easily procured; for though more tractable than has been commonly imagined, his services would neither repay the expenses nor the risks attendant upon his keep.

We shall conclude our history of this species by presenting our readers with some details relative to the specimen now living in the menagerie of the Zoological Society of London, which may not be found altogether devoid of interest.

It was in the month of May, 1834, that the Zoological Society became possessed of the splendid Indian *rhinoceros* which may be regarded as one of the chief ornaments of their gardens, pre-eminently rich as they are in rare and valuable specimens. It was obtained by purchase from the captain of an East India vessel, for the sum, as we have mentioned, of 1000 guineas. The animal in question is a young male, between seven and eight years old, as it is asserted, and, of course, not yet arrived at its full dimensions. Its admeasurements, taken May 3rd, 1837, were as follow:—

Height at the centre of the back	ft.	in.
_____ withers	5	0
_____ haunches	5	2 $\frac{1}{4}$
Circumference of chest	5	3 $\frac{1}{4}$
_____ of middle of body	9	4
Length of head	11	2
From back of head to root of tail	3	1
Length of tail	8	6
Circumference of fore-foot	2	4
_____ of hind-foot	3	0
Length of ear	2	10
	1	0 $\frac{1}{2}$

On its first arrival at the Gardens, though in tolerable health, it was by no means in high condition, and was dull and languid, but did not appear to have suffered materially from the effects of its long voyage. When introduced into its new abode, it entered the den or apartment prepared for its reception with an air of quiet indifference, and seemed perfectly contented with its lot. Left to itself, it soon reposed its huge massive frame on the straw, and slept with great composure,—indeed the principal portion of every day was now passed in sleep, and it roused up only to take its food and satisfy its hunger. The food, however, was given in stated quantities and at due intervals, lest, after having been so long kept upon a spare diet, it should suffer from too sudden repletion. It was with this precaution in view that visitors were requested not to offer it any articles of food, as they do the elephants, the bears, and other animals.

In a short time the good effects of an unremitting system of care and judicious management were very evident: the animal began to improve—its health and strength returned, and it acquired, not only a marked increase of bulk, but a degree of liveliness scarcely to be expected in an animal of such a heavy and sluggish appearance. Its liveliness, it is true, did not display itself as in the light bounding deer or antelope, for the rhinoceros has pretensions neither to gracefulness nor activity, but in a manner very similar to what is exhibited by the hog, when, in the exuberance of his spirits, he runs with headlong precipitancy round the farm-yard, or the sty. Thus would the rhinoceros display his animation, and indulge in sudden fits of boisterous sportfulness; running round the den, ploughing up with his snout as he went the bed of straw which covered a great

portion of the floor, or striking with his horn (as yet short) the thick wooden lining of the walls.

The animal now also recognised its keeper, would rouse up at his voice, and playfully follow him as he passed backwards and forwards before the den, as if solicitous of food, or desirous of his notice. The diet consisted, as far as could be managed, of such articles as the animal had been accustomed to in India before it was taken on board—boiled rice and bran, carrots, lucerne, dried clover, hay, &c., being his staple food. Of water, which was given *ad libitum*, it drank large quantities. Water is indeed essential to the health of the rhinoceros, which, as we have said, in a state of nature, frequents the luxuriant borders of rivers or marshes.

As the summer advanced, and the days began to be warm, the animal was admitted, from time to time, into the *Elephant's Paddock* (as the railed plot of ground is termed in which the large bath is constructed), for the purpose of enjoying a plunge into the water, both a luxury to the animal, and essential to its health. Here he was perfectly at home; and it was a novel and interesting sight to watch his gambols. Now he would run to and fro, ploughing the mud with his snout; now he would plunge into the bath, run out, and again plunge in, where he would often long remain almost wholly immersed, enjoying the grateful refreshment of his congenial element. But on these occasions another delight was to roll and wallow in the mud, a habit common to the hog, the elephant, and indeed most of the *pachydermata*. Thick as the skins of these animals are, and of the rhinoceros in particular, they are nevertheless peculiarly sensitive. The annoyance of flies and other insects they feel acutely. Their skins (especially of the elephant, rhinoceros, &c.) are al-

most destitute of hair, which in most mammalia constitutes an effective protection. Hence may we conclude that it is in order to protect themselves from their hosts of puny tormentors that instinct has taught these animals to cover their hides with a layer of slimy mud. At all events it is a habit which the rhinoceros eminently displays, and which is most certainly attended with feelings of comfort and satisfaction. Basking in the sun with his huge frame lolling on the margin of his bath, where the clayey soil was trampled into mud by the elephant's feet and his own; now rolling his little eyes around, as if to take a survey of all about him; now closing them in tranquil slumber, he would present a picture of thorough epicurean enjoyment. To conduct the rhinoceros from his den to the paddock was a work of no difficulty, and he would quietly suffer himself to be driven along the railed-in road to it, but it was another affair to get him back again. He would not, in general, leave the water or his muddy resting-place without reluctance, and it would require no little management to get him into the passage to his apartment: not that he would offer any violent resistance, but he would avoid, as long as possible, all efforts to entrap him between the railings, and at last proceed reluctantly. The quietness of his temper is, however, not a little remarkable; hitherto he has exhibited no paroxysms of rage or fury, as the animal shown in Paris is reported to have done, but is inoffensive, happy, and contented. He neither pines nor evinces impatience in his captivity. To eat and drink and sleep, to roll in the mud, or luxuriate in his bath on a fine sunny day, constitute the sum total of his felicity.

We may here remark that the individual at Paris was confined in a narrow stall, which allowed him but a small degree of motion, from a fear lest he

should break through the bars of his prison. We can easily conceive how such cruel confinement, which barely allowed the creature the liberty of turning his head, would produce paroxysms of rage and impatience, and the most violent struggles for extrication from so irksome a condition. Nothing but an immediate and abundant supply of the food most agreeable to him pacified him in his fits of fury. In the present instance, the animal has a large apartment to himself, with a railed yard attached to it, so that he has plenty of room for exercise, and can scarcely be said to feel the irksomeness of confinement.

Of late, in consequence of some alterations in the paddock, the rhinoceros has been restricted to his own apartment and the inclosed space before it; and here he may be often seen, exhibiting in uncouth gambols an extraordinary spectacle of unwieldy strength exerted in the ebullitions of sportiveness. On one of these occasions, indeed, it managed, by repeated blows with its horn, to break some of the thick boards which line the walls of its den, and would have proceeded with its work of demolition if it had not been timely interrupted. On another occasion, in a fit of exuberant mirth, it put its keeper, who happened to be in the den at the time, into considerable jeopardy, and had nearly squeezed him to death in its unwieldy play. Thrusting at him with its horn, it followed up a regular attack, and at length fairly pinned him in a corner against the wall, driving its horn forcibly against his chest. From this perilous situation he was extricated by the other keepers, whom his calls for assistance led to the spot. It was some time, however, before he recovered from the effects of the bruises received in the unequal struggle.

The ordinary pace of this animal consists in a

slow, sluggish walk, but during its fits of animation its progress is rapid,—its pace being a heavy lumbering gallop, with the head carried low, so that the nose almost touches the ground. In a state of nature the rhinoceros thus rushes headlong upon its antagonist, striking an upward blow with its formidable weapon. Its play may, therefore, be regarded as a mimic representation of its mode of combat.

Our observations of the individual in the gardens of the Zoological Society confirm the accounts which travellers have given of the acuteness of its senses, and more particularly of those of hearing and of smell. The ears are very moveable, and the animal may be observed turning them almost constantly in different directions, as if intent to catch the various sounds around him. Though visitors are not permitted to feed him, he scents the buns or bread they may have in their hands for the supply of the elephant, and will approach the bars to solicit a share, which he does very expressively, gazing intently at them, and at the same time stretching out the upper lip, which is capable of being protruded to a remarkable distance, so as to form a sort of proboscis. While the keeper bringing his meal to him is yet at a distance, he is instantly aware of his approach, and testifies unequivocal signs of satisfaction. His voice is a short inward grunt, uttered occasionally, and especially when about to feed or take his rest. In his moments of excitement, however, he frequently utters a neighing sort of sound, which though not very loud is shrill and piercing.

We have alluded to the power of protrusion possessed by the upper lip of this animal, which constitutes it a rudimentary proboscis. In the elephant the development of the upper lip into a proboscis is

carried to its highest degree of perfection, but we are not to suppose that this structural peculiarity is exclusively limited to the elephant, for we recognise it in the tapirs, both of the Old and New World. In these animals the proboscis is short: still, however, they are capable of twining it round branches, or of holding objects in its grasp, and they use it in the procuring of their food. In the rhinoceros the development of the upper lip into a proboscis is far inferior to what we see in the tapir, yet, as we have often witnessed in the animal at the Gardens, it can hold objects with it, it can secure carrots and other things in its grasp, and direct them into the mouth, or double it round small bundles of hay or straw. When the creature begs for food between the bars of its stall, it may be observed to protrude its upper lip into a long, pointed, conical figure, and with this, doubling it round the object, it grasps whatever is offered for its reception. This, however, is an experiment visitors are not allowed to make, lest an indiscriminate supply of food should injure its health and appetite.

While alluding to the proboscis of the elephant, tapir, and rhinoceros, we may observe that something of this mobility of the upper lip is seen in the horse also, which uses this organ in gathering up his hay; but its power of protrusion and of grasping is inferior to what is possessed by the lip of the rhinoceros.

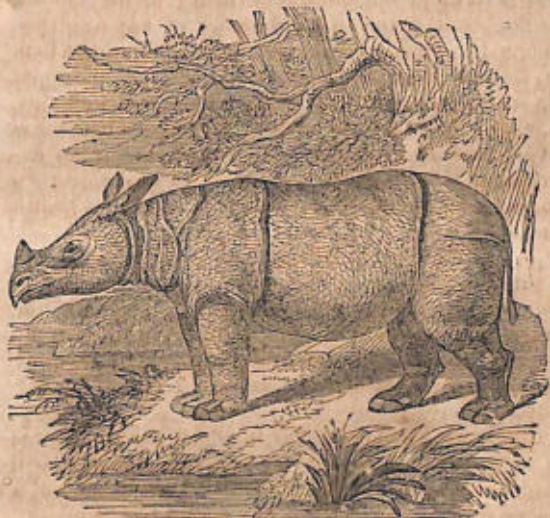
From the good condition in which the rhinoceros is at present, there is every probability that it will continue for many years a source of attraction and a theme of admiration in the Zoological Gardens.

We shall conclude by giving the following account of the daily *diet* of the animal as at present regulated:—

Clover-hay	lbs.
Meadow-hay	28
Rice	28
Potatoes	8
Bran, three pecks	5
Salt	$\frac{3}{4}$

The salt is mixed with the boiled rice and bran.

Such is each day's consumption of solid food. Of water he takes daily fourteen gallons. He is generally lively in the afternoon and evening, and passes fourteen hours on the average out of the twenty-four in sleep and repose.



Rhinoceros of Java.—*Rhinoceros Sundaicus*, Cuv.: *Rh. Javanicus*, P. Cuv.
(From a plate in Dr. Horsfield's *Zoological Researches in Java*.)

The rhinoceros of Java was first suspected by Camper to be specifically distinct from the common

Indian rhinoceros, and the suspicions of Camper were subsequently converted into certainty by Baron Cuvier, from a rigid comparison of the entire skeletons of the two animals, and an examination of the skin, conjoined with a description of the living animal by MM. Diard and Duvaucel.

As far as is yet known, this species is limited to the island of Java, where it is termed warak: in the possession of incisor teeth, a single horn, and a folded skin, it agrees with the Indian rhinoceros, but differs from that animal in the character and situation of the folds, and in general inferiority of size. Its proportions are less massive, and its limbs longer in proportion, than in the *Rh. Indicus*, and the disposition of the folds of the skin is different. On the head they are wanting, the cuticle being rugous, and divided into small angular plates, as it is also on the body. A fold crosses the occiput, and a second stretching transversely across the shoulders extends on either side beneath the throat; a third fold behind the shoulders almost encircles the body, a transverse fold exists above each fore-leg, a large fold crosses the crupper and descends on each side in front of the thighs, and a slight fold beginning at the root of the tail advances forwards upon each thigh.

These folds are all less deep than in the Indian species; the surface of the skin is divided into small polygonous tubercles, with a slight central depression in each, from which arise a few short bristly hairs; the ears are bordered with a series of long, stiff, and closely-arranged bristles, and a similar series of bristles extends along the under surface of the tail.

It is to Dr. Horsfield that we owe whatever knowledge we possess of the habits of the Javanese rhinoceros. Referring to the figure given of the animal in his 'Zool. Researches in Java,' this

clever naturalist states that the individual from which the drawing was taken was captured while very young in the forests of the province of Kédá, and was conveyed to the residency at Magellan in the year 1815 or 1816: "by kind treatment it soon became domesticated to such a degree, that it permitted itself to be carried in a large vehicle, resembling a cart, to the capital of Suracarta. I saw it during its conveyance, and found it perfectly mild and tractable. At Suracarta it was confined in the large area or square which bounds the entrance to the royal residence. A deep ditch about three feet wide limited its range, and for several years it never attempted to pass it. It was perfectly reconciled to its confinement, and never exhibited any symptoms of uneasiness or rage, although on its first arrival harassed in various ways by a large proportion of the inhabitants of a populous capital, whose curiosity induced them to inspect the stranger of the forest. Branches of trees, shrubs, and various twining plants were abundantly provided for its food: of these the species of *Cissus*, and the small twigs of a native fig-tree, were preferred. But plantains were the most favourite food; and the abundant manner in which it was supplied with these by the numerous visitors tended greatly to make the animal mild and sociable. It allowed itself to be handled and examined freely, and the more daring of the visitors sometimes mounted on its back. It required copious supplies of water, and, when not taking food or intentionally roused by the natives, it generally placed itself in the large excavations which its movements soon caused in the soft earth that covered the allotted space. The animal rapidly increased in size: in the year 1817, having been confined at Suracarta about nine or ten months, the dimensions were nine feet in length, and above four feet three inches in height

at the rump. In 1821 it had acquired the height of five feet seven inches.

“This information I received from my friend Mr. Stavers, who is now in England on a visit from the interior of Java; and he favoured me further with the following detail, which completes the history of the individual.

“Having considerably increased in size, the ditch of three feet in breadth was insufficient for confining it; but, leaving the enclosure, it frequently passed to the dwellings of the natives, destroying the plantations of fruit-trees and culinary vegetables which always surround them. It likewise terrified those natives that accidentally met with it, and who were unacquainted with its appearance and habits. But it showed no ill-natured disposition, and readily allowed itself to be driven back to the enclosure like a buffalo. The excessive excavations which it made by continually wallowing in the mire, and the accumulation of putrefying vegetable matter, in the process of time became offensive at the entrance of the palace, and its removal was ordered by the Emperor to a small village near the confines of the capital, where, in the year 1821, it was accidentally drowned in a rivulet.

“The rhinoceros lives *gregarious* in many parts of Java. It is not limited to a peculiar region or climate, but its range extends from the level of the ocean to the summit of mountains of considerable elevation. I noticed it at Tangung near the confines of the Southern Ocean, in the districts of the native princes, and on the summit of the high peaks of the Priangan Regencies; but it prefers high situations. It is not generally distributed, but is tolerably numerous in circumscribed spots distant from the dwellings of man, and covered with a profuse vegetation. On the whole, it is more abundant in

the western than on the eastern districts of the island. Its retreats are discovered by deeply excavated passages which it forms along the declivities of mountains and hills. I found these occasionally of great depth and extent. In its manners the rhinoceros of Java is comparatively mild. It is not unfrequently met in the wilds by Europeans and natives. No instance of its showing a disposition to make an attack has come to my knowledge: being the largest animal in Java, its passions are not roused, as in many parts of India, by contentions with the elephant. It is rarely seen in a domestic state, but is occasionally decoyed into pits and destroyed. Our animal rambles chiefly at night, and often occasions serious injury to the plantations of coffee and pepper which are laid out in the fertile districts selected for its retreats. The horns and skin are employed for medicinal purposes by the natives."

The rhinoceros of Java was known to Bontius, who wrote on the productions of that island in 1629. He falls, however, into the common error respecting the extreme roughness of the tongue. When exasperated, he says, "it will toss up a man and horse like a fly, whom it will kill by licking, while, by the roughness of its tongue, it lays bare the bones." Assertions such as this, which abound in the writings of the naturalists of the last two centuries, lead us to mistrust them throughout all their details.

Our third species of rhinoceros (*Rhinoceros Sumatranus*, Raffl. ; *Rh. Sumatrensis*, Cuv.) is peculiar to the island of Sumatra, and was first definitely indicated by Charles Millar, (long resident at Sumatra,) in Pennant's Natural History; subsequently it was accurately described and figured by Dr. Bell in the Philosophical Transactions for 1793. The existence, however, of a rhinoceros in Sumatra was noticed by Marco Polo, who, speaking of this island,

says, "In this country are many wild elephants and rhinoceroses, which latter are much inferior in size to the elephant, but their feet are similar. Their hide resembles that of a buffalo. In the middle of the forehead they have a *single horn*; but with this weapon they do not injure those whom they attack, employing only for this purpose their tongue, which is armed with long sharp spines, and their knees or feet; their mode of assault being to trample upon the person, and then to lacerate him with the tongue. Their head is like that of a wild boar, and they carry it low towards the ground. They take delight in muddy pools, and are filthy in their habits." He adds that "they are very shy animals, and not to be decoyed by females, like the elephants."

It is evident from one great error that Marco Polo never saw the species in question; inasmuch as he attributes to it a *single horn*, whereas the horn is double. The account of the use made of the tongue as a weapon is founded on mere hearsay statement, commonly current when Marco Polo wrote. The only part of the description at all correct is that of the resemblance of the hide of the animal to that of a buffalo; but this seems merely accidental.

The Sumatran rhinoceros (*Rhinoceros Sumatranus*, Raffles), or "Badak"* of the Malays, is intermediate in form between the Asiatic and the African species. With the former it agrees in dentition, with the latter in the number of the horns; whilst the skin, almost destitute of folds, is much softer and more hairy than in the Indian or Javanese animals. The figure of the animal already alluded to in the Philosophical Transactions is very correct; but that of the skull is erroneous in one particular. The intermaxillary

* The Malay word "Badak" is evidently the origin of the terms Abadia and Abath applied to the rhinoceros of India by the early voyagers.

bone of the upper jaw is straight and horizontal, and not curved as there represented; and the incisor teeth, instead of being two, are really four, in each jaw, as in the *Rhinoceros Indicus*: but of these incisors, two in each jaw are very small, and soon fall out, and were therefore, it is most probable, wanting in the skull from which Dr. Bell took his drawing.

"The skin of the Sumatran rhinoceros," says Sir T. S. Raffles, "is much softer and more flexible than that of the Indian one, and is not, like it, corrugated into plates of mail. It has however some doublings or folds, particularly round the neck, shoulders and haunches, rather more defined and distinct than in Dr. Bell's drawing. The natives assert that a third horn is sometimes met with, and in one of the young specimens procured an indication of the kind was observed. The female has a larger and heavier head than the male, but is similar in other respects. They are not bold, and one of the largest size has been seen to run away from a single wild dog.

"The one-horned rhinoceros is not known to the natives of this part of Sumatra; and the single horns, which are occasionally procured, appear to be merely the larger horns of the two-horned species separated from the small one. There is however another animal in the forests of Sumatra never yet noticed, which in size and character nearly resembles the rhinoceros, and which is said to have a single horn. This animal is distinguished by having a narrow whitish belt encircling the body, and is known to the natives of the interior by the name of tennu." It has been seen at several places, and the descriptions given of it by people quite unconnected with each other coincide so nearly, that no doubt can be entertained of the existence of such an animal. It is said to

resemble in some particulars the buffalo, and in others the badak or rhinoceros."....."It should be remarked that the native name tennu has until lately been understood to belong to the tapir. It is so applied at Malacca, and by some of the people at Bencoolen. In the interior, however, where the animals are best known, the white banded Rhinoceros is called tennu, and the tapir gindol, and by some babi alu. It is not impossible that, as both animals have white bands, the names may have been confounded by people little in the habit of seeing either, and deriving their information solely from report. In a country like Sumatra, where the inhabitants, in a great measure shut out from general communication, are divided into an infinity of tribes, speaking different dialects, a perfect consistency or uniformity of nomenclature cannot be expected, and it is not always easy to reconcile the synonymy." *Vide* Trans. Soc. Linn., vol. xiii.

The above account serves to prove that we have yet much to learn respecting the natural productions of this island, and of the larger islands of the Indian Archipelago; they present to the spirit of enterprise a wide field, rich in materials; but a thousand obstacles render the acquisition of these materials a work of time and labour. The tennu of the forests of Sumatra, however, we cannot help regarding as the tapir, notwithstanding the assertion of the natives that it possesses a horn: at the same time it is possible that the animal referred to in the above passage may be new, if indeed the accounts of the natives are worthy of credit, and thus prove a link in the chain of the *pachydermata*, elucidating points of great interest to the student of nature. But, until Sir T. S. Raffles obtained a vague account of it, Europeans had never previously dreamed of its existence: yet Europeans had resided in Sumatra long

before that eminent and excellent man, in whom the spirit of inquiry and enterprise was never dormant. Did all, with opportunities in their power, make use of those opportunities (whether limited or extensive) by adding to the stock of general information, how much would the progress of knowledge be accelerated!

Let us now pass to Africa, and examine into the habits, manners, and forms of the species inhabiting this vast portion of the globe, the interior of which is yet a *terra-incognita*, a region into which the most unsuccessful endeavours to penetrate have been productive of information. When we say therefore that three species of rhinoceros are indigenous in Africa, we do not assert that no other species exist there, but that we are only acquainted at present with this number; and indeed of these one is a very recent acquisition to science. Which of the three species is really the most abundant cannot easily be determined until we know much more of the interior than we do at present; but the species denominated *Rhinoceros bicornis*, Linn., *Rhinoceros Africanus*, Cuv., is that of which, through the writings of travellers, we have the fullest accounts, and which they themselves have most frequently met with.

The rhinoceroses of Africa have two nasal appendages, and the skin, though dense and coarse, is utterly destitute of folds: it is not however in these respects alone that the African and Indian species (setting aside the Sumatran species) differ, but also in the character of the dentition, a point of great importance.

The *molars* amount to twenty-eight in number, and there are no *incisors*, nor indeed is there any place for them, at the anterior part of the jaws. The intermaxillary bone is too small to contain them;

and in the lower jaw the space which they occupy in the Indian species is far too much encroached on by the molars for the possibility of their presence: in fact, the molars occupy nearly all the extent of the lower jaw, from the back part to the apex.



Common African Rhinoceros.—(From a specimen in the British Museum.)

The common African rhinoceros, *Rh. Africanus*, Cuv., possesses an extensive range of habitat, being spread over the whole of the southern regions of the continent of Africa, and extending, if the species be truly identical, into the central districts also. Huge, heavy, and massive in all its proportions, it prefers, like its Indian congener, the borders of marshes, lakes, or rivers, and delights to wallow in the mire. Its skin, destitute of folds, is

very thick, naked, and scabrous, and of an ashy brown; a few bristly hairs are seated along the edges of the ears and about the base of the horns. The height of a full-grown animal is from seven to eight feet, the length being from twelve to fourteen.

Of the senses of this animal those of hearing and smell are very acute, but that of sight seems, according to the general accounts of travellers, to be rather defective, more we suspect from the bulk of the body screening objects not immediately before him, than from any inferiority in the visual powers of the eyes themselves. It is true, indeed, that the rhinoceros, if circumstances prevent the animal from becoming aware by means of smell or hearing of the presence of the hunter, may be very closely approached, and that when attacked it rushes impetuously onwards, as if in either case it did not perceive its enemy. But, granting this, nothing is deduced from it excepting the caution of the hunter, and the difficulty the clumsy beast experiences in making a sudden turn in the midst of a headlong career, to which pain or fear instantaneously excite him. We know, however, that the rhinoceros can follow his object with great certainty, and that it requires much coolness and activity to avoid his charge. Burchell observes, respecting these animals, that "their smell is so keen and nice, that they know even at a great distance whether any man be coming towards them, and on the first suspicion of this take to flight. Therefore it is only by approaching them against the wind or from the leeward that the hunter can ever expect to get within musket-shot. Yet in doing this he must move silently and cautiously, so as not to make the least noise in the bushes as he passes through them, otherwise, their hearing is so exceedingly quick, that they would instantly take alarm and move far away to some

more undisturbed spot." To this he adds (proving that their sight is not *really* defective), "But the dangerous part of the business is, that when they are thus disturbed they sometimes become furious, and take it into their head to pursue their enemy; and then, if they once get sight of the hunter, it is impossible for him to escape, unless he possess a degree of coolness and presence of mind which in such a case is not always to be found. Yet, if he will wait quietly till the enraged animal make a run at him, and then spring suddenly on one side to let it pass, he may gain time enough for re-loading his gun before the rhinoceros gets sight of him again, which it fortunately does slowly and with difficulty."

Making allowance for the less degree of elevation presented by the occiput, the less depth of the concavity above the eyes, and the existence of two instead of a single nasal horn, the general description of the head of the Indian species will apply to this also; the position and smallness of the eyes, and the flexibility and power of protrusion enjoyed by the upper lip, are the same, and the tongue is also smooth. The nasal or apparently nasal situation of the eyes is noticed by Barrow. He says, "Not only the horns sit upon the nose, but the eyes are also placed in it, being directly under the root of the larger horn, and they are so minute that one would suppose them of little use to so large a creature. But nature, always provident, has remedied this inconvenience by placing them in projecting sockets, in which they turn in all directions like those of the little cameleon;" and he rightly concludes that a larger scope of vision is secured by their projection and forward situation than would otherwise have been enjoyed.

The Swedish traveller, Sparrman, one of the earliest and best of the writers on the productions of

South Africa, gives us some interesting details respecting this animal, the first specimens of which he procured between Boshman's river and Quamme-dacka, when a Hottentot in attendance shot two of them, each with a single ball that penetrated into the lungs. The smallest of these animals was seven feet high, eleven feet and a half long, and twelve feet in the girth. Its hide had, he observes, none of those plates and folds which we find in *drawings* and *descriptions* of the *Rhinoceros bicornis*, and which give it the appearance of being clad in armour; but it was an inch and a half thick, and still thicker, though less compact, on the sides. The surface of it was scabrous and knotty, and not much differing from that of the elephant, but of a closer texture, and extremely hard when dry. It was ash-coloured, excepting about the groin, where it was a great deal thinner, quite smooth and flesh-coloured.

In reference to the horns—the shape, relative size, and situation of which, together with their fibrous texture, Sparrman describes with great exactness—he promulgates a singular error, an error arising not from any oversight committed by himself, but from too implicit a trust in the assertions of the Hottentots. The first horn, as he rightly states, is always larger than the hinder one, which, especially in old rhinoceroses, is commonly much worn away. This latter circumstance he thinks goes to confirm the assertion of the Hottentots and colonists, that the animal uses his shorter horn only for digging up the roots which constitute its chief food, being endowed with the power of turning the larger horn aside out of the way. He was also informed, by the same authorities, that in the living animal the horns were so freely moveable, and indeed so loose, that as it walked carelessly along its horns might be seen to rock about,

and heard to clash and rattle against each other.* A moment's consideration will suffice to show the utter fallacy of such statements: the horns, arising by a spreading base from the hard skin, may be said to be rooted in the bony structure, for the irregularities and depressions of the part below their base are such as to secure their firmest attachment; they are governed by no muscles—why should they be? nay, it is very plain that they cannot be: then how, even supposing that they were not so firmly attached to the bone as they really are, can they be moved about at pleasure? If Sparrman had tried, he would have found them firm as a rock. We have spoken with those who for years have been in the habit of seeing and hunting the rhinoceroses of South Africa, and we have made particular inquiries on this very point, with a view to test our own opinions by the practical observations of men well conversant with natural history, and close scrutinisers of the habits of animals in their native wilds: the reply has been, "The whole is a fable; the horns of the rhinoceros are fixed and firm." Of the power with which these weapons are wielded by their gigantic possessor, the following account by Bruce will convey a lively idea: "Besides the trees capable of most resistance, there are in the vast forests within the rains trees of a softer consistence, and of a very succulent quality, which seem to be destined for his principal food. For the purpose of gaining the higher branches of these, his upper lip is capable of being lengthened out, so as to increase his power of laying hold with this, in the same manner as the elephant does with his trunk. With this lip, and the assistance of his tongue, he pulls down the upper branches, which have most leaves, and these he devours first. Having stripped

* Some modern travellers have made similar assertions.

the tree of its branches, he does not therefore abandon it, but placing his snout as low in the trunk as he finds his horns will enter, he rips up the botly of the tree, and reduces it to so many thin pieces, like so many laths; and when he has thus prepared it he embraces as much of it as he can in his monstrous jaws, and twists it round with as much ease as an ox would do a root of celery, or any such potherb or garden-stuff." There is no doubt some degree of exaggeration in this description; but the violence with which the rhinoceros strikes with his horns the hardest bodies, or ploughs up the ground, throwing the clods and stones about him as he rushes along, is a sufficient evidence of their being fixed and solid. It is remarkable, however, that Salt, when travelling in Abyssinia, was assured of the mobility of the horns by several natives who had seen the animal alive. One of the Africans said that, "When feeding in the fields undisturbed, the horns are often depressed (which he showed with his hand on his head inclined in an angle of about 45°); but when alarmed (raising his hand to a perpendicular over his head) the animal erects them thus." It is to be observed, however, that Mr. Salt never saw the rhinoceros alive himself, but he procured several sets of the horns, *which were fastened together by a portion of the skin, having no connexion whatever with the bone of the head.* We have already stated that the horns are secretions from the skin, and that they do not arise immediately from the skull; consequently they may be detached from the skull along with the skin by dint of force, but this is no argument in favour of the animal having the power of raising or depressing them at will, as has been too hastily presumed. To return to Sparrman. Referring to the two individuals killed, he states the shape of the horns to be

conical, with the tips inclining backwards, and notices their texture as consisting of parallel horny fibres; in their lower part they are rough and full of inequalities, but in the upper part they are plain and smooth, like those of oxen.

The anterior horn of the smaller of the two animals was a foot long and five inches in diameter at the base. The same horn on the larger animal was eighteen inches long and seven inches in diameter at the base. The feet do not project much in any part beyond the thick legs, and (as he correctly observes) they are divided into three hoofs, the central of which is the largest and most rounded. The soles of the feet, as in the elephant, are covered with a thicker and more callous skin than the other parts, and are somewhat of a circular form.

Mr. Sparrman chose the smaller of the two animals for dissection, an operation which, on account of the enormous weight of the beast and the toughness of its hide, was not performed without difficulty, and then only imperfectly. Taking the unwieldy beast as it lay, his assistants began their operations upon its left side, and removed a large slip of its thick skin, in doing which they were repeatedly obliged to sharpen their knives. They broke through the ribs with an axe, and by hacking and tearing contrived to empty the cavity of the abdomen. The naturalist made drawings, and took the necessary admeasurements of various parts, after which the diaphragm was removed, and then "a naked Hottentot crept into the carcase in order to pluck out the lungs and heart." Mr. Sparrman, from this rude and hasty examination, satisfied himself of the general resemblance between the visceral anatomy of the *Rhinoceros bicornis* and that of the horse: in both animals the gall-bladder is wanting (as it is in many others of the pachydermatous order, the tapir, hyrax, &c.).

The tongue, instead of being rough and spiny, as asserted by Pliny, Marco Polo, and others, is perfectly soft and smooth. There are no incisor teeth, the pointed form and extreme hardness of the lips enabling the animal to clip the tops of plants and shrubs, however rough and prickly; for of such, with roots, small branches, and succulent plants, the stomach of the individual examined was filled.

The hide of the African species of rhinoceros, though thick and dense, is not thrown into heavy solid shields, as in the common Indian species, and would appear to be much more easily pierced; to this fact Sparrman adverts, and at the same time combats the notion, set forth by various writers on natural history, of its insensibility. He observes also that from the small size and position of its eyes the animal sees only straight forwards; "but to make up for this deficiency of sight its organs of smelling and hearing are so much the more acute: therefore at the least noise the creature takes the alarm, and, pricking up its ears, stands clapping with them and listening."

On returning on the 6th of February to the spot where the two rhinoceroses had been shot on the 19th of December preceding, Sparrman found that the greater part of these large animals had been eaten up or carried off by wild beasts and birds. The skulls were in good preservation, and, having taken possession of one of these, the naturalist and his companions were about returning to their waggon, when a female rhinoceros with her calf crossed their path. This calf was about the size of a small ox, but its horns were very small, and it seemed timidly to depend on the mother, whom it followed in all her motions. The noise of their horses betrayed them to the quick-eared animals, that stood still, list-

ening and moving about their ears, close to the entrance of a narrow hollow, through which they must pass to gain their waggon. In this dilemma Sparrman fired his gun, which was loaded with a ball made of lead and tin, but too small for the sport. It moreover hung fire for some time, and he only hit the mother on the lower jaw. On receiving the wound the animal swung about a little with the fore-part of her body, and snuffed up her nostrils, as if to scent her enemies. But they were to the leeward of her. She then, closely followed by her calf, moved forward with a slow and measured pace, as if to search a bush that lay between her and her assailants. The party, according to Sparrman's honest confession, were in a fright. A Hottentot, however, boldly kept his ground until the huge rhinoceros was close upon him, when he fired. The animals did not turn back, but ran forward with great impetuosity, and passed the travellers, apparently without seeing them. They did not, however, seem disposed to retreat from the field, for very shortly after Sparrman found them again facing him. "Indeed," says he, "I happened to discover them much sooner than I expected; and at the same time found they were nearer sighted than I could have ever supposed, as they stood about eighty or ninety paces from me on the open plain, without appearing to perceive either me or my horse, although they stood listening with their heads turned towards the place from which I advanced towards them." "After this," he continues, "dismounting from my horse, and walking on till I got within fifty or sixty paces of them, without anything to cover my approach, I fired at the old animal, which even now did not observe me, but, merely swinging the fore-part of her body from one side to the other with great impe-

tuosity, and at the same time blowing so hard and loud, that our horses, left to the care of an Hottentot, at several hundred paces off, were not a little terrified. After this, the two wild beasts ran away through the bushes, where it was both hazardous and difficult to pursue them. The Hottentots, who were better acquainted with this kind of chase, afterwards told us that it would have been much better for us had we fired at the calf, on which the small ball would have proved more effectual; in which case they supposed that the mother would have remained with the dead body till the next day, when they might have gone there and shot her also. In like manner they imagined that the calf would have remained with the body of the mother, in case she had been first killed."

When Sparrman reached his waggon he found that one of his Hottentot huntsmen, who had been in a different direction, had seen and wounded, but not *killed*, another rhinoceros that day. The breed, however, could not have been numerous in that part of Africa, even in his time, as Sparrman only saw eight rhinoceroses during all his journey. He gives a very amusing account of a hunt after one of these which passed within fifty paces of his waggon. His dogs boldly gave chase, and for some time were able to keep close to his heels, the pursuers contrasting singularly in size with the pursued, while the colossal animal on his part did not seem to take the smallest notice of them, but, with a trifling rise and fall of the neck, kept on an even and steady course, until he heard the report of fire-arms behind him, when he went off at a rapid pace.

In 1802 Lichtenstein found numbers of rhinoceroses near the Great Fish River and the coast, in a country overgrown with succulent plants. He was

informed that the animal was very dangerous to the traveller by night, when it rushes forward with blind fury at every noise of which it is informed by its acute hearing, and at every object betrayed to it by its more acute sense of smell. Examples were known of their having run in the dark against a waggon (in which vehicle, travellers in the interior of the Cape, where there are no habitations, pass the night), and not merely overturned it, but trampled it to pieces, and killed the oxen attached to it. As he descended this river towards its mouth, he found the country cleared of them and other large game, as a very grand hunting-match had recently been held there by a number of Dutch boors, who had coasted the stream almost down to the sea, and in going and coming, in twenty days, had killed five hippopotami, eight rhinoceroses, nine hartebeests, two wild boars, and five wild goats!

Continuing his journey, however, along the same river, the Doctor met a large rhinoceros, which was frightened away by the sight of his large party and by the cracking of the waggoners' immense whips. Some hunters pursued it, but in vain. It ran with great swiftness, breaking down the bushes and underwood that opposed its progress with the greatest facility, and making way for itself where it was impossible for them or their horses to follow. This intelligent traveller agrees with Sparrman that the sight of the rhinoceros is defective, and that, with a little agility, its furious but stupid attack may be easily avoided. "The huge animal," he says, "always rushes straight forward, bending his head, closing his eyes, and pushing his horn along the ground. It is then easy to escape him, by stepping nimbly out of his way and letting him run onward; but attention should be paid to keep to the side

against the wind, so that he may not catch the scent. I have seen rhinoceros-hunters who have assured me that they have contended in this way with one of the monsters for four hours together, till his rage was at last quite spent, and he was easily killed."

The commonest mode here, however, of killing rhinoceroses, was to watch them on a moonlight night to the spots where they went down to the river to drink, and there lie concealed among rocks or bushes until they came close to the muzzles of the guns. The part aimed at was about the eye.

In Burchell's travels, so valuable to the naturalist, as containing details of the habits of many interesting animals indigenous in the southern regions of Africa, we meet with a variety of facts relative to the rhinoceros, an abstract of which will not, we trust, be out of place or unacceptable. With regard to the senses of the rhinoceros, of which, as we have stated, those of smell and hearing are the most developed, a colonial Hottentot, named Speelman, well acquainted with the habits of the animal, confirmed the general observations of travellers. He stated as follows:—"Their smell is so keen and nice, that they know even at a great distance whether any man be coming towards them; and on the first suspicion of this take to flight. Therefore it is only by approaching them against the wind that the hunter can ever expect to get within musket-shot. Yet in doing this he must move silently and cautiously, so as not to make the least noise in the bushes as he passes through them; otherwise, their hearing is so exceedingly quick, that they would instantly take alarm, and move far away to some undisturbed spot." On one occasion Speelman, the above-mentioned Hottentot, happened to kill two rhinoceroses, of which one fell and remained in a position which

enabled Mr. Burchell to take accurate drawings of it. It sank in dying on its knees, and maintained "nearly the same attitude as when alive." "The first view of this beast," says Mr. Burchell, "suggested the idea of an enormous hog, to which, besides in its general form, it bears some outward resemblance in the shape of its skull, the smallness of its eyes, and the proportionate size of its ears; but in its shapeless, clumsy legs it more resembles the hippopotamus and elephant."

"The length of this animal was as follows:—Over the forehead, and along the back, from the extremity of the nose to the insertion of the tail, was eleven feet and two inches, but in a direct line not more than nine feet three inches. The tail, which at its extremity was complanated or flattened, vertically measured twenty inches; and the circumference of the largest parts eight feet and four inches." In this specimen, most probably young, there were on each side above five large molars and a small posterior one, making six; but in the lower jaw there were on each side six larger grinders and a small one at the back, making seven.

The flesh of the rhinoceros is by no means despicable as food. Sparrman observes that its flavour when broiled is not much unlike that of pork, in which he is supported by Bruce, who states that "the most delicate part about him is supposed to be the soles of his feet, which are soft, like those of a camel, and of a gristly substance. The rest of the flesh seems to resemble that of the hog, but much coarser." Mr. Burchell however says that its flesh is like beef. "The meat of the rhinoceros was excellent, and had much of the taste of beef;" that of an old one, however, he adds, "was somewhat tough, perhaps on account of having been just killed." A female, which was slain, "being fatter,

proved exceedingly well-tasted and wholesome. The tongue would have been pronounced a dainty treat even by an epicure."

From the same authority we learn that the Hottentot hunters adopt an ingenious mode of escaping from the attacks of this impetuous animal. They carry a sort of umbrella, made of ostrich-plumes, and this, when hard pressed and in imminent danger, they stick into the ground, and leave it to the fury of the enraged beast, which, imagining that its enemy is planted before it, makes the feather-stick (as it is called) the object of attack; the hunter in the mean time being enabled to effect his escape, or gain time for a second attempt.

We know not whether the African rhinoceros can be rendered as tame as its Indian relative, but we cannot doubt but that much may be accomplished, notwithstanding the furious temper and stupidity of the animal; not, however, by starvation and close confinement, but by a system of indulgence, mingled with a moderate degree of restraint, especially at first, so as to be as little irksome as may be. The indocility and want of intelligence which are said to be so characteristic of the animal are we suspect much overrated. It is true that the brain is small in proportion to the bulk of the body, being in volume truly stated "to be but one-third of that which usually belongs to an individual of the human species" (see Brewster's *Encycl.*, Art. *Mazology*), but so is that of the hog, the ox, the horse, and yet these animals are not indocile, nor is the hog, notwithstanding all that has been said, destitute of intelligence. It is astonishing how old errors pass from generation to generation, and how difficult it is to suppress them. The hyæna, for example, was but lately believed to be utterly untameable, and is so still by many, whereas nothing can be farther from the

truth: the rhinoceros has been regarded as utterly irreclaimable: we have seen, however, that the Indian species may be rendered tame and taught to carry burdens, and until the trial be fairly made, and found to fail, we have no reason to believe that the African animal is more indomitable. "A steady uniform fierceness in the brute creation," says Bruce, "is to be subdued by care and by hunger; this is not the case with the rhinoceros; his violent transports of fury upon being hungry, or not being served in the instant with food, seem to bar this manner of taming him. His revenge and fury are directed as much against himself as against an enemy; he knocks his head against the wall or the manger with a seeming intention to destroy himself." This blind fury is at least as characteristic of the Indian as the African species. Our readers will remember the fate of the individual sent by Emmanuel, king of Portugal, to the Pope, and also F. Cuvier's account of the paroxysms of frenzy to which the individual in the menagerie at Paris was subject: yet we know that this animal may be rendered quiet with comparative facility, as Bishop Heber testifies, and indeed as is proved by the specimen now living in the gardens of the Zoological Society of London.

Bruce gives many details concerning the rhinoceros in Abyssinia, but his figure of the animal is to all appearance that of the Indian species apparently copied from Buffon, to which is added a second horn on the nose; a circumstance which, notwithstanding all that he says, would lead us to suspect that he never saw, or at least closely saw, the animal. He states indeed, in the Appendix to his Travels, that the drawing which he made of the double-horned rhinoceros was the first that had been presented to the public, and that he had opportunities of seeing the animal in its native woods: if his drawing be faith-

ful, we have yet to become acquainted with the species, for it is not, as Salt affirms, identical with the *Rhinoceros bicornis* of South Africa. However this may be, we must leave to be determined hereafter.

Bruce regards the rhinoceros as identical with the reem of Scripture, a point to which we have previously adverted. He observes also, that though, considering his size and unwieldiness, the rhinoceros is rapid in his motions, it is not true that he is swifter than the horse, and that he has himself many times passed him with ease on horseback. Indeed the animal does not trust to speed for safety, but at once makes for the woods and thickets.

Among the natural tormentors of the rhinoceros, the flies are most annoying, and to him the most formidable: it would appear, however, fortunately for the animal, that they swarm only during the rainy seasons, when the soft parts of the earth in low situations become miry. The rhinoceros has then the opportunity of getting rid of his enemy. "In the night, when the fly is at rest, he chooses a convenient place, and, there rolling himself in the mud, he clothes himself with a kind of case which defends him against his adversary till the following day." As with the Indian species, rolling in the mire is not only a means of defence against the attacks of insects, but in itself a real luxury. While taking his mud-bath, Bruce says that "he grunts and groans so loud, that he is heard at a considerable distance," and that the enjoyment, combined with the darkness of the night, deprives him of his usual vigilance, so that the hunters, guided by the noise, steal secretly upon him. The Shangalla kill him with arrows, and these "the worst and most artificial that were ever used by any people practising that weapon."

The rhinoceros is hunted for the sake of its skin

and horns, which are valuable articles of trade throughout the country, Arabia, and indeed the East in general. The skins are made into shields, whips, &c., the horns into handles for swords and daggers.

The Abyssinians, who are familiar with the animal's stupid and unvaried mode of charging, and who are excellent horsemen, attack the rhinoceros on horseback and on an open plain without fear. As the rhinoceros rushes forward after the manner of the wild boar, the horse, which is well trained and in hand, is easily made to turn short aside and avoid the shock; on the instant a naked man drops from behind the hunter on the saddle, and, unperceived by the beast, which turns with difficulty, cuts at a blow with a sharp sword the tendon of the heel, so as to render the poor animal incapable of flight. The natives near the internal African lake, the great Tchad, are said to hunt the rhinoceros, which, as well as the hippopotamus, abounds in that district, in a still more fearless manner, following the animal on horseback into the swamps near the lake, much as they do the wild buffaloes.

The following is an account by Bruce of a rhinoceros-hunt in which he was engaged: it occurred near Tcherkin:—

“The next morning we were on horseback by the dawn of day in search of the rhinoceros, many of which we had heard make a very deep groan and cry: as the morning approached several of the Agageers then joined, and, after we had searched about an hour in the very thickest part of the wood, one of them rushed out with great violence, crossing the plain towards a wood of canes that was about two miles' distance; but, though he ran or rather trotted with surprising speed, considering his bulk, he was in a very little time transfixed with thirty or forty javelins, which so confounded him, that he left his purpose of

going to the wood, and ran into a deep hole, ditch, or ravine, a *cul de sac*, without outlet, breaking above a dozen of the javelins as he entered. Here we thought he was caught as in a trap, for he had scarce room to turn, when a servant who had a gun, standing directly over him, fired at his head, and the animal fell immediately to all appearance dead. All those on foot now jumped in with their knives to cut him up, and they had scarce begun when the animal recovered so far as to rise upon his knees: happy then the man who escaped first; and, had not one of the Agageers, who was himself engaged in the ravine, cut the sinew of the hind leg as he was retreating, there would have been a very sorrowful account of the foot-hunters that day.

“After having despatched him, I was curious to see what wound the shot had given which had operated so violently upon so large an animal, and I doubted not it was the brain; but it had struck him nowhere but upon the point of the foremost horn, of which it had carried off above an inch, and this occasioned a concussion which had stunned him for a minute till the bleeding had recovered him. I preserved the horn from curiosity, and have it now by me. I saw evidently the ball had touched no other part of the beast.”

Le Vaillant's narrative of a rhinoceros in South Africa, “an immense menagerie,” as he appropriately terms the country, may interest such of our readers as are actuated by the spirit of Nimrod, and long for mightier game to follow than hares or foxes.

“In the midst of this immense menagerie, the variety of which kept me in a continual state of enchantment, I was surprised not to find that prodigious number of rhinoceroses which had been mentioned to me by the people of Haripa's horde.

“One day however Klaas, who was always concerned in every matter of importance, and the first to communicate agreeable intelligence, came in great haste to my tent to inform me that he had observed at some distance from my camp two of these animals standing quietly close to each other in the middle of the plain, and that I had it in my power to enjoy the pleasure of the finest hunt I had ever yet experienced.

“The hunt indeed promised to be amusing, but, independently of danger, I foresaw that it was likely to be attended with difficulties. To attack two such formidable enemies it was necessary to use great precaution, and that we should approach them in such a manner as that they might neither see nor smell us, which is always very difficult. I at first proposed to form a ring which should surround them on all sides, and to advance upon them, gradually contracting the circle, so as to unite the moment we were about to commence our attack; but the savages assured me that with these animals this plan was impracticable. I gave myself up therefore entirely to their direction, and we set out armed alike with a good fuscé and with the necessary courage. All my hunters wished to be of the party, and each proposed to display the greatest prowess. I caused two of my strongest dogs to be led in a leash, in order that they might be let loose on the rhinoceroses in case it should be found necessary. We were obliged to make a long circuit to gain the lea-side of them, lest they should smell us; and we reached the river, the course of which we followed under cover of the large trees that grew on its banks, when Klaas soon made us observe the two animals at about the distance of a quarter of a league in the plain. As one of them was much larger than the other, I supposed them to be a male and female.

Motionless by the side of each other, they were still in the same posture in which Klaas had first seen them, but they stood with their noses to the wind and consequently presented to us their rumps.

“It is the custom of these animals when thus at rest to place themselves in the direction of the wind, in order that they may discover by their smell what enemies they have to dread. From time to time, however, they move their heads round to take a look behind them, and to be assured that they are safe on all sides; but it is only a look, and they soon return to their former position.

“We were already deliberating on the dispositions to be made for commencing the attack, and I was giving some orders to my company, when Jonker, one of my Hottentots, requested that I would permit him to attack the two animals alone as a *vekruyper*.

“My readers will here recollect that, when I foolishly attempted to cross the Elephant's river, near its mouth, on the trunk of a tree, Jonker was one of the swimmers who saved my life, and that in return, at the desire of his companions, I raised him to the rank of hunter. At that time he was entirely a novice in this exercise, but I have already remarked that he afterwards became a most excellent shot, and surpassed all the rest of my hunters, particularly in the art of creeping. I have before observed that hunting in Africa has no resemblance to that in Europe; that to get within the reach of certain wild animals we must approach them without being perceived; and that it is impossible to get near them but by creeping on the belly. Those who have acquired this art are called *vekruypers*, and it was in this quality that Jonker asked leave to attack alone the two rhinoceroses, assuring me that he would acquit himself to my satisfaction.

“As his design would not prevent the execution of our plan, and as, in case his particular attack should not succeed, it would not impede our general one, I granted his request. He then stripped himself naked, and, taking his fusee, proceeded towards the animals, creeping on his belly like a serpent.

“In the mean time I pointed out to my hunters the different posts they were to occupy. They repaired to them by circuitous ways, each accompanied by two men. As for me, I remained on the spot where I was with two Hottentots, one of whom held my horse and the other my dogs; but, to avoid being seen, we posted ourselves behind a bush.

“In my hand I held a glass, which had often enabled me to see the operation of stage machinery and the effect of our theatrical decorations. How changed the scene! at this moment it brought before me two hideous monsters, which at times turned towards me their frightful heads. Their movements, which indicated fear and observation, soon became more frequent, and I was apprehensive they had heard the agitation of my dogs, who, having discovered them, made efforts to escape from the keeper, and rush upon them. Jonker still kept slowly advancing, but with his eyes fixed on the two animals. If he saw them turn their heads, he stopped, and remained motionless; one would have taken him for a large stone, and indeed in this respect I myself was deceived. He continued creeping with various interruptions for more than an hour. At length I saw him proceed towards a large bush of *euphorbia*, which was only 200 paces from the animals. Being certain when he reached it that he could conceal himself there without being seen, he rose up, and, casting his eyes everywhere around, to see whether his comrades had arrived at their

posts, he made preparations for firing. During the time he was creeping along I had followed him with my eye, and in proportion as he advanced I felt my heart beat with involuntary palpitation.

“ This palpitation, however, increased when I saw him so near the animals, and just upon the point of firing at one of them: what would I not have given at that moment to have been in the place of Jonker, or at least by his side, that I might have brought down also one of these savage monsters! I waited with the utmost impatience the report of the gun, and I could not conceive what prevented him from firing, but the Hottentot who stood near me, and who was able by the bare sight to distinguish him as perfectly as I could with my glass, informed me of his design. He told me that Jonker did not fire because he was waiting till one of the rhinoceroses should turn round, that he might if possible take aim at his head, and that on the first motion they made I should hear the report.

“ Presently, the largest of the two having looked behind, was immediately fired at; being wounded, he sent forth a horrid cry, and followed by the female, ran furiously towards the place where the noise had proceeded. I found my heart now agitated by the most violent emotion, and my fear was carried to its utmost extent. A cold sweat diffused itself over my whole body, and my heart beat with such force as to prevent me from breathing. I expected to see the two monsters tear up the bush, tread the unfortunate Jonker under their feet, and tear him to pieces; but he had thrown himself down with his belly on the ground, and this stratagem succeeded. They passed close by his side without perceiving him, and came straight towards me. My fear now gave place to joy, and I prepared to receive them; but my dogs,

animated by the report they had heard, became so restless on their approach, that, being unable to check them, I ordered them to be let loose, and encouraged them to the attack. When the animals saw this, they instantly turned aside, and proceeded towards another of the hunters placed in ambush, from whom they received a second fire, and then to another, from whom they received a third; my dogs, on the other hand, harassed them prodigiously, which still increased their rage; they kicked at them in the most terrible manner, ploughed up the plain with their horns, and, digging furrows in it seven or eight inches in depth, threw around them a shower of pebbles and stones.

“During this time we all kept approaching in order to surround them more closely, and to unite against them our forces. The multitude of enemies by which they found themselves enclosed rendered them completely furious. The male, however, suddenly stopped, and, turning round to attack the dogs, endeavoured to rip up their bellies with his horn, and while he was engaged in pursuing them the female quitted him and made her escape. I was highly pleased at her flight, which I considered a fortunate circumstance; for it is certain, notwithstanding our number and our arms, we should have been much embarrassed by two so formidable adversaries. I must even confess that without the assistance of my dogs we should not have been able to combat, but with great hazard and danger, the one that remained. The bloody traces which he left wherever he went announced that he had received more than one wound; but, reduced to despair, he only defended himself with the greater obstinacy.

“After a fruitless attack, which lasted for some time, he began to retreat, and seemed as if desirous

of gaining some bushes, apparently with a view of finding shelter, and to prevent his being harassed but in front. I guessed this stratagem, and, in order to disappoint him, I rushed towards the bushes, and made a sign to the two hunters who were nearest to me to advance there also. He was only thirty paces from us when we took possession of the post; accordingly, we all at the same time presented our pieces, and, discharging our three shots, he instantly fell, and was never after able to rise. I beheld his fall with the utmost satisfaction: as a hunter and a naturalist it afforded me a double triumph.

“Though mortally wounded, the animal still continued to defend himself when lying on the ground as he had done when on his legs; with his feet he threw around him heaps of stones, and neither we nor our dogs durst venture to approach him.

“I wished to put an end to his torment by firing one more ball, and was making preparations for the purpose, when my people entreated me to desist. As I could not ascribe their request to pity, I was at a loss to conceive what could be their motive. I have already said that all the savage tribes, and even the people at the Cape and in the colonies, set a high value on the dried blood of the rhinoceros, to which they ascribe great virtues. . . . The animal had lost a great deal by his wounds. It was with much regret that they saw the earth moistened with it around him, and they were apprehensive that a new wound would increase that loss.

“Scarcely had the animal breathed his last, when both old and new Hottentots all approached with eagerness in order to collect the blood. With that view they cut open its belly, and took out the bladder, which they emptied. One of them then applied the mouth of it to one of the wounds, while the rest shook

a leg of the animal to make the blood flow more readily. In a little time, to their great joy, the bladder was filled, and I am persuaded that with what was lost they might have filled twenty.

“I had approached the body also, but with a different design; for my intention was only to measure and examine it.

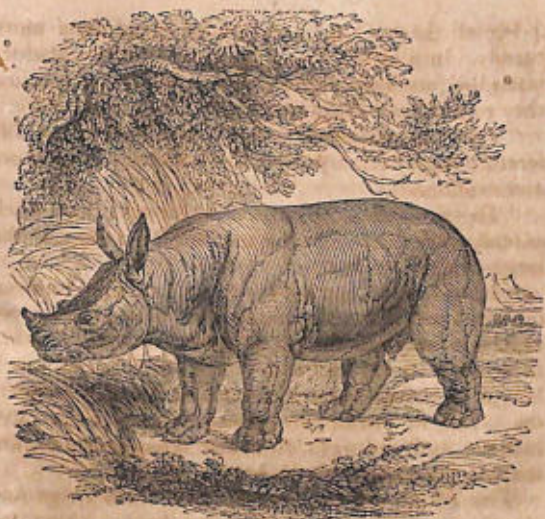
“The savages of the horde, accustomed to see such animals very often, assured me that it was one of the largest of its species.

“I however did not believe them, and what induced me to doubt their information was, that its principal horn was only (in French measure) nineteen inches three lines in length, and I had seen horns much longer, in the possession of some of the Dutch planters. The height of the animal was seven feet five inches; and its length, from the snout to the root of the tail, eleven feet six inches.”

The *Rhinoceros Africanus* feeds upon twigs and the shoots of trees or bushes, its flexible elongated upper lip serving as an organ of prehension.

It exhibits an aversion to fire, towards which it rushes with fury, so that it is not safe for parties or travellers passing the night around a fire in the districts frequented by it to go to rest, unless one of the number keep diligent watch, and arouse the slumberers on the first intimation of its approach. This precaution is indeed not always effectual. On one occasion a rhinoceros rushed with such rapidity on a military party, lodged among the bush covering the banks of the Great Fish river, that before the men could be aroused it had severely injured two of them, tossed about and broken several guns, and completely scattered the burning wood.

The second species of rhinoceros, namely, the white or blunt-nosed rhinoceros (*Rhinoceros simus*)

*Rhinoceros Sennar.*

was first described by Mr. Burchell, and a head of one was brought over to England by the missionary, Mr. Campbell. The white rhinoceros is the largest of the African species, and seems to be distinguished by the truncate form of the snout, the upper lip being square instead of pointed. With this peculiarity of form is conjoined a difference in habits. Its food consists not of twigs and shoots, but of grass: hence it resorts to the open plains, (rather than to the woods,) where its favourite food is to be obtained. Another character consists in the smallness of the posterior horn, and in the great length of the anterior, which projects obliquely forwards, and is often three feet in length. Though of colossal magnitude, the white rhinoceros is more gentle and timid than are its other African relatives, and it is

not regarded by the natives with that fear which the other two inspire.

The third rhinoceros of South Africa (*Rhinoceros ketloa*) was lately made known to science by Dr.



Rhinoceros Ketlou.—(From Dr. Smith's specimen in the British Museum.)

Andrew Smith, who discovered it during the late expedition into the interior of the country, and brought a most magnificent specimen to Europe, which now graces the British Museum. In a catalogue of the objects procured by the party under the direction of Dr. Smith, in the districts to which they penetrated, the writer observes, "Previous to June, 1835, this species of rhinoceros was not known, no doubt from its never having approached the confines of the colony; though there is reason to

believe that individual specimens have occasionally travelled as far south as Lattakoo, the kind of horns peculiar to it having reached the Cape and England from that quarter. In that country however the occurrence of this animal must have been rare, as the natives there have no name for it; and, when questioned as to the number of species, never made mention of a third. This is the very opposite to what was experienced among the inhabitants of the countries in which it more commonly occurs, who when questioned on the subject invariably mentioned three by name, viz. *ketloa*, *boreli*, and *mohooloos*. Among those which are to be regarded as wanderers, the specimen in the present collection may be classed; it having been shot about 180 miles N.E. of Lattakoo, but considerably south of the country to which the species appears more directly to belong. It was upon that occasion that the expedition first became acquainted with the name of *ketloa*, which was only familiar even there to some few persons who had formerly resided more to the northward; but on the expedition penetrating to the northward of Lurricane, every person was found conversant with the name, and able to direct to situations where the animal was to be found.

Few made mention of the *ketloa* without at the same time showing an inclination to observe upon its character; and those who had sufficient confidence in the party to venture a remark upon a native chief, then awfully oppressing that part of the country, spoke of the man and the animal as alike to be feared for their ferocity, and equally dangerous to the former inhabitants of that district.

In many points the rhinoceros *ketloa* bears considerable resemblance to the *Rhinoceros Africanus*: yet there are differences sufficiently palpable to enable even persons not very conversant in judging

of the fine shades of distinction between species readily to discover that it is distinct; such as the great length of the second horn, the more elongated and slender head, the form of the hunch on the shoulder, &c. Besides these differences, which are palpable to all, the naturalist is enabled to discover various others; the most important of which is the difference of dentition.

The form of the upper lip led those of the party who were acquainted with the *Rhinoceros Africanus* to infer that, like it, the present specimen must feed upon underwood; an inference which was completely justified by the statements of the natives, when questioned upon the subject.

As the party advanced northward the ketloa became more common, though it never occurred in so great numbers as either of the other species; and it was only on one occasion that so many as seven were seen together, though the occurrence of such a number was by no means uncommon in the cases of the other two. From its having been considered of importance to ascertain the relative proportions of the three species, directions were given to the hunters to make a daily statement of the numbers they had seen of each; and it was thus found that only sixty-eight of the ketloa were seen in the course of the journey, a number far short of that of either of the others. The interest that the discovery of this new species excited led to the making of minute inquiries as to animals of this genus; and the expedition had sufficient reason to believe, from the replies to constant questions, that two other species existed farther in the interior, one of which was described as being somewhat like the ketloa, and having two horns, the other as differing in many respects, and having only one horn.

By way of comment on the three known African

species of rhinoceros, the clever writer of the catalogue observes, "The flesh of all the three species is esteemed wholesome food by the natives, who dig pit-falls for them in situations to which they are known to resort; and sometimes, though rarely with success, attempt even to kill them with the assagai or spear. In style of motion they are all alike, and so awkward, that their swiftness is to be appreciated, not by directly watching the animal itself, but by fixing the eye upon some two points between which it careers.

"The hide is generally about an inch thick, and so compact that a leaden ball will not pierce it: hence, to kill them, it has been found necessary to add to the lead a considerable proportion of tin. The hunter who would boast of killing one of these creatures at a single shot must hit it immediately behind the ear or the shoulder; and if this be not accomplished, and the sportsman be pursued by the enraged animal, which will often happen, then his best chance of escape is either to step aside suddenly from his course and pass behind a bush, or by a well-directed shot to break one of its legs.

"As they are animals which depend much upon smell for their existence and safety, it is necessary to advance upon them from the leeward side, if it be an object to get close without being discovered. In pursuit they also trust for guidance to the same sense, and they may be heard forcibly inspiring the air when they have lost the scent of the object they were following. The ticks and insects with which they are covered furnish for them another source of intelligence, inasmuch as they attract a number of birds, which sit quietly picking them off when nothing strange is in sight, but fly away when any object excites their fear. So well does the rhinoceros understand this, that he proceeds feeding with

the greatest confidence while the birds continue perched upon his back, but the moment they fly the huge animal raises his head, and turns it in all directions to catch the scent. Whether he accomplishes that or not, he generally feels so uncertain of his position that he moves to some other locality.

“The young animal shows all the ferocity of the adult, but the party inferred, from what took place after the capture of one of the second species, that this ferocity speedily succumbs to the power of hunger.*

“When the animal in question was first procured, it butted violently at every one within his reach, though it was not much larger than a half-grown pig; but after being fastened up during the night it was on the following morning extremely mild, and quietly indicated its want of food. Subsequently it followed those who were in the habit of noticing it, and even showed signs of attachment to them; a remarkable change, as when first separated from its mother it was so savage that it actually butted for some minutes against a tree in which one of the hunters had sought shelter from the fury of the old animal.

“All the African species have two horns, for which the party could neither perceive nor hear of any other purpose than that of weapons of defence. It is true that they were sometimes seen to plough up the earth for several paces with the front horn, but with what object it was not possible to discover.

“The *Rhinoceros Africanus*, and the *Rhinoceros simus* appeared to occur in nearly equal proportions; but the *rhinoceros ketloa* was much less common,

* This is contrary to the experience we have had with specimens of the Indian rhinoceros in captivity in Europe, as previously noticed. When the animal is very young it may prove a successful mode of subjugation.

only sixty-eight individuals of that species having been seen by the expedition. Taking the three into consideration, it may, without exaggeration, be said that, in some situations well fitted for their residence, about one hundred or one hundred and fifty individuals were seen in the course of a day's journey."

Among the fossil relics of extinct animals, which at some former epoch have tenanted this globe, and, after a quiet possession (generation succeeding generation) of their pasture-lands, have passed away and become as it were blotted out of the book of nature, those of the rhinoceros are extremely abundant, little less so, indeed, than those of the mammoth or fossil elephant, and widely distributed. Occurring in the same strata, in the same localities, as those of the elephant, they have been more frequently overlooked, and less industriously collected. The teeth, as being most easily preserved in superficial situations, are the parts commonly met with; but as they are far inferior in size to the huge grinders of the elephant, and as the ponderous tusks of this latter animal have no parallel in the dentition of the rhinoceros, the attention of labouring men (and it is by such men that the discovery of fossil relics is mostly made) would be naturally absorbed in the contemplation of the more imposing objects revealed to their sight than of such as would seem comparatively insignificant; and it is thus perhaps that the reliquia of the rhinoceros, or rather of the various extinct species of the genus, appear less abundant than they are in reality. The first notice of the teeth of the fossil rhinoceros appears to be that of Dr. Grew, who gives the figure of a molar, simply describing it as the tooth of a terrestrial animal, whence it is evident that he was not aware of the animal to which it belonged. In another place, however, he speaks of a fragment of the lower jaw

of a rhinoceros, found near Canterbury, but without entering into any details; there, however, is little doubt but that he refers to one of the fragments discovered in the year 1668, in sinking a well at Chatham, at the depth of seventeen feet. Since that period fossil relics of the rhinoceros have been found in Germany, France, Italy, and Siberia, as well as in our own island, and that in considerable abundance, especially in Germany and Italy. It is, however, in Siberia that the astonishing discovery occurred of an entire animal still covered with skin. Pallas, who, in 1768, was appointed director of the museum of St. Petersburg, in which was then a vast collection of bones from Siberia, the result of researches made by order of Peter the Great (among which were four skulls of the rhinoceros), undertook himself to travel in the little-explored regions of that portion of the globe. In December, 1771, on the banks of Wiluji, which joins the Lena, he discovered below Jokoutsk (in 64° N. lat.) an entire rhinoceros with its skin, buried in the sand, and preserved by the cold. It was at the mouth of the Lena that the elephant with its flesh and skin entire was found imbedded in a block of ice, which, as it gradually melted, disclosed the stranger—the being of a prior epoch. From these and other circumstances it would seem that the borders of the Lena and its tributary streams are rich in the fossil *reliquia* of huge extinct *pachydermata*, and, among them, of those of the rhinoceros.

The remarkable discovery of Pallas, with the details respecting it, was published in commentaries of the Imperial Academy, vol. xvii., for 1773.

To enter into an account of the places and times in which the fossil bones of various species of rhinoceros have been found, and to record their first describers, would be irrelevant to our plan: we shall

therefore proceed at once to a brief account of the fossil species themselves as far as the discrimination of naturalists has enabled them to determine.

In the first place, then, we are presented with the *reliquia* of a huge species, distinguished by the division-plate of the nasal cavity being a solid bone instead of cartilage (gristle). To this species Cuvier has given the title of *Rhinoceros tichorhinus* (from *τοιχος*, a wall, and *ῥιν* nose). Of all the fossil species, it is of this that the relics have been longest known, and it was this that Pallas discovered on the banks of the Wiluji with its flesh and skin preserved. Happily, therefore, we know the form and true proportions of the living animal. The head was covered with unfolded skin, destitute of irregular callosities, in which respects, as well as in the presence of double horns, it agreed with the common two-horned rhinoceros of the Cape. The feet had three toes, as in all the extant species, but the hoofs were lost. Like the fossil elephant of Siberia, this animal was originally covered with hair: in many places this hair still remained, especially on the feet, where it was very abundant, measuring from one to three inches in length, of a stiff quality, and of a dusky grey. The head was invested in a similar clothing.

The skull of this species differs from that of the two-horned African rhinoceros, not only in the presence of the osseous nasal partition, but in general form and proportions. The length and narrowness of the skull are very remarkable, as is also the space between the orbits, which is much more contracted than in the common two-horned species, and the nasal bones are far more elongated. In the two-horned rhinoceros the disc which bears the anterior horn is a semi-sphere, in this an oblong ellipse, and a disc of similar figure supports the second horn,

whence it may be safely concluded that the horns of this fossil species were strongly compressed at the sides. The occipital ridge is elevated and drawn out backwards, so that from the highest point the occipital bone slopes at a very acute angle inwards to the condyles.

The most important character of this fossil rhinoceros, as Cuvier observes, "consists in the form of the nasal bones and in their junction with the intermaxillary. In this respect it differs not only from all other rhinoceroses, but also from all other known animals. The point of the nasal bones, instead of terminating-unconnected with, and at a certain distance above, the intermaxillary bones, descends without becoming thinner before the nasal apertures, and there presenting three projecting tuberosities, then unites by a rather thinner portion to the intermaxillary bones at the part where they join together and where they form two tuberosities.

With respect to the dentition of this species, the number of molars is seven on each side above and below, as in the living species; but it yet remains a question whether incisors were present, as in the Indian species, or wanting, as in the African. Cuvier leaves the subject in abeyance, observing, "After many researches I dare almost affirm that the most common fossil rhinoceros wanted these teeth, as does the common two-horned rhinoceros of the Cape." Yet, as it regards the species with the bony partition of the nostrils, he adds that there is some degree of variation in the accounts given of it, but only as far as the dentition of the lower jaw is concerned. He states that in a fragment from Bologna he observed no trace of incisors, and he also notices the account of Pallas, who, in reference to the first skulls he discovered, writes (1769), "I was not a little surprised that in all the four skulls there was not the

least vestige at all of incisor teeth;" and four years afterwards (1773), speaking of the specimen found on the banks of the Wiluji, he still says, "The extremities of the jaws had no vestige either of teeth or of their *alveoli*."

A few pages afterwards, however, Pallas, speaking of a very perfect skull found on the borders of the Tchikoï, says, "At the apex of the lower jaw, or, as I may say, on its incisorial margin, though no teeth were present, there yet appeared four obliterated vestiges of minute equidistant *alveoli*, of which the two outer were the most obsolete, but the intermediate were tolerably denoted by very evident *fossæ*. In the upper jaw also of this cranium an osseous tuberosity existed at the anterior end of the palate, remarkable for an almost completely obliterated fossa, denoting the former existence of an alveolus."

"If," says Cuvier, "our figure 5 be well examined, it will be seen that the edges of the intermaxillary bones do not appear large enough to have contained teeth." Collini is of this opinion. "It does not seem to me," he says, "that incisor teeth could have existed at the anterior extremity of the jaw, for no space appears in which *alveoli* can be accommodated."

Cuvier sums up, however, by observing that, if, after all, this species had incisors, they were *very small*, and confined to the lower jaw;—and we may add, that it is not improbable that they disappeared when the animal became adult, for the cranium found on the borders of the Tchikoï was that of a young animal, in which only five molars on each side had made their appearance.

Besides this huge species with the osseous division of the nostrils and without incisors, at least in the upper jaw, there are at least three other species well determined: of these the first is that discovered in Italy; it is the *Rh. leptorhinus* of Cuvier, and had

two horns like the preceding species, but its nostrils were not divided by a bony partition, and the nasal bones were far more thin; the general proportions of the animal were also more slender, and its whole contour less cumbrous and massive; it appears to have resembled the common rhinoceros of Africa. Incisors wanting.

The next species is that of which Camper procured the teeth in Germany: it was of the ordinary stature of the living species, and characterised by the presence of incisor teeth, from which circumstance Cuvier has given it the name of *Rh. incisivus*.

The last species, the *Rh. minutus* of Cuvier, was at least two-thirds less than any living species. Its reliquia were found, mixed with the teeth of crocodiles and the bones of tortoises, as well as with the teeth and bones of a rhinoceros of ordinary size, at a village termed St. Laurent, near the town of Moissac, on sinking a well of considerable depth, in a bed of sand. To theorise upon the discovery of the fossil bones of extinct species, and to draw deductions from their existence in such or such strata, is the part of the geologist. Suffice it to observe, that we may not only reasonably expect that other species from the *regnum fossile* will yet be added to the list, but that the *reliquia* of intervening forms between the rhinoceros and others of the *pachydermatous order*, will at no distant date reward the researches of science, and throw new light upon the multiplex chain of affinities, of which many links are yet to be discovered.

CHAPTER II.

HIPPOPOTAMUS.



Hippopotamus.—(From Dr. Smith's *Southern Africa*.)

FROM the earliest times to within the last century, the natural history of the hippopotamus has consisted of a tissue of errors and contradictions. Nay, some of the descriptions are so extraordinary as to make us hesitate before we regard them as really referring to the present animal. Aristotle assigns to it the mane and voice of the horse, the cloven foot of the ox, and the tail of the wild boar, together with

the size of the ass; while Herodotus, from whose account Aristotle appears to have borrowed his description, attributes to it the size of the largest of the ox tribe, and a tail resembling that of the horse. Diodorus Siculus, with a nearer approach to truth, observes that the hippopotamus approaches the elephant in bulk, and that it has three projecting teeth on each side, larger than the tusks of the wild boar; but he still leaves the animal with the cloven foot of the ox, and the tail of the horse. We cannot suppose that Pliny could have been ignorant of the description of Diodorus, yet he evidently takes that of Aristotle as his text, adding to it another error, namely, that the hippopotamus is covered with hairs like a seal, a presumption we suppose deduced from the fact of its habits being aquatic like those of the latter animal. Aristotle observes that the skin of the back is so thick that it is made into javelins; and Pliny states that it is manufactured into helmets and shields, which are impenetrable as long as they are kept from being soaked with wet; but he says nothing respecting the size of the animal itself. Setting aside the account of Diodorus, we cannot but be astonished that the above descriptions are so extremely erroneous, and especially that of Pliny,—for he had not only that of Diodorus to which to refer, but, as one might imagine, other sources of information: for he tells us himself that an hippopotamus was exhibited at Rome by Scaurus during his ædileship; and we learn besides from Dio that Augustus exhibited another in his triumph over Cleopatra.

Subsequently to the time of Pliny, several instances of the exhibition of the hippopotamus at Rome are on record. Antoninus exhibited this animal with crocodiles, &c. Commodus on one occasion showed five hippopotami, and on another

killed one with his own hand. Heliogabalus and Gordian III. are also stated to have possessed this animal.

Nevertheless we find no improvement in the description of the hippopotamus by ancient writers subsequent to Pliny up to the fourth century, at which period it was described by Achilles Tattius, who is not, however, altogether free from errors. "The body and feet," he observes, "are like those of a horse, except that the hoofs are divided; its size is that of the largest ox; its tail is short, and like the rest of the body destitute of hair; its head is of a rounded form and large size; its jaws are like those of the horse; its mouth extends below the temples; its chin is large; its nostrils very wide, and exhaling a hot vapour; its canine teeth are curved like those of the horse, but of three times larger magnitude."

Several ancient representations of the rhinoceros speak more in behalf of the accuracy of the artists than of the writers on natural history of the classic ages. Among these representations may be noticed the figure of this animal, with the ibis, the crocodile, and the lotus, on the plinth of the statue of the Nile; and three excellent figures in the Prenestine Pavement, which was formerly part of the pavement of the goddess of Fortune at Prenestum. The animals are there associated with crocodiles, and two are wounded by darts, launched from a vessel, in which are men in the act of throwing javelins at one of them. The head of a third is seen just above the water.

In the 'Antiquities of Herculaneum,' vol. ii., are plates of Egyptian subjects, with the crocodile and the hippopotamus, the duck and lotus leaves, floating on the water, associated together.

The hippopotamus occurs on various gems and

medals. In some of the medals of Hadrian it is associated with the crocodile and the figure of the Nile; in one the hippopotamus is mounted by a child. In most, if indeed not in all instances, the figures of this animal cannot be mistaken; in some instances they are good. The middle ages were not distinguished by any advance in the science of natural history: we are not, therefore, to expect that the writers of that epoch should give us any information relative to the present animal. The Arabic writer Abdallatif, however, describes the hippopotamus very correctly in his 'Relation of Egypt.' (See Translation by M. de Sacy.)

Europe, neither in the middle ages, nor in more recent times, up to the present day, has received within her boundaries a living hippopotamus. Our knowledge of the animal and its history is derived, therefore, from the relations of travellers,—from drawings made on the spot representing it,—from its preserved skin, and from its bones, brought over to our country.

Belon, in the middle of the sixteenth century, is the first among the moderns who had an opportunity of seeing the hippopotamus alive. This occurrence took place during his sojourn at Constantinople. His account of it, from memory, in his 'History of Fishes,' is of little value, and his two figures are mere copies from the medal of Hadrian and the statue of the Nile, with a correction as to the number of the toes, which in the figures on the plinth are five instead of four.

It was at Constantinople where Gyllius, according to his letter to Cardinal d'Armagnac (quoted by Prosper Alpinus), also saw a hippopotamus, and it is most probable that the individual was that seen by Belon.

The commencement of an accurate knowledge of

the hippopotamus may be referred to the year 1603, for it was at this time that Frederico Zerenghi, a surgeon of Narni in Italy, printed at Naples the history of two of these animals, which he had taken alive in a pit or trench dug close to the Nile near Damietta. This work was almost consigned to oblivion, until Buffon rescued it, and claimed for its author that credit which had been unjustly usurped by others. It is to Zerenghi that we owe the first scientific account of the hippopotamus. The skins which he brought from Egypt were of a male and female; his figure was taken from the latter, but it is not good. In 1616 Fabius Colonna published a far better figure of the same individual, and a good description.

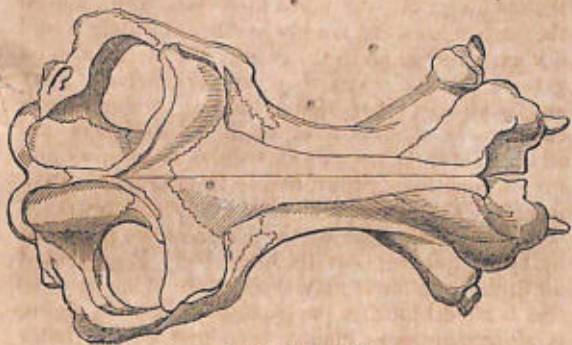
A figure and description of the hippopotamus are given by Aldrovandus in his 'History of Animals,' 1638; and by Prosper Alpinus, who died professor at Padua in 1617, but whose work was published only in 1735.

This work, however, served rather to envelop the history of the hippopotamus in a maze of difficulties and confusion than to add to our knowledge. Having seen at Cairo two stuffed specimens, from which the skulls and teeth had been removed in preparing the skin, he regarded them as specifically distinct from the *hippopotamus* of the ancients, which had large projecting canines, but at the same time as identical with the figures on the plinth of the statue of the Nile, and those on the medals of Hadrian. To this supposititious species he assigned the name of *chæropotamus*, believing that the Greeks thus distinguished it from the true *hippopotamus*. This hypothesis has been long regarded as altogether untenable. Ludolphe gives good figures of the hippopotamus in his 'History of Abyssinia,' 1687, and Thèvenot, in his 'Voyage au Levant,' 1689, gives

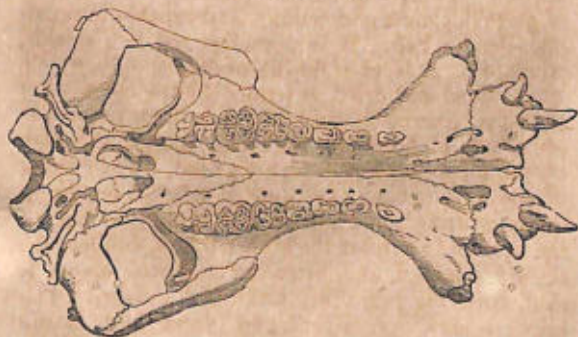
the description of an individual which was killed near Cairo, but without a figure.

Purchas, in his 'Pilgrimage,' gives, on the authority of Antonio Fernandez a Jesuit, who travelled in Abyssinia above two centuries ago, a correct account of this animal:—"Their river-horses doe much harm to the fruits of the earth, being of vast bodies, and their mouth three-quarters of a yard in the opening. In the night they come forth, and, if the husbandmen did not keepe diligent watch, would doe extreme harme to the corne; they feede also on grasse. In the water they are very fierce. They are so afraid of fire, that a burning firebrand will chase away thousands of them. Some there are which hunt these beasts with launces and arrows, and live on their flesh, little differing from beefe."—Pt. i. p. 852. The hippopotamus is exclusively restricted to Africa, and, next to the elephant, is the most bulky of quadrupeds; its huge body is supported on limbs even lower than those of the rhinoceros, so that it almost touches the ground; indeed its figure is altogether more clumsy than that of the latter animal. Though not disposed in folds, its hide is of great thickness and solidity, and capable of resisting a leaden ball. It is manufactured into shields, whips, &c. A layer of fat lies under the skin, which, when salted and dried, is termed by the colonists of the Cape *sea-cow's speck*, and is in high request as an article of luxury for the table; indeed, the flesh of the hippopotamus is highly prized. The surface of the skin is nearly destitute of hairs, a few being thinly scattered, and not at first apparent; but on the lips they are more thickly set, stiffer, and longer: these are turned, and, when the enormous mouth is shut, cover the projecting tusks and incisors. The eyes are small, prominent, and placed high in the head, the ears small and pointed, and the tail short

and thick. The toes are four on each foot, and armed with small hoofs; the stomach is divided into several sacculi; the grinders are six on either side in each jaw, the three first are conical, the three posterior have each two conical elevations on their surface, which, as they wear down by use, give an outline of enamel of the form of two double trefoil-leaves.



Upper part of Skull.



Under part of Skull.



Lower Jaw.

Stupid and ferocious if provoked, the hippopotamus lives exclusively on grass, corn, the luxuriant herbage of marshes, and twigs, and night is the season of its activity. During the day it remains concealed among the tall and dense vegetation along the borders of the water, or in the water itself, generally, indeed, the latter; to which, on the approach of danger, it has immediate recourse. It not only swims and dives with great facility, but is said to be also capable of walking along the bottom of the river as if on *terra firma*. It is gregarious in its habits, and when one is wounded the troop hasten to the assistance of their companion, rendering it very dangerous to attack them in boats, which they either upset or destroy. If unprovoked, however, the hippopotamus is harmless, and in places where fire-arms have been introduced the animals betake themselves to the water on the appearance of a human being, unless indeed the young are in danger, when the dam advances with fury on the aggressor. In some places the havoc committed by these bulky animals in the fields of corn, during their nocturnal rambles

in quest of food, amounts to a serious evil. In Dongola, according to Burckhardt, the hippopotamus is a dreadful plague on account of its voracity and the want of means in the inhabitants to destroy it. It is taken occasionally in pitfalls, covered with reeds or turf, but, beyond this, the natives employ no effectual measures to prevent its incursions. The enormous quantity of food required for the support of one of these animals may be estimated from the circumstance of Burchell's finding six bushels of masticated grass in the stomach of one which he examined; but, besides the quantity actually devoured, the animal tramples and thus destroys as much or more than is eaten, so that one or two will absolutely ruin a tolerable-sized corn-field in a single night.

Though the river or lake is the retreat of the hippopotamus, it must not be supposed that the animal is capable of suspending respiration for an indefinite or long-continued period; on the contrary, it has to rise at short intervals to the surface in order to breathe: if beset by foes this act is instantaneous; the surface of the head appears for a single moment and then vanishes: at other times the animal is leisurely in its movements, and numbers are often seen quietly floating or swimming, with the upper surface of the head out of the water, so as to allow the animals both to breathe and gaze around.

We have said that Zerenghi killed his specimens of the hippopotamus near Damietta, and that the one described by Thèvenot was killed near Cairo: the circumstance of the *locality* in both these instances is very remarkable, for in the present day, though Egypt and the banks of the lower Nile are less populous than in ancient times, this animal is seldom or never seen below the cataracts. It is not until the traveller enters Nubia and Abyssinia that

he meets with the hippopotamus; not that it is restricted to these countries of Africa—on the contrary, it is very extensively spread through this vast continent wherever large rivers or lakes afford it a congenial habitat.

In Senegal, Guinea, Congo, &c., the hippopotamus is more or less abundant, and it still frequents the Gariép and other rivers in South Africa, without the limits of the colony. In former times indeed it was common within those limits, but has long been driven back by the fire-arms of the colonists. Indeed, when the British took the Cape of Good Hope from the Dutch in 1795, the only place then within the boundaries of that colony where these animals were to be found was the Berg river; and their preservation at that river was owing to one of the Dutch governors (M. Tulbach), who thought it a pity to extirpate them entirely, and set a fine of a thousand guilders upon the destruction of an hippopotamus. (About the year 1750.)

In the year 1802 the German traveller Dr. Lichtenstein was at the Berg river, in which he states there were then ten or a dozen, but not more, of these monsters, and that these scarcely ever appeared by daytime, but often came on shore at night, and did great damage in the fields, not only eating the young corn, but trampling down a great deal more with their heavy, unwieldy feet. He further observes that they no longer tenant the Sea-cow river, so termed from the numbers of hippopotami (called also sea-cows, or river-horses) which once abounded in it: in the Gariép or Great Orange river, however, and in the wild country of the Bosjesmans, they still exist; being in these solitudes rarely disturbed by a hunter with fire-arms. On reaching the Orange river Lichtenstein saw everywhere the traces of huge ponderous footsteps, and numbers of the monsters

putting their noses above the stream to take in fresh air. The huntsmen here either watched for their appearance on land by night, like the Swedish traveller Sparman, or they fired at them by day when they exposed their snouts to breathe. "Although," says Lichtenstein, "a wound thus given is scarcely ever in itself mortal, yet the pain and loss of blood sustained oblige the animal to rise more frequently and higher above the surface of the water, and thus the hunters are furnished with opportunities to repeat the fire again and again, till the animal is at length subdued."*

The Doctor and his companions began an attack of this kind; but one of the party, happening to fire in too great a hurry, missed, and the hippopotami, that had been snorting and blowing close to them, alarmed by the report of the gun, hastened to the opposite shore of the river, where they remained out of reach.

The wild Bosjesmans, whose poisoned arrows and darts cannot penetrate the thick hard hide of the beast, yet by cunning and contrivance frequently make the hippopotamus their prey. They watch the places where these animals land at night to graze, and thereabout they dig large and deep pits, which they afterwards most ingeniously cover over with branches, twigs, leaves, and grass. In the midst of this trap they plant a stake firmly in the ground, and on the sharp-end of this their ponderous victim falls and transfixes itself. Besides the hippopotamus, the rhinoceros, and sometimes even the wary elephant, become the prey of these weak savages.

When Mr. Barrow was in the same part of Africa, only four or five years before Dr. Lichtenstein, he found on one of his journeys vast numbers of hippo-

* 'Travels in Southern Africa,' vol. ii.

potami near the mouth of the great river into which the Sea-cow River falls. They were snorting and blowing in every direction, and under the shade of the trees and on the reedy banks were broad beds, where these enormous animals had been rolling themselves on venturing forth from the deep stream.* When Mr. Barrow on another journey reached the same place he found the water of the river very low, and all the hippopotami gone. From this circumstance he concludes that these animals migrate to other rivers, according to the season and the supply of water. He is of opinion that they perform these journeys overland, as the sea affords them no sustenance. It is very true that the sea itself affords the hippopotamus no sustenance, yet we are informed on the best authority that where it can exercise a choice, the animal ever prefers the sea to fresh-water rivers; at night they come ashore to browse and obtain *fresh* water for drink, and then return to the sea again with the dawn of morning. It is, therefore, much more probable that in seasons of drought the hippopotamus follows the course of the river, where practicable, to its embouchure in the sea, than that it travels overland in search of other waters: moreover, in seasons of drought it would be a hopeless search, for the causes affecting one river affect the whole of the streams and lakes or pools throughout a vast extent of country, and vegetation perishes. It is much more reasonable to suppose that, as the river becomes shallower and shallower, the hippopotamus pursues its course downwards (requiring depth of water for its concealment), till at last it reaches the river's mouth: thus, as the stream diminishes, part after part is successively abandoned.

The aquatic propensities of the hippopotamus

* 'Travels in Southern Africa,' vol. i.

develop themselves at an early age; the young calf, under the guidance of its mother, betakes itself a few hours after birth to the water, in which it is perfectly at home. Thunberg, in his 'Second Journey into Caffraria' (vol. ii.), gives us, on the authority of a colonial hunter, an instance, to be taken no doubt with some allowance, of the innate propensity of the young hippopotamus for the water. The account, if true, displays a degree of wanton barbarity which cannot be justified; it is as follows:—"Our landlord was an elderly man and born in Europe: he was one of the keenest sportsmen in the country, and had made long journeys at various times into the interior part of the coast of Caffraria in order to shoot elephants, by the sale of whose teeth he had acquired a tolerable fortune. He related to me upon his honour several circumstances to which he had been an eye-witness, and which a traveller is so very seldom fortunate enough to have an opportunity of seeing himself. Once, for instance, when he was out a-hunting, having observed a female hippopotamus that had gone a little way up from a neighbouring river to calve, he with his suite lay still and concealed in the bushes till the calf made its appearance, when one of them fired and shot the mother dead on the spot: the Hottentots, who imagined that after this they could catch the calf alive, immediately ran out of their hiding-place, to lay hold of it, but, though there were several of them, the new-born calf got away from them all, and made the best of its way to the river, without having previously received any instruction from its mother, either relative to the way it should take or to this most natural means of saving itself."

We cannot, notwithstanding the pledge of honour given, lay much stress on this marvellous statement: other accounts, however, testify to the fact that the

young hippopotamus, while yet under the care of the mother, is as aquatic as herself. Le Vaillant, in quest of a young one, which had been seen, states, that on reaching the river, as he was carelessly leaping from one rock to another, an animal suddenly crossed his path. Without giving himself time to examine it, he fired, and broke its leg. "This was," says he, "the little hippopotamus of which we were in search. We ran to intercept its passage, and prevent it from gaining the water; but we had scarcely come up to it when the mother appeared a few paces off, on the edge of the river, running towards us with fearful howlings, and opening wide her tremendous jaws. This sudden and unexpected appearance made such an impression upon us, that we thought of nothing but flight; and every one threw away his gun to run the faster. I hesitated not to do the same with mine, as it was unloaded, and of course useless for my defence. The mother, having recovered her young one, did not attempt to follow us, but returned quietly with it to the water." —Vol. iii. p. 33.

The young hippopotamus comes ashore with its mother for the purpose of being suckled: hence, while nursing their young, these animals are more frequently seen on dry land, or in shallows, and among the reed-beds near the rivers' brink, than at other seasons; they are also much fiercer, and not unfrequently commence the attack, especially if suddenly interrupted. Their defence of their offspring is so determined, that even in places where the animal abounds it is more difficult to obtain young individuals than adults. Sparrman was fortunate enough to obtain a very young specimen, and other travellers have occasionally shot them. The ardour which Sparrman displayed in the pursuit of the hippopotamus borders on the ludicrous. Having

started from the Cape of Good Hope for the interior of the Hottentot and Caffre countries, he tells us that he and his comrade (Mr. Immelman) resolved never to shave or clip their beards until they should either get into company again with "Christian lasses," or gain the long-desired opportunity of dissecting a hippopotamus!

After crossing the Great Fish River they found a number of skulls of hippopotami lying near the bank, and these on an attentive examination Sparrman found perfectly answerable to the description and drawing given of those parts of the animal by Buffon.

It was not, however, for some weeks, and until he had returned to the *same river*, that he saw the living animal. While waiting for their appearance, he was told by some Caffres that here they were scarce and shy, but in their country the hippopotami were constantly seen coming out of the river, and grazing in numerous herds even in the middle of the day. This assertion Sparrman could credit, as the inner part of Caffraria was wild and thinly inhabited, and the Caffres there had not yet acquired the use of fire-arms. At last, on a favourable dark evening, the naturalists were conducted by some Dutch boors and Hottentots to a pit connected with the river, three-quarters of a mile long, and with steep banks, to which it was known the hippopotami often resorted. The white men, to the number of five, placed themselves in ambush at this spot, while the Hottentots went along the river cracking their enormous whips, and making other noises to drive the animals in the direction of the hollow.

After they had waited in the most profound silence and with ready muskets for an hour and a half, Sparrman saw the enormous animals approach the mouth of the hollow, but they seemed suspicious of the pass, and when they had swum up

and down and blown themselves for a time, uttering "a short, but sharp and piercing noise, something between grunting and neighing," they disappeared. As Sparrman and his friend stood anxiously awaiting the re-appearance and encounter with a huge monster whom they had been informed had given proof of being able to bite a man asunder at one snap, the dead silence was broken by a Hottentot who discharged his gun—they expected to hear the fall of a creature whose bulk equalled that of an elephant, but they only heard the loud report of the heavily-loaded musket echoed along a chain of mountains, and the screams of a numerous troop of baboons, which, by their calling and answering each other along a straight line, were discovered to be encamped on a steep, rocky hill in the neighbourhood, with regular outposts and sentinels. In a few minutes this noise ceased, and perfect silence reigned until a second Hottentot fired, and then another, but shorter alarm, went through the outposts and head-quarters of the watchful baboons.

Having passed a night in ambush with no other adventures than these, Sparrman and his friend saw the day dawn on their unsatisfied curiosity. The Hottentot sportsmen, who alone had had "a shot," excused themselves for their want of success by the darkness of the night, and by the circumstance that only one monster had exposed a sufficient portion of head and body above water to permit a shot's taking effect.

So determined, however, were the Swedes on the spot, that they remained at the spot till the afternoon, and, being still unsuccessful, removed then to another hollow by the river-side where hippopotami had sometimes been seen. Whilst waiting here Sparrman had a more sudden and a closer view than he could desire of a live and free monster. To pro-

tect himself from the assaults of mosquitoes he had thrown his pocket-handkerchief over his face, when suddenly he was aroused by the cries of his men, and by a rattling, watery sound, as though the river had overflowed its banks, and looking up he saw a huge hippopotamus had risen out of the river, and was coming towards him at speed. Sparrman ran, leaving both his guns, undischarged, behind him, but fortunately at that instant one of his companions fired his piece, and this, flashing full in the animal's face, contributed perhaps more than any effect of the ball, to make it start back, which it did with a hideous cry, and plunged into the river.

The description of the monster as it appeared to his affrighted eyes is happily and strikingly drawn by Sparrman, who says that its wet and slimy sides, glittering in the light close above him, looked like a column of water about to drown him and wash him away.

Not discouraged by these failures, the travellers went the next day to another hollow or landing-place of the monsters, and again the following day, waiting with exemplary patience for their appearance. At last, when it had grown very dark, they could just perceive at intervals a hippopotamus put his snout above the water, and hear him utter the usual angry cry, between a grunt and a neigh, but, as fires were lit at all the other landing-places, and they probably scented the sportsmen, though in the dark, they would not quit the river nor expose more than their snouts. For these two days and then another, they watched in vain, but, at last, a little after sunrise, on the fifth day they had been engaged in the business, and as they were about abandoning it in despair, a female hippopotamus, with her calf, came to the very hollow which they were blockading. As the mother was ascending rather a steep bank, and

was looking back on her calf, which was lame, a Hottentot fired—the ball struck her—she turned, heedless of her young one, and instantly plunged into the river. In the mean time, another Hottentot caught hold of the lame calf by its hind legs, and held fast till the rest of the party came to his assistance. The captive calf was then bound fast with ropes and dragged off in triumph, though, for some distance the Hottentots were sorely afraid lest its mother and other hippopotami, attracted by the cries it made, should rush to the rescue.

Its noise Sparrman describes as having been similar to that of a hog going to be killed, but more shrill and harsh. It never ceased to make this noise, and violent efforts to release itself as long as it was tied; but as soon as it was turned loose it ceased crying, and when the Hottentots had passed their hands several times over its nose to accustom it to their effluvia, it directly began to take to them with affection. Although the Hottentots thought it was not three weeks old, it was already three feet and a half long, and two feet high, and very strong. It was not at all nice as to its food, but almost immediately ate whatever was given to it or fell in its way.

Sparrman concluded, from the docile disposition of this calf, that hippopotami might easily be tamed, if caught young and sent over to Europe alive, as they were in the time of the ancient Romans. Certainly the attempt is well worth making: we believe that the council of the Zoological Society of London have offered a premium for the first imported.

Sparrman did not try the experiment on this calf, which, after he had made a drawing of it, was killed, dissected, and eaten. It had four stomachs. Its flesh was flabby from want of age, and very in-

ferior to that of the mature hippopotami, which the naturalist found to be delicately tender—the fat having a taste like marrow. Indeed, this was considered by the Dutch colonists as the best meat that could be eaten. The gelatinous part of the feet, when properly dressed, was esteemed as a great delicacy, and the dried tongue was held as a savoury but rare dish at the Cape of Good Hope. The dried skin of the calf, which Sparrman took home to Sweden with him, was about the thickness of the sole of a shoe, and, at the same time, very stiff. It had very little hair of any kind; there were some reddish-brown hairs, from a quarter to half an inch long, inside of the ears, and others about the nose and the back of the neck, but they grew thin and scattered. Other hairs of the same sort, but still more scattered and shorter, grew upon the back and at the edges of the tail—all the rest of the skin was quite bare of hairs. The tail was flattened at the sides, and the edges or sharp parts appeared upwards and downwards, like the tail of the rhinoceros. The tusks of the animal were already grown to the length of half an inch.

The skin of the full-grown hippopotamus is rather thicker than that of the rhinoceros, to which it bears a close resemblance. Mr. Burchell compares its colour to a light tint of India, or rather China ink. The same traveller compares the stripping off the skin from a full-grown hippopotamus to the rending of a ship's timbers from their ribs.*

Whips made of its hide were very strong and flexible, and preferred to those made of rhinoceros-skin.

Sparrman thinks with Father Lobo, that the hippopotamus feeds entirely on herbs and grass, and

* Vide Travels in Africa.

is of opinion that Dampier is incorrect in describing it as hunting for fish. He, however, confirms the fact of their being found in the sea, and says he saw them himself rolling and blowing themselves in open daylight off the mouths of the Kromme and Cantour rivers, but adds that they go on shore both for food and drink. He was told of one in particular, which, having been disturbed in the river, took refuge in the sea, but went on shore every night to drink fresh water at a well, until it was killed by some men who waylaid it there.

The habits of the hippopotamus in Northern and Western Africa, as described by travellers, correspond with those attributed to it in the southern regions of that continent. In some parts of Abyssinia the animal is very common, and does much injury to the cultivated fields adjacent to its habitual haunts.

And here the question presents itself—was the hippopotamus, when Egypt was in her glory, common in the Nile, below the falls, or near the cities of that empire? We think not. The existence of a huge beast like this in the midst of a district well peopled with civilised inhabitants seems a sort of anomaly. The public welfare and the existence of these monsters, which, in order to exist, must commit depredations upon the corn-fields and gardens, are incompatible with each other. If, indeed, at a period beyond historic records, they tenanted the Nile to its delta, they were forced to retire as Egypt rose in importance, driven to a greater and greater distance, till, at length their occurrence would be as rare as in the present day. Whence then came those exhibited in Rome? Doubtless from the districts of Nubia and Abyssinia, which are now tenanted by them—a fact which their comparative rarity seems to prove; for, were they then common in the Egyptian Nile, they would have been more

frequently shown, and more would have been known and said about them. When Egypt sank under the arms of Rome, the hippopotamus was a rarity. A solitary example graced the triumph of Augustus over Cleopatra.

We learn from Mr. Salt that it is in the district of Abyssinia watered by the river Tacazze, a noble tributary to the Nile, that this animal abounds: its Abyssinian name is Gomari.

Mr. Salt had scarcely reached the bank of that stream when he heard a noise in the water, and his attendants crying out "Gomari! Gomari!" Upon that occasion, however, he only obtained a momentary view of the immense creature, whose action in the stream he compares to the rolling of a grampus in the sea. Advancing along the line of the river, our traveller found it interrupted by frequent overfalls and shallow fords. Between these shallows he observed holes or pits of almost immeasurable depth, and which very much resembled the small lochs or tarns found among the mountains of the north of England and Scotland. It is to these depths that the hippopotami delight to resort. Mr. Salt soon came to one where several of them were assembled, and, having crossed the river at a ford, and gained a high overhanging rock that commanded the deep pool, he and his party prepared their muskets. They did not remain long on the spot before they discovered, at the distance of only twenty yards, a hippopotamus rising to the surface of the water. The animal came up very confidently, elevating its enormous head above the water, and "snorting violently, in a manner somewhat resembling the noise made by a porpus." The instant the head was fairly exposed three of the party fired, but, though the contents of their guns appeared to hit it on the forehead, the animal merely turned its head

round with an angry look, and, making a sudden plunge, sank down to the bottom, uttering a noise that was something between a grunt and a roar. Mr. Salt and his companions, however, could not but fancy they had killed, or at least seriously wounded, the monster, and expected every moment to see its huge body float up to the surface. But an hippopotamus is not so easily killed. In a few minutes it indeed rose up, and nearly in the same place, but apparently unhurt, and little concerned at what had happened, though rather more cautious than at its former appearance. Again several guns were fired at it, but with no more effect than before; and though some of the party, eager in the sport, remained at their posts all day, and fired at every hippopotamus that appeared, there was after all no evidence to show that the slightest impression was made on any one of them. "This," says Mr. Salt, "can only be attributed to our having used leaden balls, which are too soft to enter the impenetrable skulls of these creatures, as we repeatedly observed the balls strike against their heads." Balls composed of tin mixed with lead, like those used by Sparrman and his friends, would, of course, have been more effective. Towards the end of the day, and after all this firing, they came up with extreme wariness, merely putting their nostrils above the level of the stream, breathing hard, and spouting up the water like the jets of fountains.

"It appears," continues Mr. Salt, "from what we witnessed, that the hippopotamus cannot remain more than five or six minutes at a time under water, being obliged to come up to the surface in the course of some such interval for the purpose of respiration. One of the most interesting parts of the amusement was to observe the ease with which these animals quietly dropped down to the bottom; for,

the water being very clear, we could distinctly see them so low as twenty feet beneath the surface. I should conceive that the size of those we saw did not exceed sixteen feet in length, and their colour was a dusky brown, like that of the elephant." As the novel scene particularly struck Mr. Salt, while his Abyssinians were shooting he made a sketch of it, which will be found beautifully engraved, and giving an excellent notion of the sport, and of the sublime scenery of the river Tacazze, in that gentleman's volume of Travels.

It has generally been asserted that this huge, powerful, and, it should seem, inoffensive animal has no enemy in the brute creation audacious enough to contend with it. Some travellers, however, have attributed this boldness to the crocodile, describing combats between them, and on this idea Mr. Landseer has given a very spirited drawing, in which an hippopotamus is crushing the hard scaly sides of a crocodile, and breaking its foe in two between its tremendous jaws.

There is reason, however, to believe that such combats never take place, and that no enmity subsists between the two animals. While Mr. Salt and his party were engaged shooting at the hippopotami, they frequently observed several crocodiles of an enormous size rise together to the surface of the same stream, apparently regardless of, and disregarded by, their still more enormous neighbour.

Burckhardt (see his 'Travels in Nubia') informs us that lower down the Nile, in Dongola, where there are neither elephants nor rhinoceroses, the hippopotamus is very common. The Arabic name for it is barnik. It is a dreadful scourge to the inhabitants, who lack the means of destroying it. Occasionally, but rarely, it is seen much farther ^{holds a free} ^{whose h} even below the cataract of the Nile at As-

souan. The whips known in Egypt under the name of korbadj are made of its skin, and form an important article of trade with the Sennaar and Darfour caravans. "After being taken off, the skin is cut into narrow strips, five or six feet long, and gradually tapering to a point; each strip is then rolled up so that the edges unite and form a pipe, in which state they are tied fast, and left to dry in the sun. To render them pliable, they must be rubbed with butter or grease. In Egypt, where they are in general use, and the dread of every servant and peasant, they cost from half a dollar to a dollar each. In colder climates, even in Syria, they become brittle, crack, and lose their elasticity."

We have translated the following account of the mode of killing the hippopotamus in Dongola from the Travels* of Dr. Edward Rüppell, a careful observer and a trustworthy writer. Dongola is a narrow slip of country lying on both sides of the Nile, and extending southward from $19^{\circ} 43'$ of north latitude for about 170 miles, measured along the course of the stream.

"The harpoon, with which the natives attack the hippopotamus, terminates in a flat oval-shaped piece of iron, three-fourths of the outer rim of which are sharpened to a very fine edge. To the upper part of this iron one end of a long stout cord is fastened, and the other is tied to a thick piece of light wood. The hunters attack the animal either by day or by night, but they prefer daylight, as it enables them better to escape from the assaults of their furious enemy. One part of the rope with the shaft of the harpoon the hunter takes in his right hand; in the left he holds the rest of the rope to the piece of wood. Thus armed, he cautiously approaches the animal. These are the means by which the hunters succeed in killing the animal; for,

* 'Travels in Nubia,' 1824-5, &c. Frankfort-on-the-Main; for, 1829. German.

proaches the animal when he is asleep during the day on some small island in the river, or he looks for him at night, when the hippopotamus is likely to come out of the water to graze in the corn-fields. When the huntsman is about seven paces from the beast, he throws the spear with all his might, and if he is a good marksman the iron pierces through the thick hide, burying itself in the flesh deeper than the barbed point. The animal generally plunges into the water; and, though the shaft of the harpoon may be broken, the piece of wood that is attached to the iron floats on the surface, and shows what direction he takes. There is great danger if the hippopotamus spies the huntsman before he can throw his spear. He then springs forward with the utmost fury, and crushes him at once in his wide open mouth; an instance of which took place while we were in the country.

“As soon as the animal is fairly struck, the huntsmen in their small canoes cautiously approach the floating wood, and, after fastening a strong rope to it, they hasten with the other end towards the large boat, which contains their companions. The huntsmen now pull the rope, when the monster, irritated by the pain, seizes the boat with his teeth, and sometimes succeeds in crushing or overturning it. In the mean time his assailants are not idle: four or five more harpoons are plunged into him, and every effort is made to drag the beast close up to the boat, so as to give him less room to plunge about in. Then they try to divide the *ligamentum nuchæ** with a sharp weapon, or to pierce his skull. Since the body of a full-grown hippopotamus is too bulky to

* The suspensory ligament (an elastic substance), which holds the heads of quadrupeds in their places, so as to allow a free movement downwards, is particularly strong in all those whose heads are of great weight.

be pulled out of the water without a great number of hands, they generally cut him up in the water and bring the pieces to land. In the province of Dongola not more than one or two of these animals are killed in a year: from 1821 to 1823, inclusive, nine were killed, out of which number we despatched four. The flesh of a young hippopotamus is very good; but the full-grown ones are generally too fat. They weigh as much as four or five oxen. The hide is made into excellent whips, and will furnish from 350 to 500. No use is made of the teeth.

“One of the hippopotami which we killed was a very old fellow, and of an enormous size, measuring $13\frac{1}{2}$ French feet from the nose to the extremity of the tail. His incisive teeth were 26 French inches long, measured from the root to the point, along the outer bending. We fought with him for four good hours by night, and were very near losing our large boat, and probably our lives too, owing to the fury of the animal. As soon as he spied the huntsmen in the small canoe, whose business it was to fasten the long rope to the float, he dashed at them with all his might, dragged the canoe with him under the water, and smashed it to pieces. The two huntsmen with difficulty escaped. Of twenty-five musket-balls aimed at the head from a distance of about five feet, only one pierced the skin and the bones of the nose: at each snorting the animal spouted out large streams of blood on the boat. The rest of the balls stuck in the thick hide. At last we availed ourselves of a swivel; but it was not till we had discharged five balls from it at the distance of a few feet, and had done most terrible damage to the head and body, that the colossus gave up the ghost. The darkness of the night increased the danger of the contest, for this gigantic animal tossed our boat about in the stream at his pleasure; and it was at a

fortunate moment indeed for us that he gave up the struggle, as he had carried us into a complete labyrinth of rocks, which, in the midst of the confusion, none of our crew had observed.

“For want of proper weapons the natives cannot kill an hippopotamus of this size: all they can do to drive him from their fields is to make a little noise in the night, and to keep up fires at different spots. These animals, from their voracity, are a curse to a whole district; and in some places they are so bold that they will not quit the fields which they are laying waste till a great number of men come out with poles and loud cries to attempt to drive them away.”

The hippopotamus was observed in great numbers in the Niger by Richard and John Lander, and that not without some apprehensions from their boldness and power.

“They rose,” observe the narrators of the expedition, “in incredible numbers very near us, and came plashing, snorting, and plunging all round the canoe, and placed us in imminent danger. Thinking to frighten them off, we fired a shot or two at them, but the noise only called up from the water and out of the fens about as many more of their unwieldy companions, and we were more closely beset than before. Our people, who had never in all their lives been exposed in a canoe to such huge and formidable beasts, trembled with fear and apprehension, and absolutely wept aloud. . . . Our people tell us that these formidable animals frequently upset canoes in the river, when every one in them is sure to perish. These came so close to us that we could reach them with the butt-end of a gun. When I fired at the first, which I must have hit, every one of them came to the surface of the water, and pursued us so fast over to the north bank, that it was

with the greatest difficulty imaginable we could keep before them. Having fired a second time, the report of my gun was followed by a loud roaring noise, and we seemed to increase our distance from them. There were two Bornou men among our crew, who were not so frightened as the rest, having seen some of these creatures before on Lake Tchad, where, they say, they abound.

"However, the terrible hippopotami did us no kind of mischief whatever: no doubt, at first, when we interrupted them, they were only sporting and wallowing in the river for their own amusement, but, had they upset our canoe, we should have paid dearly for it."

A messenger that followed them on the Niger from Zagozhi was annoyed by the hippopotami just in the same manner, but also escaped unhurt.

As they proceeded farther down the river, a Gungo chief presented them with a piece of hippopotamus flesh, in a clean white calabash; their African companions pronounced the meat to be rich and delicious.

The enterprising and lamented Clapperton, who had frequent opportunities of observing hippopotami during his African expedition, informs us that in the Lake Muggaby (sometimes called the Lake of the Sultan of Bornou), which is three miles and a half long, by an average breadth of one mile and a half, he saw a vast number of these animals, which every now and then thrust their black heads above the surface of the water; and that, on returning late one evening to the same lake, he saw its margin and shallow waters crowded with horses grazing, and men bathing, whilst in the centre of its dark blue surface a host of hippopotami were sporting—constantly throwing up their black muzzles and spouting out the stream. Another evening, when

he was on the shores of the same lake, his African friends intended to kill an hippopotamus; but a violent thunder-storm, to his great disappointment, prevented his witnessing the (for him) novel sport. On the morrow, when he was departing with a warlike expedition, the traveller says he had an opportunity of convincing himself that these uncouth and stupendous animals are very sensibly affected by musical sounds, even though they should not be of the softest kind.

“As they passed along the banks of the lake Muggaby at sunrise,” he continues, “they followed the drums of the different chiefs the whole length of the water, sometimes approaching so close to the shore, that the water they spouted from their mouths reached the persons who were passing along the banks. I counted fifteen at one time sporting on the surface; and my servant Columbus shot one of them in the head, when he gave so loud a roar, as he buried himself in the lake, that all the others disappeared in an instant.”

Still deeper in the African wild, at the great lake Tchad, these quiet monsters again made their appearance to our traveller; and, on one of the large streams that empty themselves into this lake, numbers of them came so close to his canoe as to be struck with the oars or paddles. It does not appear that they attempted in any way to molest him, for his fragile bark, which one of them could have upset and crushed in an instant, performed its voyage in perfect safety.

In all this part of Africa the flesh of the hippopotamus was considered as a very great delicacy.

Captain Owen's recent voyage of survey on the coasts of Africa, Arabia, and Madagascar, brought our English sailors in frequent contact with this huge animal, which, if its sagacity and courage at

all equalled its strength and invulnerability, would prove one of the most formidable opponents to be encountered in the animal kingdom.

We learn, from the interesting account just published of this dangerous voyage, that hippopotami are found in all the larger rivers on the African coast, from the Cape of Good Hope to the Straits of Babelmandel; and that, in that part of the world, wherever water is plentiful and the country uninhabited, their number is still prodigious. We derive also a satisfactory confirmation of all that we have reported, on the authority of preceding travellers, as to the habits and character of these animals.*

As soon as a boat's crew approached the mouth of the Temby river in Delagoa Bay, they saw several hippopotami, and at night, when they quitted the boat to sleep ashore in tents, their rest was disturbed by the incessant grunting of these animals. The next day the sailors succeeded in capturing a young one, which was floundering in the broad mud that skirted the river.

"In size and appearance he resembled a large, fat hog, with a young bull's head; his legs were clumsy, and out of all proportion; and his skin hairless, but very tough; he was perfectly harmless, and soon became docile, acknowledging at times the attention he received by the performance of sundry awkward gestures peculiar to himself, and by sucking whatever he could get into his mouth."[†]

In a few days, however, this poor animal began to decline for want of milk and proper nourishment, and was killed by the sailors, who found his flesh perfectly white, very tender, and in flavour like veal.

While examining a branch of this same river, a

* 'Narrative of Voyages to explore the Shores of Africa, under Captain W. F. W. Owen,' vol. i. p. 88.

violent shock was suddenly felt from underneath the boat, and "in another moment a monstrous hippopotamus reared itself up from the water, and in a most ferocious and menacing attitude rushed open-mouthed at the boat, and, with one grasp of its tremendous jaws, seized and tore seven planks from her side; the creature disappeared for a few seconds, and then rose again, apparently intending to repeat the attack, but was fortunately deterred by the contents of a musket discharged in its face. The boat rapidly filled, but, as she was not more than an oar's length from the shore, they (the crew) succeeded in reaching it before she sank. Her keel, in all probability, had touched the back of the animal, which, irritating him, occasioned this furious attack, and, had he got his upper-jaw above the gunwale, the whole broadside must have been torn out. The force of the shock from beneath, previously to the attack, was so violent, that her stern was almost lifted out of the water, and Mr. Tams, the midshipman steering, was thrown overboard, but fortunately rescued before the irritated animal could seize him. The boat was hauled up on a dry spot and her repairs immediately commenced."* That night also the English seamen constantly heard the snorting of the hippopotami, and occasionally a splash, as they rushed in and out of the water pursuing their rough pastime.

In Dundas river in the same neighbourhood the only quadrupeds seen by the surveying party were crowds of hippopotami, which, when they anchored at night, kept up a constant noise until morning. Lieutenant Boteler, who commanded this party, compares their cry to the grunting of a hog, joined to the loud hollow bellowing of an ox and the neigh of a horse.

The next day, as they continued their course up

* 'Narrative of Voyages' &c. vol. i. p. 92.

the river, on passing a low sandy point, they found themselves surrounded by a group of hippopotami, which stood so close together, that, had they not sunk as the boat approached, there would have been no possibility of passing without striking them. "Three," says Lieutenant Boteler, "were standing on the bank, and as we drew near, one of them opened his huge red mouth *about three feet and a half*, and exhibited a more formidable and savage appearance than I have ever witnessed in the fiercest of the brute creation: two, on our first appearance, retreated to the water; but the third remained sufficiently long to receive on his back a volley of balls, only one of which seemed to take effect, the rest glancing off perfectly harmless. The animal, feeling himself wounded, uttered a loud and menacing cry; and then rushed furiously to the water. Frequently, at the moment we fired, one only would be visible, but immediately on the report numbers would show themselves, some perhaps only for a second, whilst others, lying in shoal water, would instantly start up and attempt to get into the deeps, trotting through the mud at a quicker rate than the boats could pull, and looking back upon us now and then with the greatest terror and anxiety. One that was penned up between the two boats appeared stupified by fear, and, without making an effort to escape, stood for upwards of five minutes, regarding first one boat, and then the other, which, from their relative situation, could not fire at him. While running through the water they dip their heads continually beneath, and with their broad noses throw it up in a shower on their backs. The quickness of these animals is extraordinary, for frequently after the flash they were down before the ball could reach them."⁴

On descending the river, and keeping to the op-

⁴ 'Narrative of Voyages,' &c., vol. i. p. 110.

posite side, they saw the same method of entrapping these animals which we have described as being in use among the natives in other parts of Africa.

They observe where the animals in their frequent passages to and from the stream break down the banks, and then place in those hollows sharp-pointed poles, hardened by fire, upon which the hippopotami often stake themselves in their hurried descents. At times when other food is scarce, and the flesh of the hippopotamus in great demand, they assemble in the woods, and, when the animals come on the plain to graze, they rush out upon them with loud cries. Thus terrified and running back to the river with blind haste, they at times almost transfix themselves on the stakes, notwithstanding the thickness and toughness of their skins. A much more ingenious trap is also used by the natives in these parts. It consists of a young tree, or part of a tree, about twenty feet high, fixed perpendicularly by the side of the passage they frequent, and of a heavy bough, whose lower extremity is armed with the iron head of an assagai, or spear: this heavy-armed bough is slightly attached to the top of the perpendicular shaft by means of some climbing plants, which act as a rope, and are in part brought down to the ground, and carried horizontally and close to the earth across the animal's path. As the hippopotami lift their huge feet but very little from the earth, this contrivance is very effective: they tread upon and break the cord, or climbing plant, upon which the bough falls like a portcullis, and generally drives the sharp end into the back. As soon as they are wounded they plunge into the river, bleeding and roaring terrifically, and there they remain in deep water until they die. The natives sometimes render the wound more certainly mortal by anointing the head of the assagai or spear with poison.

Though thus despatched, they cannot obtain the body until it floats of itself: they remain constantly on the look-out, and when it appears they tow it ashore, and feast on the horribly inflated and not unfrequently half-putrid carcase.

On another excursion on the Dundas river, when several officers and men went on shore to shoot elks and deer, a poor sailor was lost. They could not ascertain his fate, but from the number and comparative boldness of the hippopotami it appears probable he fell their victim. The next morning, a Lieutenant Owen and Mr. Foote, a young midshipman, were going to land from a boat, to renew their search after the man missing, they were suddenly startled by the loud roaring of a beast on the river bank, and the next instant saw a very large hippopotamus dash into the water, and make towards them open-mouthed. The only gun in the boat was Mr. Foote's, and happened at the moment to be loaded only with powder; that youth, however, nowise daunted, let the monster approach within a few feet, when he discharged the musket full in its face. The animal then went round the boat, keeping at the distance of some twenty or thirty yards, but in a short time, to their surprise, it renewed the attack: in the mean time, Mr. Foote had loaded with his last blank cartridge, and, coolly waiting until the monstrous head of the hippopotamus was almost within the boat, he again fired in its face, which induced a final retreat.

It is observed in the narrative of these voyages that this was the only time any of Captain Owen's party, who, as we have before observed, had very frequent encounters with them, ever met with an hippopotamus that would meet a second fire.

The night after receiving this specimen of the ferocity of which the animal is at certain seasons

capable these hardy sailors^s passed in their open boat, which was grounded a good part of the time. They had not so much as a single charge of powder left—their only resource was in their shouts. They were surrounded by hippopotami, whose huge bodies, increased fourfold by the uncertain light and their apprehensions, were seen frequently rushing from the long grass and the weeds on the banks close to them. No accident, however, happened. This appeared to Captain Owen and his officers to have been the season in which the females bring forth their young, a circumstance that may account for the hippopotami being so much fiercer than usual.

To the same circumstance may be also attributed the frequent appearance of the animals; for, as their young cannot suck under water, the mother is frequently obliged to seek the covert of the reeds and jungle along the water's edge in order to allow her offspring the opportunity.

Dampier describes an animal found in the woods adjacent to the larger rivers of South America which is called *ante* by the Spaniards, and which some naturalists were inclined to regard as identical with the hippopotamus, misled no doubt in a great measure by its aquatic propensities. Though the description given by Dampier is not very precise, there can be no hesitation in referring the animal to the tapir, or *d'anta*, an animal with which we are now well acquainted, and of which several individuals have lived in the gardens of the Zoological Society. It is true that Dampier talks about the eyes being round, full, and of a prodigious size (whereas they are small); and also states that the nose is short, and the head round and compact; but it should be remembered that inaccuracy was formerly the characteristic of descriptions of natural objects: blinded by the novelty of animals with which they were un-

familiar, and giving loose to the imagination, which is too liable to magnify and distort, the older travellers have mingled falsehood and truth together in the most extraordinary manner. Hence their accounts are to be received with much allowance. With regard to the present subject, it may be stated as a fact that the hippopotamus is, at the present period, confined exclusively to Africa, and, moreover, that the tapir is the only living huge pachydermatous animal indigenous in America.

The hippopotamus is regarded by most commentators as the behemoth of the Scripture (see the book of Job, ch. xl.), and several expressions tend to confirm this idea. "The shady trees compass him with their shadow, the willows of the brook compass him about." "He eateth grass as an ox." "He trusteth he can draw up Jordan into his mouth: his nose pierceth through snares."

Four fossil species of hippopotami are described by Cuvier in his celebrated work "*Sur les Ossemens Fossiles*," distinguished under the titles of Hippopotame grande (*H. antiquus*, Desm.), *H. petit* (*H. minor*, Desm.), *H. moyen* (*H. medius*, Desm.), and *H. très petit* (*H. minimus*, Desm.). The fossil relics of the first species (*H. antiquus*) are widely distributed: they are particularly abundant in the Val d'Arno, Italy, intermixed with those of the elephant and rhinoceros; and have been found in France, near Montpellier, and also near Paris. In England the tusks and grinders have been found near Brentford, with bones of elephants, rhinoceroses, and deer. (See Philosophical Transactions, 1813.)

"It cannot be doubted," says Cuvier, "but that the relics of hippopotami exist in a fossil state in most of the places where exist the relics of elephants, rhinoceroses, and deer; but it is singular that the only district where they have been discovered in an

abundance proportionate to that of the other genera should be in the Val d'Arno Superior." They occur in the hills of sand which form the first steps of the mountains which surround this beautiful vale.

The general resemblance between the bones of the great fossil hippopotamus and those of the living species is more close than it is between those of the fossil elephants, or fossil rhinoceroses, and the bones of extant species. Still, however, the differential characters are sufficiently decided to warrant the conclusion as to a specific distinction between the fossil and the living animals.

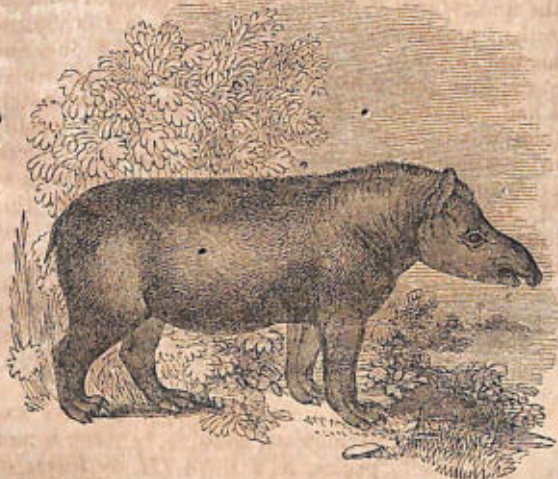
The small hippopotamus (*H. minor*) was discovered by Cuvier in so curious a manner that we cannot do better than translate his own account. "The mass of stone from which I have acquired this species was for a long time in one of the store-rooms of the museum, and no one had any knowledge as to the place whence it was originally brought. I was struck, however, by the quantity of fragments of bones and teeth with which it was larded (lardé) in every part. It was not unlike the osseous breccias of Gibraltar, Dalmatia, and Cette, except that the matrix (pâte), instead of being calcareous and stalactitic, was a sort of freestone (grès) with a calcareous base, filling uniformly all the intervals between the bones; and that in an incomparably greater portion of the mass than in these breccias. Examined by M. Brongniart, it was found to be composed of more than two-thirds of carbonate of lime. In thirty parts there were nine of sand mixed with a little clay. It cost me, as well as my assistants, a considerable time and great patience to disengage a part of these bones from the stone which encrusted them: we employed to this end for many days the chisel, the file, and the graver: we were obliged to sacrifice many bones in order to preserve others

entire ; but how well did we find ourselves recompensed for our trouble when we had brought to light the relics of an animal of which no one before us had the least idea. I was a long time afterwards without again seeing stone like this first, not indeed till March, 1803, when, being at Bordeaux, I visited the fine cabinet of natural history which M. Journu-Aubert possessed, and which he gave as a present to his native town. I there saw a block of stone, and at the first glance knew it to be similar to that which I had broken up at the museum, but unfortunately there was here also no indication as to the locality from which it had been brought, and M. Villiers, professor of natural history at Bordeaux, as well as M. Journu-Aubert himself, who was then in this town, were neither of them able to give me any information. Since then M. Journu-Aubert has generously presented this valuable specimen to our museum, and enabled me to complete the knowledge of this remarkable species by the addition of other bones to those which the first block had afforded me."

In size this species does not appear to have exceeded a hog: intermediate, however, between it and the first fossil species, is a third (*H. medius*), of which relics have been found in France. The fourth species (*H. minimus*) is known only by its teeth, which have been found with the teeth of crocodiles at a depth of twenty feet in a calcareous deposit near Blaye. In size this animal was less than the hog; Cuvier, however, throws some degree of doubt as to whether the animal belonged to the present genus or not, for it appears that some trenchant incisor teeth were also found, but whether belonging to a jaw in which the molars were rooted or not yet remains to be ascertained.

CHAPTER, III.

TAPIR.

*American Tapir.**(From Specimen in Zoological Society's Museum.)*

IN looking over the genera composing the order pachydermata, we cannot fail to be struck with the circumstance that, as far as extant species are concerned, America seems strangely deficient. This vast continent, the stronghold of the rodent order, has only one *pachydermatous* genus exclusively peculiar to it, namely, *dicotyles*, which includes two ascertained species of peccary, animals closely allied to the hog, but nevertheless exhibiting decided dis-

tinctive characteristics." Beyond this we find another genus divided between America and the peninsula of Malacca, with the island of Sumatra, namely, the genus *Tapirus*, Briss., of which three species are known, two being peculiar to the New World, and one to the Indian localities before mentioned. All other extant *pachydermatous* genera yet known, as *Elephas*, *Rhinoceros*, *Hippopotamus*, *Equus*, *Sus*, *Babirussa*, and *Hyrax*, are indigenous in the older continents. There is abundant room for speculation on the present paucity of living *pachydermata* in America, the more so as the superficial strata in various parts of that continent present us with the relics of several *pachydermata*, some of colossal magnitude, among which we may notice those of an extinct *elephant*, and of the gigantic *mastodon*, with allied species, viz., the *Mastodon Cordillerarum* discovered by Humboldt in Quito, at 1,200 feet above the level of the sea, *Mastodon Humboldtii*, and *M. tapiroides*. Very recently the fossil cranium of a huge animal, belonging apparently to this order, has been brought to England by Mr. C. Darwin, from South America, and has received the name of *Toxodon*. Why it is that a series of animals of the *pachydermatous* type which existed at a very late geological period should have passed away, and that in the present era so few should appear as their representatives in the regions they tenanted, is a problem not easy of solution. The fact, however, is incontestable, that we there find but two forms of this order now extant, viz., that of the genus *tapiurus*, (of which, as we have said, America possesses two species, animals of only second-rate magnitude,) and that of the genus *dicotyles* (of which the two known species are inferior to the hog).

The peculiarities of the genus *tapiurus*, then, independent of its distinctive characters, consist in the

curious distribution of its species—a distribution exhibited by no other genus of the order. It is true that the *horse* is wild on the Pampas: but the *horse* (and the same observation applies to the *hog*) is not an aboriginal of America; it is of recent introduction, the circumstances attending which are well known. We have then, in the case of the tapirs, the sole example of a pachydermatous genus giving *one* species to a limited portion of the Old World, (viz., Malacca and Sumatra,) and *two* to the woods of South America. In this point of view the tapirs are peculiarly interesting; but not only on this ground—their structure, habits, and manners recommend them to our attention. In searching for near affinities to them among now existing forms, though we cannot overlook their resemblance to the hog, at least as to general contour of body, we find none in immediate alliance with them,—the discoveries of Cuvier, however, have made us acquainted with fossil forms, proving the existence of some early epoch of animals far more nearly allied to them than any living species. We allude to the genera *palæotherium* and *lophiodon*, each containing several species, the relics of which have been discovered in the plaster quarries near Paris, and in other places in France. Of the genus *palæotherium*, says Cuvier, “eleven or twelve species are already known. At Paris alone have been discovered some of the size of a horse, some of the size of a tapir, and some of that of a small sheep: near Orleans are found the bones of a species which nearly equalled the rhinoceros. These animals appear to have frequented the borders of lakes and morasses, for the stony matter which invests their bones contains also fresh water shells.” It is with these relics that the bones of ten or twelve species of *lophiodon* occur also, mingled with those of the *anoplotherium*, an animal which while it exhibits

(as far as can now be determined) a relationship to several of the *pachydermata*, approaches in some degree the order *ruminantia*.

In one point, and that of no little zoological importance, the *palæotheria* and *lophiodons* closely resembled the tapirs: we allude to the possession of a short but flexible proboscis. A peculiar mobility of the upper lip, connected with a more or less marked development of it, is seen in all the *pachydermata* (the hyrax excepted, which in many points closely resembles a rodent); but in none is this development carried to such an extreme as in the elephant: here we find the nasal tubes continued to the extremity of a cylindrical flexible organ termed proboscis. Next to the elephant, though still at a considerable distance, comes the tapir. In these animals we find the proboscis short, but flexible, and capable of considerable extension. As in the case of the elephant, the tapir uses it as an organ of prehension, but by no means to so great an extent; nor, as in that gigantic beast, is it employed as an organ of suction, or as a pump. The muscular *fasciculi*, however, with which it is formed are similar to those composing the proboscis of the elephant, and there are also strong *levator* muscles, rendering this elongated snout well adapted for the purpose of searching in the ground for roots. The proboscis of the elephant, depending from an elevated forehead, gives a grave and even imposing air to the animal's physiognomy: the flexible snout of the tapir, on the contrary, terminating a head shaped much like that of a hog, but more compressed, and elevated into a ridge above, produces no such impression; it is neither terrific as a weapon, nor does it so well fulfil the place of a hand and arm. Yet is it extremely useful as an organ of prehension, by means of which the animal assists itself in the procuring and appropriation of its food.

In addition to the characters afforded by the proboscis, may be observed that the eyes are small but quick, the ears pointed, the neck compressed laterally, and rising boldly from the occiput in the form of a thick arched ridge, formed by the *ligamentum oruchæ*, here of great magnitude, and the index of vast power.

The hair is short, and the general contour hog-like. The feet are divided into four toes before, of which the outer one is very small, and three behind, each encased in a hoof: the dentition consists of six incisors on each jaw: the canines are small, and placed one on each side above and below, separated from the molars by a considerable interval. The molars are seven on each side above and six below, and, until worn down by attrition, the crowns present two transverse ridges. The tail is a mere tubercle. We shall first direct our attention to the common American species (*Tapirus Americanus*). It is of this species alone that living specimens have been exhibited in Europe: hence are its manners and disposition far better known than those either of its American or its Asiatic relative.

Azara, in his 'Essay on the Quadrupeds of Paraguay' (vol. i. p. 1), terms it the *Mborebi*, observing, "It is thus that the Guaranis call this animal, which the Spaniards name 'Great beast,' and the Portuguese of Brazil '*Anta*.' The species is not," he adds, "numerous here. The *Mborebi* wanders generally alone or in pairs. During the day it sleeps concealed in the most dense and gloomy retreats, and during the night it wanders about the neighbourhood in quest of water-melons, gourds, and other food. When taken young it becomes tame from the very beginning, and goes about the premises without straying away even after it becomes adult. Every one may touch or scratch it, not, however, that it prefers any one or obeys

particular individuals: if one wishes to make it go from any place, it is necessary almost to pull it along. It never bites; and if it be molested, it utters a shrill whistling cry very disproportioned to what might be expected from its bulk. It drinks like a hog, eats flesh, raw or cooked food of every kind, and all which falls in its way, without even excepting rags of wool, linen, or silk. I have often seen it gnaw my stick, and on one occasion it did the same with a silver box filled with snuff: so that it would seem to be more voracious than the hog, while its powers of taste do not enable it to distinguish one thing from another. It also eats the *barrero*, or nitrous earth, of which I have found large quantities in the stomach of one of these animals. It may be easily imagined that the domestication of an animal so troublesome, so dull, so destitute of attractiveness, and of which the only quality is that it requires neither attention nor care, involves no amusement. The female mborebi brings forth her young in the month of November; she leads it about and directs it without assistance from the male, but she affords it but little protection, because this animal has not the means: nevertheless it is related that, being reduced to extremity, and prevented from flight, it strikes with its feet, and seizes the dogs by the spine with its teeth, and then raising them up and shaking them, it tears away the skin. It is also related, that if the jaguar throws itself upon the mborebi, the beast drags its foe across the most dense parts of the forest until it has severely bruised it, by forcing it through the narrowest places: in fact this animal seeks neither paths nor roads in which to fly, but it tears asunder, it separates, it rends every obstacle with its head, which it always carries very low: it flies from every danger, forewarned of its approach, and this foresight is the result of the admirable powers of vision with

which it is endowed for dusk, and of the fine sense of hearing which it also possesses."

The mborebi is chased with dogs : it is also way-laid in the fields of water-melons during the night, and if at dawn of day the mounted hunters find it in the open country, they take it by means of the lasso ; for, although this animal is more rapid than its form would indicate, it is easily overtaken by a horse if met with at some distance from the woods or the morasses. If struck with a musket-ball, it does not fall upon the spot before the hunter, and I have seen one which had the heart pierced by two balls run on for two hundred paces. The free Indians eat the flesh of the mborebi, but this does not prove that it is delicate. This animal is very robust, and as it is found in woods, on dry lands as well as in marshy places, and as it frequents the "*esters*," or flooded tracts near rivers or the sea, it would appear that every situation is alike, provided that it affords the means of concealment, for it is not found in the open plains except when the daybreak has surprised it there. It swims and traverses with ease the largest rivers, the "*esters*" and lakes, without diving beneath the surface, and it throws itself in when wounded or pursued.

The eye of the tapir, as Azara observes, is small and deep set, but very brilliant during the night. "The head resembles that of no other known animal, inasmuch as its upper portion terminates in a lip in the fashion of a thick proboscis, advancing more than two inches and a half, and moveable in every direction. This trunk is capable of contraction to half, or of dilatation to double its ordinary size, in order to seize objects, or carry food to the mouth, as well as to govern the act of smelling, for at its lip are two horizontal nostrils, fifteen

lines in length, which the animal is constantly opening or closing at will.

"The skin is thicker than that of the bull; the hair, except that of the mane, is extremely short, close, smooth, and of a deep dusky brown, except under the head, under the throat, and at the tips of the ears, where it is whitish."

Such is the substance of Azara's account of the tapir. To this, however, he adds a severe critique on Buffon's description, both of its form and habits. Buffon's account of its size is perhaps somewhat exaggerated—he states it to be that of a small cow, which is indefinite. Buffon may also be wrong in supposing the tapir to live in troops; but we are inclined to agree with this great naturalist in many points which Azara contradicts.

"Buffon," observes Azara, "says that this animal flies the vicinity of inhabited places; whereas it is frequently met with in such localities, although less so than formerly, at a time when it experienced no persecution." This last observation of Azara seems an admission of the fact, rather than a contradiction. Again, "he (Buffon) makes it dive in the water, whilst here we are assured to the contrary. He supposes it terrible and dangerous in the water, because, when wounded, it has overturned canoes; which last assertion is not truth, or if such a thing has happened, it was a pure accident. He also says, one ought to avoid meeting the mborebi in the forests; whereas there is under such circumstances no more risk than in meeting an ass during its flight, and which can only do injury when a person stands by accident in its way." Again, Buffon says that "the mborebi prefers the neighbourhood of rivers and of lakes, but I have already affirmed that such is not the case." Again, Buffon gives the authority

of M. de la Borde, physician to the king, and naturalist at Cayenne, as to the circumstance of hunters drawing it near them* by imitating its voice, which, as it makes no other sound than a whistling noise expressive of pain, Azara regards to be unworthy of credit. Seeing, then, that Azara, who was acquainted with the tapir in a state of nature, and that Buffon who, though he was personally unacquainted with this animal when he collected the details of its history, yet drew his accounts from persons, who, it must be presumed, were as conversant with it as Azara, are thus at variance, it may not be out of place to introduce a few observations made some time since by ourselves on the two fine specimens lately living in the gardens of the Zoological Society, and that too before we had examined the accounts of either party.

The two beautiful tapirs from South America, which are now in the gardens of the Zoological Society,* have been there about six years, and their age is supposed to be between ten and eleven; both are females, their height at the shoulders is fully three feet; their length, from the snout to the end of the spinal column, six feet two inches. The body is heavy and massive, the shoulders muscular, the limbs short and strong; and their whole contour betokens great strength, not uncombined with a degree of clumsy activity. The eyes, though small, are quick and intelligent. In their general deportment they are peaceful and unobtrusive: they neither display timidity nor curiosity; but are immediately lured by the offer of food, to obtain which they will come to the bars, and poke out their long moveable noses, by way of soliciting a morsel. They are fond of being scratched or rubbed, like the hog, and

* Since writing the above both animals have unfortunately died.

testify their pleasure by a whistling kind of noise. They sleep the greater portion of the four and twenty hours of the day, and always during the night. It is in the morning that they are the most lively, probably because they then feel "the keen effects of appetite:" we must not however judge precipitately of the habits of animals in their native freedom by what we observe of them in captivity. Night, according to the best accounts, is the most active period with the tapir in its natural condition.

Though these creatures, as we have said, are usually quiet and peaceful, they sometimes break out in fits of irritation, and plunge about, lunging violently with their heads and snapping with the teeth like a hog. In these moods it is unsafe to venture within their reach, for they are quick in their actions, and their strength, in proportion to their size, is as great as that of the rhinoceros; so that when rushing forwards, which they will do with considerable velocity, they bear down every moveable obstacle in their way. They agree, however, very well together; at least, when the space in which they are confined is sufficiently large to allow them to act as they please without interfering with one another.

Few pachydermatous mammalia, the hippopotamus excepted, appear to be so decidedly aquatic in their propensities as the tapir. With this animal water is not only a luxury, but almost, it would seem, a necessary. It is highly amusing to see how the two individuals in question, when the season permits it, will revel in the enjoyment of their bath. They plunge in, swim and flounder about, and often totally immerse themselves, *continuing unseen at the bottom for at least a couple of minutes*: they then rise to the surface, and elevate their snout for the purpose of breathing; again swim about, and again disappear beneath the surface. They are, in fact, at home

in the water; and it is very evident that, like the hippopotamus, they not only seek refuge in the lake or river, but have the power of diving to the bottom, and, perhaps also, of traversing it, so as to avoid pursuit or observation. It is remarkable that they always go to their tank to dung, and in summer usually do so while beneath the water; a circumstance which renders it necessary to clean out the tank and change the water frequently.

Of all extant *pachydermata*, the tapir approaches most nearly to the elephant in the proboscis-like structure of its elongated nose, which it uses with singular address. If any article of food be offered to one of these animals in the Zoological Gardens, it will be seen how cleverly they hook it towards their mouth, and with what facility they can twist their snout in various directions, and extend or contract it at pleasure. This instrument they ordinarily use in the collecting of their food, such as roots, twigs, and other vegetable matters, which they draw to the mouth, hooking them in it with the utmost dexterity.

The diet of the individuals at the Zoological Gardens consists of five pounds of sailors' biscuit each per diem, with a portion of green vegetables and a little hay; and each, in the same space of time, consumes about three gallons of water.

The whole appearance of the tapir is decidedly hoglike, and the intelligence which our individuals display is of the same character and grade as is exhibited in that well-known beast. Patient of confinement, to eat and drink and be satisfied makes up their round of happiness: no longing for the freedom of the forest, no pining for liberty, disturbs their quiet repose. They are in fact personifications of inoffensive sensuality. The motion of the jaws in eating differs considerably from that observable in the horse or elephant, which grind their food, the former

by a lateral motion of the lower jaw,—the latter by a motion backwards and forwards, so as to make the grinders rub upon each other; but the tapir *champs* its food by a quick opening and shutting motion of the lower jaw, so that the vegetable matters on which it subsists are chopped or minced by the transverse conical ridges of the grinders.

It will be seen from the following extract from M. de la Borde's account, as given in Buffon (Sup. vi. p. 2), that many of the peculiarities observed in the living specimens above referred to have been noticed by that writer:—

“These animals,” he says, “avoid the neighbourhood of inhabited places, and take up their abode in the environs of marshes and rivers, which they often cross during the day and also at night. The female is followed by her young, and accustoms it at an early period to enter the water, where it plunges and plays before its parent, who seems to enact the part of instructress in this exercise. The male parent takes no share in this work, for the males are always found solitary, except at certain seasons, when they accompany the female.”

In another part he repeats the same observations, adding, that the care which the female takes of her young one is no less remarkable on land. “She makes it continually accompany or follow her, and if the little one lingers behind, she turns her snout from time to time to smell out if it follow, or if it wander too far, in which latter case she calls for it, and waits until it be ready to continue the march with her.”

Notwithstanding Azara's assertion that the tapir is destitute of the means of resistance, and therefore perfectly inoffensive, our own observations lead us to agree with M. de la Borde, who, after stating that the animal is numerous in the interior of Guiana,

says, "When chased, they take refuge in the water, whence it is not easy to draw them out; but, although they are of a gentle and quiet disposition, they become dangerous when wounded. They have been seen to throw themselves on the canoe whence the injury came, and endeavour, by overturning it, to take revenge. It is requisite also for persons to beware of them in the forests; they there make paths, or rather beaten tracks, of tolerable breadth, by repeatedly going to and fro (for they are in the habit of passing and repassing always in the same places); and these paths, from which the animals never turn aside, are to be avoided, for they move briskly on, and, without intending mischief, they dash violently against every obstacle in their course. The districts bordering the upper parts of the rivers in Guiana are inhabited by a considerable number of tapirs, and the banks of the waters are intersected by paths which they wear; and so beaten are they, that the most desert places appear, at first sight, as if peopled and frequented by human beings. Furthermore, dogs are trained to hunt these animals on the land and follow them into the water, but as they have the skin very hard and very thick, it is rarely that they are killed at the first shot." The foot note (p. 3) gives the following anecdote:—

"A traveller informed me that he had nearly fallen a victim to his want of experience respecting their beaten tracks.—On his travels in the country he had attached his hammock to two trees, in which to pass the night; it happened, however, that his hammock passed across one of these beaten ways. About ten o'clock in the evening he heard a loud noise in the forest; it was occasioned by a tapir on his route: he had just time to throw himself out of his hammock and stand close against a tree; the animal did not stop, but tossed the hammock into

the branches and bruised him as he stood : then, without turning aside from its path, it passed in the midst of some negroes who were sleeping on the ground near a large fire, without doing them any injury."

At Cayenne the tapir is sometimes domesticated, and is harmless and quiet ; with those who caress it, it becomes familiar ; indeed it often proves troublesome, as may be imagined would be the case with a pet hog under similar circumstances. " Sometimes they wander during the day in the woods, and return home in the evening, nevertheless, however, they often abuse the freedom thus permitted to them, and absent themselves entirely." M. Bajon brought up one of these animals, which testified great attachment for him, and would distinguish him at once in the midst of a number of persons ; it followed him like a dog, and returned his notice by licking his hands ; it was accustomed to go alone in the woods, and would often wander to great distances, but never failed to return early every evening.

The first instance of a living tapir being exhibited in Europe occurred in the year 1704, and is thus noticed by Professor Allamand :—" Although tapirs are common enough in the districts of South America colonised by Europeans, and are sometimes seen on the premises of individuals, where they are brought up with other domestic animals, it is, nevertheless, very seldom that they are transported to Europe. I do not believe that until the present time more than one has been seen, which was exhibited at Amsterdam in 1704, under the name of sea-horse (*cheval marin*), and of which a painter of the day made drawings which are preserved in the collections of some virtuoso (*curieux*), but which represent this animal so imperfectly that it cannot be recognised." Subsequently, however, as M. Allamand

observes, two of these animals were carried from town to town through Holland; and Buffon, in a note, states, that although he had not seen the tapir when Allamand wrote, he had since had the opportunity, and had caused a drawing of it to be made from nature.—(See pl. 1. Supp. vi. p. 16.) We can find no notice of the existence of a living tapir in England until 1828. It was in this year that Lieutenant Maw, R.N., presented to the Zoological Society a young tapir, which he bought at Para in the Brazils, and which was perfectly tame. Unfortunately it died soon after its arrival at the gardens. An account of its anatomical structure, by Mr. W. Yarrell, appeared in the 14th Number of the Zoological Journal, to which we refer our readers. Like the rhinoceros and horse, &c., it had no gall-bladder. During his travels in South America, Lieutenant Maw had many opportunities of gaining information with regard to the habits and manners of this animal; and his details are the more valuable, inasmuch as, not being a professed naturalist, he did not enter into the discrepancies between the accounts of Azara and Buffon, but wrote as he saw, or according to information derived from the natives. "We had," says he, "an account given us of an animal common in the wood and rivers about Egas. This was the tapir; there called the anta, and which is the same animal with the sacywaka dante, or gran bestia, of Peru, and of which we had heard much, both before and since embarking. . . . When young it is striped and spotted like a deer,* but as it grows older the spots disappear, and it becomes entirely of a dusky bay colour. . . . It feeds upon herbs and the branches of trees, and goes much into the water, walking along, or rather across, the bottoms of rivers. It possesses

* A stuffed specimen of a young tapir, marked as described, is in the museum of the Zoological Society.



Young Tapir.

great strength, particularly in the fore part of the body, but is harmless except when attacked. It is said to pass directly through the thickets without following any previous track. We were told that when the tapir is attacked by a tiger (jaguar), it generally springs upon the tapir's back, when the latter rushes into the woods and endeavours to kill the assailant by dashing him against some large tree. Although strongly and apparently heavily made, the tapir is said to be fleet." When full grown, the tapir measures upwards of five feet in length, and the female is said to exceed the male, at least if Azara be correct; for on this point he and M. Bajon are at issue, as on many others. Our own opinion concurs with that of M. Bajon; but as we have only seen females in a living state, it is founded, not on observation, but on analogy. There is not one of the other *Pachydermata* of which the male does not exceed the female; and if the reverse be the case in the present animal, the exception will be solitary and unexpected.

Our knowledge of the second species of tapir

peculiar to America (*Tapirus Roulinii*, FISCHE) is due to M. Roulin, who discovered it in the Cordilleras, and laid a figure and description of it before the French Academy. In many of its osteological characters this species approaches nearer to its Indian than it does to its Asiatic congener. The occiput is not prominent, as in the common American tapir, nor does the neck rise with the bold arched ridge so characteristic of that species; the nasal bones are large and elongated, the whole body is covered with a vest of dense hairs, of a brownish-black colour, deeper at the tips; on each side of the haunch is a large naked spot, and longitudinal naked marks indicate the division of the toes; a white spot occupies the chin and runs to the angle of the lips. The general habits of this species resemble those of the *Tapirus Americanus*, but as yet we have much to learn respecting it. It is confined to the higher ranges of the Andes, and is therefore far more circumscribed in the extent of its habitat than the common species, which, although most common within the tropics, is very widely distributed, being found in every part of South America to the east of the Andes, from the Straits of Magellan to the Isthmus of Darien. M. Roulin observes that "the *Tapirus Americanus* occurs as low as 40° to the south of the equator, ceasing suddenly at about 8° north, in a situation where it is extremely abundant, and where no adequate cause has yet been assigned to bar its farther progress, no large rivers nor lofty mountains intervening, nor any change in the character of the country being manifest." We learn also that "the left bank of the Atrato, near its mouth, and the part of the Darien inhabited by the independent Indians, may be considered as its northern limit: its highest range, in the province of Maraquita, at least, appears to be from three

thousand to three thousand six hundred feet above the level of the sea, while the new species discovered by M. Roulin is met with at a much greater elevation."

We shall now pass from America to India, and consider the species peculiar to Malacca and the Island of Sumatra.



Indian Tapir. (From specimen in Zoological Society's Museum.)

Our first accurate knowledge of the Indian tapir (*Tapirus Indicus*, FARQUHAR) is due to Major Farquhar, who in the year 1816 laid a full description of the animal, accompanied by a figure of it, and also of the skull, before the Asiatic Society. It is to be observed, however, that in 1805 the late Sir Stamford Raffles had gained information as to the existence of such an animal, and received some

accounts respecting it. It will be seen that he attributes the introduction of it to science as due to Major Farquhar, and not to MM. Diard and Duvaucel, for whom the French have endeavoured to claim the merit of its discovery.

In a letter to Mr. Marsden, Sir Stamford Raffles recounts the following particulars. On his arrival at Penang in 1805 he was informed that, a short time before, in the government of Sir George Leith, the natives had caught an animal which was in every respect the model of an elephant, only of diminutive size. Unfortunately the animal was brought from Queda to Penang, during the Governor's absence, and dying before his return, the servants threw its body into the sea. On a subsequent visit made by Sir Stamford to Malacca, he made particular inquiries as to this new animal, and from the answers he received, he felt little doubt that it was not a miniature elephant, but a tapir. Indeed, on showing the natives a drawing of the American tapir, they seemed at once to recognise it.

In his letter, which is dated Calcutta, Dec. 10th, 1818, Sir Stamford says,—

“The result of further inquiries has been conclusive on this head; and I now have the satisfaction to assure you, that the animal exists not only on the peninsula, but in Sumatra. The head of one obtained at Malacca is now deposited in the Museum of the Asiatic Society at Calcutta; and a living tapir, from Sumatra, is now in the Governor-General's park at Barrackpoore. By the hands of Mr. Holton I send you a correct drawing of the Sumatran animal. It is the most docile creature I ever met with, and is more like the hog, than any other animal to which I can compare it.”

Before the receipt of this letter, an account of the discovery had been published in France. Sir Stamford

Raffles, in a second letter to Mr. Marsden, dated Bencoolen, March 14th, 1820, thus explains this circumstance:—

“With respect to the tapir, I am not surprised that an account was first published in France. Major Farquhar had sent a stuffed specimen and a head to the Asiatic Society, with a paper descriptive of the animal, and giving an account of the discovery. About the same time a living animal was sent from Bencoolen to the menagerie at Calcutta. It was from the examination of these in Calcutta that the Frenchmen prepared their accounts, and the omission on our part is attributable in a great measure to the dilatoriness in the publications of our Asiatic Society.

“The flesh of the Indian tapir, like that of the American tapir, is said to be so dry and disagreeable to the taste, as to render the animal of slight value as a source of food, but its large and tough skin might be applied to many useful purposes, and, being at once so docile and so powerful, the animal might probably be advantageously employed in the service of man as a beast of draught or burden.”

We learn from Major Farquhar that this species is common in many of the forests in the Malay peninsula, and more particularly so in the vicinity of Malacca, where it is as well known to the natives as the elephant or the rhinoceros. In its disposition, according to the same authority, it resembles its American relative, being gentle, timid, and harmless, and seemingly destitute of natural means of offence or defence. It feeds on vegetables, and is said to be very fond of sugar-cane. Though the natives have not domesticated it, he is of opinion that, were the animal taken young, it would be as easy to tame as the American tapir. Indeed, a living specimen, subsequently procured by Major F., and which lived

six months in his house, when it suddenly died, was an animal possessed of a most mild and gentle disposition. It became as tame and familiar as any of the dogs about the house—fed indiscriminately on all kinds of vegetables, and was very fond of attending at table, to receive bread, cakes, or the like. (See *Trans. Asiat. Soc.*, vol. xv, 1820.) A Sumatran tapir, procured about the same time, and presented alive to the Asiatic Society by G. J. Siddons, Esq., resident at Bencoolen, was also a most gentle animal. It was of a very lazy habit. He delighted in being rubbed or scratched, and this favour he solicited from the people about him, by throwing himself down on his side, and making sundry movements. It is distinctly stated of this Sumatran specimen, that another of his great delights was to bathe,—also, “that he remained a very considerable time under water.” The living specimen, says Sir S. Raffles, sent from Bencoolen to Bengal, “was allowed to roam occasionally in the park at Barrackpoore. The man who had the charge of it informed me that it frequently entered the pond, and appeared to walk along the bottom under the water, and not make any attempt to swim.” This characteristic habit of the animal was not observed by Major Farquhar in his Malacca specimen. That gentleman says, indeed, that he thought he might venture to affirm that the Malacca tapir is not, like the American species, amphibious in its nature. He adds, that the one he reared showed rather an antipathy to water, and that in the peninsula of Malacca these animals are found to frequent high grounds. As, however, it is admitted on all sides that the Malacca and the Sumatran tapirs are the same, and as these creatures differ in no material points of conformation from the American tapir, it is not easy to imagine that, while the American animal and that from

Sumatra are so aquatic in their habits, the animal from Malacca should be devoid of the love of water, or the faculty of remaining under it for some time. As Major Farquhar's specimen soon died, it is, perhaps, not unreasonable to suppose that its antipathy to water arose from some disease, and that death was hastened by this departure from its natural habits.

The tapir is called *tarnoh*, or *tennu* at Malacca, and seems to be much more common in that peninsula than in the island of Sumatra, or, at least, than in those parts of the coasts of Sumatra which are frequented by Europeans. The Sumatran specimen, sent to the Asiatic Society by Mr. Siddons, was given to that gentleman by the Pangeran or native judge of Bencoolen, on whose grounds it had been caught. This Pangeran was the oldest man living in that part of the island, and he assured Mr. Siddons that, in the whole course of his life, he had never seen but one other animal of the description, and that he had never heard of one having been seen since, up to the time of the present capture. The first tapir he saw when he was about ten years old, and he remembered that it was about the size of a small cow. The young one he presented to Mr. Siddons was caught in a paddy-plantation. His people were attracted by the shrill cry of the animal, which they found at the edge of the paddy-ground, close to a thicket, amidst very long grass. An immediate search was made for its parents, but no traces of them were found. This young animal was very fond of boiled rice, when cool, and ate grass, leaves, &c.

The rarity, however, of the tapir in Sumatra is, we suspect, rather supposititious than real,—it inhabits the dense forests of the interior and is therefore seldom seen. It will be recollected that in the loss of the

ship *Fame*, by fire (see *Life of Sir S. Raffles*), a living tapir from Sumatra, in the possession of Sir S. Raffles, perished, and during the short period of his stay in Sumatra, after that disastrous event, he was enabled to procure other specimens, one of which is in the museum of the Zoological Society, and another in the museum of the East India Company. We learn from Sir S. Raffles that the tapir receives various names in different districts. By the people of Limun it is called *Saladarg*,—in the interior of Manna, Gindol—at Bencoolen, *Babi Ala*—and at Malacca, *Tennu*.

The Indian tapir exceeds in size its American congener, and the female is said to be larger than the male.

The specimen procured by Major Farquhar at Malacca, on the 30th of November, 1815, and which was supposed not to have quite attained its full growth, was seven feet in its extreme length, from the point of the proboscis to the tip of the tail. The proboscis measured ten inches and a half, the tail only one inch and a half. The height of the body at the shoulders was three feet two inches, at the middle of the body three feet four inches, at the rump three feet. The large body resembled in shape that of the hog; the legs were short and remarkably stout; the skin strong and coarse like that of a buffalo; the tail almost entirely destitute of hair which in other parts was short. There was no indication of mane on the neck, which is one of the respects in which it differs from the common American tapir. The most apparent and striking external difference between the eastern and western animals is, however, in colour. Instead of the uniform dusky bay hue of the American, the Indian is strangely parti-coloured. It is quite black in the proboscis, head, neck, fore-legs, and as far as the extremity of the fore-quarters—then its body becomes suddenly of a

light grey approaching to white, and so continues to about half way across the hind-quarters, when the black hue, without any softening off, or mingling of tints, again obtains and continues down the legs. The tips of the ears are white. The abruptness and contrast of the markings of this animal make it look precisely as if it were covered round the body with a white horsecloth, leaving the fore and hind-quarters exposed. A glance at the engraving will explain this singular appearance. As is the case with the American species, the young of the Indian differs in its livery from the adult animal.

Major Farquhar, describing the young tapir which he had alive in his house, informs us that until the age of four months it is black and beautifully marked with spots and stripes of a fawn-colour above, and white below. After that period it began to change colour; the spots disappeared, and at the age of six months it had become the usual colour of the adult.

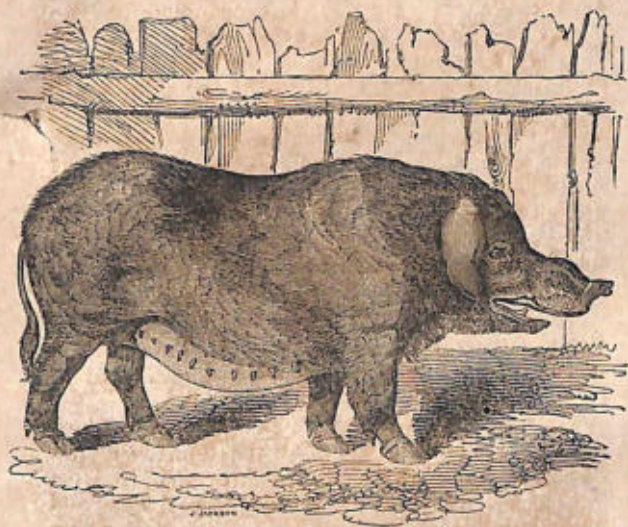
In 1821 Sir Everard Home read a paper to the Royal Society containing an account of the skeleton of the tapir of Sumatra, which had been sent to England by Sir Stamford Raffles.

The following results were ascertained and stated in the paper:—The bones of the Sumatran tapir closely resemble those of the American, but the skull of the former has a broader frontal bone and no middle ridge; the nasal bones are larger, giving a proportionate increased dimension to the nostrils. The skeleton of the tapir differs from that of the rhinoceros in the smaller extent of the scapulæ and pelvis. The stomach of the Sumatran tapir is shaped like that of the rhinoceros; the œsophagus is smooth and cuticular, and the stomach has a partial cuticular lining.

A comparison of the visceral anatomy of the Sumatran and American tapirs will be found in the proceedings of Zool. Soc. 1831, p. 161, &c.

CHAPTER IV.

THE HOG.



IN point of utility, as far as man is concerned, the hog claims precedence of every member of the pachydermatous order, excluding the horse and ass. Its value, however, is not, as it is in these animals, derived from its services as a beast of burden, but from the use of its flesh, which, in a fresh state or salted, as an article of diet, is seen alike on the tables of the rich and the poor; and the rearing and fatten-

ing of the hog, and the preparation of it when killed for public consumption, employ capital and labour in the British islands to no trifling amount. By the preparation of the flesh of this animal, we allude to its undergoing the process of salting and drying, in which state it is termed *bacon*.

Much of the value of this animal, in a commercial point of view, results from the constitutional predisposition of its race to the deposition of a layer of unctuous fat between the skin and muscles, which fat is termed *lard*, in contradistinction to *suet* or to *oil*, and to the readiness with which that unctuous fat becomes impregnated with saline particles. In this respect, indeed, it differs materially from suet, whether of the ox or sheep, and also in the proportions of its chemical constituents. In 100 parts of hog's-lard or fat, there are 38 parts of *stearin*, and 62 of *elain*. In the fat of the sheep the *stearin* is in much greater proportion, as it is also in the suet of beef, of which three-fourths consist of *stearin*: hence the suet of the sheep and ox is well adapted for various domestic purposes, and the manufacture of candles, for which the lard of the hog is useless.

As regards the deposition of fat between the skin and the muscles, the hog is not alone; the hippopotamus is also an example, and, as we have previously stated, this fat when salted is esteemed a luxury. In the bear, in the opossum, in the racoon, and other animals, a similar tendency exists; in the whale this deposit is in vast quantity, and of an oleaginous quality, filling the subcutaneous cellular tissue. In this point, indeed, the hog and the whale resemble each other more nearly than other mammalia. In the one the lard, in the other the blubber, forms a deep bed, investing the body, without intervening to any great extent, as in other fat animals, between the muscles. In most mammalia, when

very fat, this unctuous secretion is universally deposited; it separates between the muscles, it marbles their structure, and it also covers, more or less completely, their external aspect, filling up the depressions, so as to give roundness to the contour of the limbs and body. In the hog the lard does not separate between the muscles, nor does it marble their structure, but, as a distinct and continuous bed, it accumulates between the skin and the flesh; and that often to an enormous extent, the overladen beast presenting a disgusting picture of sluggish obesity. To attempt a description of the external characters of this animal would be superfluous. All are familiar with its form, its aspect, its thick, strong hide, and the coarse bristles with which it is defended. Heavy, clumsy, and powerful, it is well adapted for its destined mode of life, and many points in its structure are peculiarly interesting.

The hog (*Sus Scropha*, Linn.) belongs to the order *Pachydermata*, and forms an example of Cuvier's second family, in which the feet are divided into three, or four, or two * toes. In the hog the toes are four in number on each foot; of these the two middle are large, and furnished with strong hoofs; the two lateral, also furnished with hoofs, are shorter, and scarcely touch the ground. Viewed externally the feet of the hog, it must be confessed, closely resemble those of the ordinary ruminants, and may, indeed, be termed *cloven*, but the distinction is very great when we come to examine the bones. If we look at the foot of the sheep or antelope, we shall find that the metacarpal bones of the fore limbs, and the metatarsal bones of the posterior limbs (bones to which the toes are immediately attached), are there consolidated each into a single

* This form occurs in the fossil genus *Anoplotherium*.

elongated portion, termed the canon-bone, with an articulating extremity, like a double pulley, to which the two toes are united, and on which they work; so that the two toes of each limb have but a single metacarpal or metatarsal bone. The lateral toes in the sheep and antelope are rudimentary, without vestiges of metacarpal or metatarsal bones, though in some ruminants slight vestiges of these bones are to be discovered. If we turn to the hog we find that every toe has its own metacarpal or metatarsal bone; those of the middle toes are of course the largest, but those of the lateral toes are as perfect, so that the lateral toes in this animal, though smaller than the middle, cannot be regarded as in a rudimentary condition: they are not imperfect, not the lingering vestiges of a higher condition of structure, but complete and definite. In this sense, then, the hog is not a cloven-footed animal, nor does it militate against Cuvier's statement, that ruminating animals have all cloven hoofs, and are the only animals having them. The external similarity of the feet of the hog to those of the cloven-footed animals, and their real distinction, did not escape Buffon, though, at the same time, that celebrated philosopher was unable to discern the true affinities of this animal, and its real place in the scale of the mammalia.

"These animals" (viz., the varieties of the hog), says Buffon, "are alone; the species is, as it were, unique; it is isolated, it appears to exist more unallied than any other; it is near no species which can be regarded as principal or accessory, such as the species of horse in relation to that of the ass, or the species of the goat relatively to that of the sheep; it is not subject to a great variety of races, like that of the dog; it partakes of many species, and yet differs essentially from all. Let those who wish to reduce Nature to trifling systems, who would

inclose her immensity within the bounds of a formula, consider this animal with us, and see if it do not escape all their methods. In its limbs it has no resemblance to those which are termed *solipede*, because it has its foot divided; it does not resemble those which are called *cloven-footed*, because it has really, within, four toes, although two only appear externally; it does not resemble those which are termed *fissipede*, for it walks on two toes only, and the others are neither developed nor placed as those of the *fissipede* animals, nor ever so elongated as to be of any avail. It has these equivocal characters—characters ambiguous—of which some are apparent, others obscure. Must we say, then, that it is an error of Nature that these phalanges, these toes, which are not developed enough externally, are not such as to warrant their being taken into account? But this error is constant: besides, this animal does not resemble those with cloven feet, as respects the other bones of the foot; and it further differs by characters still more striking,—for these have horns, and want incisor teeth in the upper jaw,—they have four stomachs, they ruminates. The hog has no horns; it has incisors in the upper as well as in the under jaw; its stomach is single, it does not ruminates; it is evident, then, that this animal is neither one of the *solipede* genus, nor of the *cloven-footed*: furthermore, it is not one of the *fissipede* tribe, since it differs from these animals not only in the structure of the termination of the limbs, but more particularly in the teeth, the stomach, the intestines, &c. All that can be said is, that, in some respects, it forms a blending passage between the *solipede* and *cloven-footed* animals, and, in others, between the *cloven-footed* and the *fissipede*: it differs, however, less from the *solipede* animals than from the rest, as regards the order and number of the teeth; it re-

sembles them in the elongation of the jaws, and like them, it has a single stomach, though of a much larger size; yet in the presence of an appendix to the stomach, as well as in the arrangement of the intestines, it seems to approach the *cloven-footed* or *ruminant* group."

It is evident from this that Buffon had not very clear or definite ideas as to the affinities of the genus *Sus*: indeed, the whole of the above passage is but a paraphrase on Aristotle, who, having divided the quadrupeds into *solipede*, *cloven-footed*, and *fissiped*,^{11e} groups, observes that the "hog genus is doubtful, for in Illyria and in Pæonia, and some other places, are produced hogs with undivided (*solipede*) toes."¹¹⁻

Linnaeus placed the genus *Sus* in his order *Belluæ*,^e an order including the horse, the hippopotamus, and the tapir; but from this order he dissociated the elephant and the rhinoceros, which, with the sloth, ant-eater, manis, armadillo, and walrus, constitute his order *Bruta*. Still, however, it is manifest that the immediate affinities of the genus *Sus* were correctly appreciated by this great naturalist, who, unlike Buffon, regarded *system* as essential in the study of Nature, without which, indeed, all attempts to investigate, to distinguish, and understand natural bodies must be not only laborious in the extreme, but after all crude and unsatisfactory.

The circumstance noticed by Aristotle of hogs with undivided toes, or rather with hoofs consolidated together, is curious, but it proves nothing in favour of his views. Accidental malformations are often transmitted through successive generations, and even breeds or varieties may thus be perpetuated. Linnaeus informs us that a variety of the hog similar to that noticed by Aristotle is not unfrequent in the neighbourhood of Upsal in Sweden. In the Proceedings of the Zoological Society for 1833, p. 16, a

notice will be found of a race of pigs with only two legs, the hinder extremities being entirely wanting. The communication, with drawings of two individuals, was made by Colonel Hallam, who states that the individuals were observed "at a town on the coast in the Tanjore country in the year 1795; they were from a father and mother of a similar make, and the pigs bred from them were the same."

Passing from a consideration of the characters and structure of the feet in the hog, we shall next notice the skull, which, as Sir C. Bell has well observed, affords us an index of the habits of the animal, with which, as well as with the symmetry and proportions of the body, it admirably harmonises. The skull of the hog may be described as conical or wedge like; the base, or occipital portion, forms a right angle with the obliquely rising upper surface, and a bold transverse ridge is formed by the union of the occipital to the parietal bones, which latter advance above the frontal bones, and form the most elevated portion of the skull. The nasal bones are prolonged to the end of the snout, which in the living animal is truncate with a moveable cartilaginous disc, having a free edge, and pierced by the nasal apertures. The lower jaw is of great strength, and firmly consolidated at its symphysis or anterior angle. The dentition is as follows:—

UPPER JAW.—*Incisors*, six. Of these the two middle incline obliquely towards each other: the next incisor on each side leans towards its predecessor; the next is removed to some distance, and has but a trifling if any inclination forwards. The *canines* are prismatic, pointed, and curved upwards with a sudden sweep: their anterior surface is worn by the action of the huge canines of the lower jaw.

The *grinders* are seven on each side; the anterior

are more or less compressed; the posterior three are oblong, with turberculated crowns.

LOWER JAW.—*Incisors*, six; long, cylindrical, blunt at the point, advancing obliquely forwards, so that they almost form a right angle with those of the upper jaw, which they do not meet directly point opposed to point, but with an oblique bearing.

The *canines* are very large and strong, and advance before those of the upper jaw, against which they wear: these tusks grow during life, or at least to a very advanced period of existence: they sometimes attain to the length of eight or ten inches, and are most formidable weapons.

The *molars* on each side are six in number, resembling in character those of the upper jaw.

In the female the tusks are comparatively small.

In proportion to the elevation of the occipital ridge is the length and strength of the spinous processes of the dorsal *vertebræ*. Those in the hog are remarkable for their development, and indicate the volume of the muscles for supporting and moving the head. The neck is short and thick, the body massive, the limbs short and powerful.

The hog is destined to obtain his natural food, which consists of roots, by digging or ploughing up the ground. Hence the elongated conical form of the snout, and the moveable cartilaginous disc with which it is terminated; and hence the voluminous muscles attached to the occipital bone, forming the upper ridge of his brawny neck. The tusks of the hog are weapons of offence: rushing on his antagonist, he strikes obliquely upwards, right and left, with irresistible violence—a mode of action best calculated for bringing the tusks into effective play, according to their direction, a direction harmonising with that in which the animal best exerts his strength.

With the shortness of the neck of the hog is necessarily connected that of the limbs, and especially of the anterior pair, otherwise the animal could not reach the ground with its snout: their strength must be in proportion to the weight to be sustained, and the weight depends upon the size of the head and the muscular development of the neck and shoulders. Sir Charles Bell has adverted to these points in his Treatise on the Hand, with his usual felicity. "When we look upon the boar's head we comprehend something of his habits, and see what must be the direction of his strength. He feeds by digging up roots, and the instruments by which he does this are also those of his defence. The position of the tusk defends the eye in rushing through the underwood, and the formation of the skull and of the spine, and the mass of muscle in the neck all show the intention that he shall drive onward with his whole weight and strength, so that he may rend with his tusks. Accordingly we see that the back part of the skull rises in remarkable spines or ridges for the attachment of muscles; and that corresponding with these, the spinous processes of the vertebræ of the neck and back are of extraordinary length and strength. These processes distinctly indicate the power of the muscles which pass from the neck to the head. We now understand the reason of the shortness and inflexibility of the neck, because the power of the shoulders is directed to the head, and we may say to these large tusks. An elongated and flexible neck would have rendered these provisions useless. The characteristic form of the wild boar then consists in the height of the back, the shortness and thickness of the neck, the wedge shape of the head, the projection of the tusk, and the shortness of the fore limbs, which must always be in proportion to the neck."

The wild boar, once common in our island, and

still abundant in many parts of Europe and Asia, is undoubtedly the origin of our numerous domestic varieties; but at what period man reclaimed the race is very uncertain. The time and circumstances, indeed, connected with the domestication of every animal subject to the bondage of man, are enveloped in obscurity. The domestication, however, of the wild boar would be one of the easiest accomplishment. Young individuals captured in their native forest become very soon reconciled to captivity, and display the habits and manners of the descendants of a race long subject to the control of the monarch of creation. On the other hand, the domestic race must only be regarded as half reclaimed; and as the hog contentedly bears the restraints of captivity, so it as readily resumes a life of self-dependence.

The wild race may be distinguished from our domestic varieties by the greater elongation of the snout, by the ears being short and erect, and by the whole contour being more robust and bony. The bristles are long and coarse, and the general colour is rusty black, or blackish brown, more or less brindled in patches. After the age of three years the wild boar leads a solitary life in the forest, fearless of every foe, and confident in his weapons, which, added to his great strength, render him a most formidable antagonist. It is not, however, until the age of five or six years that he attains his full dimensions, and the duration of his life is from twenty-five to thirty years. The females with their young associate in large herds for mutual protection: on the approach of an enemy the young are placed in the centre, the older ones forming a circle around them, and should he be hazardous enough to venture on the attack he meets with a rough reception. It is in this way that the young are preserved from wolves, the chief foes to be dreaded by them; and to which, notwithstanding

the vigilance of the old females, they often fall a prey. It is only in defence of their offspring that the females are furious; but the old males are not to be approached without caution; indeed at certain seasons when in quest of the female, the wild boar is very savage, and should he meet a rival a most sanguinary combat ensues, often ending in the death of one or both.

Tum sævus aper,

Ipsè ruit, dentesque sabellicus exacuit sus,
 Et pede prosubigit terram, fricat arbore costas
 Atque hinc atque illinc humeros ad vulnera durat.

*Virg. Georg. Lib. III.**

In the month of December or January each male attaches himself to the society of a chosen female. They retire "beneath the shadow of some antre wild," or to an obscure and sheltered recess of the forest, "where low on earth the princely cedars lie," and, for about thirty days the pair never leave each other's company. The female carries her young for about four months, and produces, according to her age, from four to ten pigs, which she immediately withdraws from the cognisance of the male, who, instead of educating the family, would eat them. They are at first striped with longitudinal brown bands, on a ground of white and fawn colour. The female parent proves herself a most attentive mother. She suckles her young for three or four months, and retains them in her presence for a much longer time, to instruct and defend them. Her courage in the protection of her offspring is indomitable, and the latter repay her attention by a constant and long-continued attachment. An aged female is some-

* The bristled boar,

Now grinds his arming tusks and digs the ground,—
 He rubs his sides against a tree—prepares
 And hardens both his shoulders for the wars.

Carey's Virgil.



[Female Wild Boar with her Young.]

times seen followed by several families, among which there are individuals of two or three years old, and consequently almost in the adult state. These young rovers are called by the French hunters *bêtes de compagnie*. Sometimes several females, each with one or more families, herd together, and such assemblages are sufficiently formidable, whether viewed in connexion with the damage which they occasion to the fields in which they pasture, or with the danger

which is likely to accrue to the rash and inexperienced huntsman. *Quarterly Journal of Agriculture*, Vol. ii.

The wild boar may be regarded as nocturnal in his habits, and it is seldom, except when forced by the dogs of the hunter, that he stirs from his lair during the day. Night is his season of activity: on the approach of twilight he sets out in quest of food, which consists of acorns, beech-mast, roots, grain, and different vegetables, in quest of which he ploughs up the soft ground in long furrows with his snout. Though not decidedly carnivorous, the wild boar like his domestic descendant, does not refuse animal matters, which chance may throw in his way; he may be regarded in fact as an omnivorous animal, with an appetite and digestive powers alike suited to animal or vegetable aliment: unlike truly carnivorous animals, however, he does not ordinarily attack and kill others for the sake of their flesh, but only devours what he may meet dead in his rambles. Buffon mentions that he has found parts of the skin of a roebuck and the feet of birds in the stomach of a wild boar. Corn-lands, bordering forests haunted by wild boars, are subject to their nightly incursions, especially when the grain is ripe, or the ears are full: while engaged in feasting amidst the tall corn, which prevents their seeing the approach of any one, it is easy to come upon them by surprise, and shoot them before they are aware of the hunter's presence.

The wild boar makes his lair in the thickest and most impenetrable part of the forest, and he leaves it in the evening and returns to it in the morning, following an accustomed track. When roused from his haunt, which is not unattended with danger both to dogs and men, an old wild boar leisurely retreats, gnashing his tusks, and often stopping to make head against his pursuers; but a young boar of three years old is more rapid, and will run to a considera-

ble distance without stopping: it is, of course, more difficult to bring him to bay. The older animal, therefore, is preferred for the sake of the sport its chase affords, and the excitement produced by the danger involved in its slaughter. The chase of the wild boar has been a favourite diversion from the earliest ages in every country which the species inhabits. Allusions to it abound in the classic writings; nor have they neglected to paint the danger of the sport:—

Sanguine et igne micant oculi, riget horrida cervix,
 Et setæ similes rigidis hastilibus horrent;
 Stantque velut vallum, velut alta hastilia setæ;
 Fervida cum rauco latos stridore per armos
 Spuma fluit; dentes æquantur dentibus Indis;
 Fulmen ab ore venit, frontes afflatibus ardent.

*Ovid, Fab. IV. Lib. VIII.**

After this follows a spirited account of the chase, in which the fury and strength of the enraged beast are admirably depicted. It would appear that the ancients endeavoured to enclose the boar by nets, or at least prevent his escaping into the recesses of the woods. Horace also alludes to the use of nets in boar hunting. The combat was close, and therefore very dangerous: driven from his lair by the dogs, and pursued by them till he turned savagely upon his assailants, the hunters pressed upon him with javelins and spears till he received a mortal wound. In the middle ages the wild boar was hunted by

- * His eye-balls glare with fire suffus'd with blood;
 His neck shoots up a thick-set thorny wood;
 His bristled back a trench impal'd appears,
 And stands erected like a field of spears;
 Froth fills his chaps, he sends a grunting sound,
 And part he churns, and part befoams the ground
 For tusks with Indian elephants he strove,
 And Jove's own thunder from his mouth he drove.

Dryden's Trans.

dogs and men armed with spears, both in our own country and on the continent, the animal being one of the noble "beastes of venery," and protected by legal or rather royal decrees.

● In his work on British quadrupeds, Mr. Bell says, "About the year 940 the laws of Hoel Dha direct that it shall be lawful for the chief of his huntsmen to chase the boar of the woods from the fifth of the ides of November (9th) until the calends of December (1st), cap. xxi. sect. 14. In the next century the numbers had perhaps begun to diminish, since a forest law of William I., established in A.D. 1087, ordained that any who are found guilty of killing the stag, the roebuck, or the *wild boar*, should have their eyes put out; and sometimes the penalty appears to have been a painful death. It appears, indeed, that Charles I. turned out some wild swine in the New Forest for the purpose of restoring the breed to that royal hunting-ground, but they were all of them destroyed during the civil war."

The precise period in which the wild boar became extinct in the British Islands, as a free denizen of the forest, is not determined; it has, however, as Mr. Bell observes, "its name immortalised by having given origin to the name of many places in different parts of the country, and by its introduction into the armorial bearings of many distinguished families of every division of the kingdom:" it would appear that the "village of Brancepeth and the adjoining hill called Brandon, in the county of Durham, took their names from a wild boar, or *brawn*, which is recorded to have been a terrific beast, and the dread of the whole neighbourhood; his *den* being on *Brandon* (brawn-den) hill, and his usual track or *path* leading through the woods of Brancepeth (Brawn's-path). Tradition states that one Roger Hodge, or Hoodge, valiantly slew the monster, and delivered the district

from his ravages. The seal of this illustrious Roger still remains, and represents a *boar passant*." (See Surtees' 'History of Durham,' iii. p. 284.)

In the latter part of the 12th century, the forest which then surrounded London abounded in boars and other wild animals, as we learn from a 'Description of London,' written by Fitzstephen in the reign of Henry II. "On the north," he observes, "are corn-fields, pastures, and delightful meadows, intermixed with pleasant streams, on which stands many a mill, whose clack is so grateful to the ear. Beyond them an immense forest extends itself, beautified with woods and groves, and full of the lairs and coverts of beasts and game, stags, bucks, boars, and wild bulls."

Whitaker, in his 'History of Manchester' (vol. ii. 92, &c.), observes, that "The face of the island at this period was everywhere tufted with woods, and some particular districts of it were covered with immense forests. Three of these were distinguished over the rest by the wild extensiveness of their range. One was in Scotland, and lined all the hills in the central parts of the Highlands. Another was the great forest of the Coritani, which contained several towns, and the seat of a whole nation within it, and straggled over the five counties of Lincoln, Nottingham, Derby, Leicester, and Rutland, and even such parts of Northamptonshire as lie to the north of the Ner. But the third was still larger than either, and swept across the south of the island for an hundred and fifty miles together, ranging even from Kent into Somersetshire. These necessarily remained the secure harbours and great nurseries of the many wild beasts which were then produced in the country. In this appearance of the country, the spirit of hunting which actuated the primeval Britons would be kept alive in the Romans by the nearly equal

frequency of the game in the woods, and the nearly equal necessity of preventing its increase upon them. . . . The boar roved at liberty over the woods of the parish for many centuries after the Roman departure from the station; and . . . consigned the appellation of Barlow, or the Boar-ground, to a district in the south-westerly parts of it, and retained its haunts in the wilds of Blakely within these three or four ages."

Certain districts in Scotland were also formerly noted as being frequented by this animal. It appears that a tract of country now forming one of the extremities of the county of Fife was anciently called Mucross, or Muccrosse, respecting which we read, in Martine's 'Reliquiæ,'—"The place then was a forest for wild boars, and was called in the countrie language Muccrosse, i. e., a land of boars, from *muc*, a sow, and *ross*, a land or island."

In Sir Robert Sibbald's Fife there occurs the following notice of another portion of the same district: "There, a mile west of it, on a level ground and fertile, and six miles from Fifeness, is the metropolitan city of St. Andrews; anciently all round was forrest, and infested with *boars*—hence this wood was called *cursus apri*; and these lands, called *Byrehills*, were truly *Boar-hills*, as the learned Mr. Martine describes, in his 'Reliquiæ Sancti Andreae.' They tell of one boar that was of a vast bulk and fierceness, and that two of his teeth [tusks], each sixteen inches long and four thick, were chained to St. Andrew's altar in the cathedral church now demolished."

In reference to this, Holingshed says ('Chronicles,' Scotland)—"He also gave unto the church of St. Andrews the lands called the Boarrinke, so named for that a great boar was slayne upon the sayd ground, that had done much hurt in the country thereabout. The tuskes of this boare doe hang in chaynes upon



Bear-hunt in Europe. — Middle Ages.

the quier in Saint Andrew's church, afore the high aulter, and are sixteen inches in length, and four inches in thicknesse."

That boar-hunting should have been followed with ardour by our rude and warlike forefathers, is by no means to be wondered at: their feelings were interested in a sport the very dangers of which produced excitement; besides which, all were glad of an opportunity of displaying their strength, prowess, and dexterity. Hence was the boar reckoned among the "beastis of venery," that is, in the first class of game. The following is recorded in Strutt's 'Anglo-Saxons,' vol. iii. p. 119.

“ Master John Gyfford and William Twety, that were with King Edward the Second, composed a book on the craft of hunting, the which book is now preserved in the Cottonian Library; part of it is in verse, part in prose. It beginneth thus:—

“ All such dysport as voydeth ydilnesse
It syttyth every gentleman to knowe,
For myrth annexed is to gentlenesse.

And for to sette yonga huntierys in the way
To venery. I cast me fyrst to go:
Of whiche 4 bestes be, that is to say
The hare, the herte, the wulf he, the wild boor also,
And then ben other bestis five of the chase,
The buk the first, the do the second,
The fox the thyrde, which oft has hard grace,
The ferthe the martyn, and the last the roo.”

These authors then describe in prose—

The Boor. First he is a pig, as long as he is with his damme; and then the damme leyyth him then he is called a *gorgeaunt*, and in the third yeare he is called an *hoggast*, and when they be four yere of age they shall depart fro the sound for age, and when he goeth poole, then he is called a *boor*.”

Among the rules to be observed in hunting—

“When the boor is i take he be deffyted alvelve, and he shall have 32 hasceleytys, and ye shal gif your houndes the bowellis, boyled with bredd; for cause that it is etyn on the earth and not on the skynve. When he shall be carried home the houndes shall be rewarded with the fete, and the body to the kechyne.”

In the ‘Book of St. Albans,’ so called from having been first printed in 1486 at the abbey there, are a series of metrical treatises on hunting, hawking, angling, and heraldry, written in the fourteenth century, by Dame Juliana Berners, prioress of the nunnery of Sopwell, in which, the animals of “venery” are mentioned in the same manner:—

“Four manner beastis of venery there are,
The first of them is the hart, the second is the hare,
The boar is one of tho; the wolf and not one mo.
And where that ye come in plain or in place
I shall tell you which be beastis of enchase.
One of them is the buck, another is the doe,
The fox, the marteron, and the wild roe.
And ye shall, my dear child, other beastis all
Whereso ye find them, Rascal ye shall them call,
In frith or in fell, or in forest I you tell.”

These and other rules, as the “dame” intimates, were taken from “Tristan,” the title of a work (or the name of the author of a work) now lost; but which seems in former times to have been the standard authority on the subject of hunting.

In Strutt’s ‘Sports and Pastimes of the People of England’ are given two engravings on the subject of boar hunting; one from a manuscript of the ninth century, representing a Saxon chieftain attended by his huntsman and a couple of hounds, pursuing the wild swine in a forest, and the other showing the manner in which the animal was attacked in the fourteenth century.

Sharon Turner, in his history of the Anglo-Saxons,

observes that, "among the drawings in the Saxon Calendar, in the Cotton Library (Tib. b. 4), the month of *September* represents a boar hunt; a wood appears containing boars; a man is on foot with a spear; another appears with a horn, slung and applied to his mouth; he has also a spear, and dogs are following." . . . In the Saxon dialogues we have this conversation on hunting:—" 'I am a hunter to one of the kings.' 'How do you exercise your art?' 'I spread my nets, and set them in a fit place, and instruct my hounds to pursue the *wild deer* till they come to the nets unexpectedly, and so are entangled, and I slay them in the nets.' 'Cannot you hunt without nets?' 'Yes, with swift hounds I follow the *wild deer*.' 'What wild deer do you chiefly take?' 'Harts, boars, and fallow-deer, (*rava*) and goats, and sometimes hares.' 'Did you hunt to-day?' 'No, because it was Sunday, but yesterday I did. I took two harts and one boar.' 'How?' 'The harts in nets, the boar I slew.' 'How dared you slay him?' 'The hounds drove him to me, and I, standing opposite, slew him.' 'You were bold.' 'A hunter should not be fearful,' " &c. &c.

The boar's head was in former times the part in most request, and it was usually served up in state at the tables of our ancestors, and on some occasions with ceremonies savouring not a little of the ridiculous.

There is a tract in the *Miscellanea Antiqua Anglicana*, giving an account of a *Christmas piece*, as it was performed in the University of Oxford in 1607, written by one of the persons engaged in it, in which is the following passage:—"The first messe was a boar's head, which was carried by y^e tallest and lustiest of y^e guard, before whom as attendants wente first, one attired in a horseman's coate, wth a boars' spear in his hand, next to him an other huntsman

in greene, with a bloody faulcion drawn, next to him 2 pages in taffatye sarcenet, each of y^m wth a messe of mustard; next to whom came hee y^t carried y^e boar's head crost wth a green silk scarfe, by w^h hunge y^e empty scabbard of y^e faulcion w^h was carried before him. As y^{ci} entred y^e hall, he sang this Christmas carroll, y^e three last verses of every staffe beinge repeated after him by y^e whole companye:—

The Boar is dead, &
 Loe, heare is his heade,
 What man could have done more
 Than his head of to strike
 Melæager like,
 And bring it as I doe before?

He living spoyled
 Where good men toyled,
 Which made kind Ceres sorry,
 But now dead and drawne
 Is very good brawne,
 And we have brought it for ye.

Then sett down the swineyard,
 The foe to ye vineyard,
 Let Bacchus crowne his fall,
 Let this boar's head and mustard,
 Stand for pigg, goose, and custard,
 And so ye are welcome all."

[In the first volume of *Hone's Every Day Book* p. 1619, there is some farther information relative to *boar's head at Christmas*, and a caroll, taken from "Wynkyn de Worde's Christmas Carolles," on bringing in the boar's head.]

In those parts of the continent where the w^h boar yet exists, the chase of the animal is still prised, but as in the case of the fox or wolf, for the sake of the excitement only—for, according to Buffon, no part of an *old* boar except the head is eatable, and it is the *oldest* that are preferred for the sport: the flesh, however, of the young ones still under the

care of the mother, as well as of such as are somewhat older, is excellent.

“As the boar,” says Buffon, “retreats but slowly, leaves a very strong odour, and defends himself against the dogs, always wounding them dangerously, it will not do to chase him with good and swift hounds destined for the stag or roe, as this sort of pursuit would spoil their scent and get them into the habit of going slowly; mastiffs, with slight training, suffice for the chase of the wild boar.”

These directions are evidently borrowed from a celebrated French treatise on hunting and falconry, written in the sixteenth century, by Jaques du Fouilloux, who gives the same advice, alleging that hounds soon lose all delicacy of scent when accustomed to the overpowering odour of this animal, and to have their game constantly in view; besides which, the ferocity of the animal is another objection to their use; for being valuable rather for speed and the delicacy of their nose than for strength, good hounds are risked in an encounter better fitted for dogs of less value.

The boar, he observes, will kill a dog with a single blow from his tusks, and when he turns upon a pack generally selects the strongest, and will lay several of them dead in as many blows. He gives an instance which came under his notice, in which a boar pursued by fifty dogs suddenly turned upon his assailants, and not only slew six or seven of them, but wounded so many more, that only ten of the whole number came home uninjured.

In some of the forest districts of France the wild boar is still common, and even in the forest of Chantilly, within 40 miles of Paris, the breed exists, or at least existed so lately as 1830; and the late Prince of Condé, who died in that year, kept a pack of dogs for the express purpose of boar-hunting.

*Bear Chase.*

The dogs were a kind of large bony hound of great strength, and well adapted to the hazardous encounter.

The French newspapers, towards the end of last century, contained an extraordinary account of a wild boar which was killed in the neighbourhood of Cognac in Angoumois. This animal had previously been several times seen and pursued by the hunters, but it had always contrived to effect its escape, although it had received many desperate gunshot wounds, and had sacrificed the lives of numerous dogs and of several men. When it was finally slain, not a few old bullets were found sticking between the skin and the flesh. Sonnini says that this animal was of enormous size (he does not state either its height or dimensions); that it had a very long head, a very sharp and pointed snout, a terrific mouth, armed with teeth, and tusks of a very singular form. The hairs of its body were white; those of the head yellowish; the neck was marked with a black band, in the form of a cravat, and the ears were large and straight. Notwithstanding its size, it was an animal of uncommon swiftness.

It is in India, however, rather than in Europe where the sport of boar-hunting is most in vogue, and where indeed it continues to be ardently followed. The hunters are always mounted on horseback, and instead of meeting the animal with spears, attack him with javelins, which are launched at him, either as he flies, or advances to the charge, which is sometimes so determined, that the horses cannot be brought to stand the shock: an instance of this kind is related by Mr. Johnson:—"I was one," he observes, "of a party of eight gentlemen on a sporting excursion at Hye near the city of Patna, on the banks of the Soane river. Returning one morning from



Bear Hunting in India.

shooting, we met with a very large boar, in a rhur*, which we did not fire at or molest, as several of the gentlemen were very fond of hunting them, and we had no spears with us. The next morning we all sallied forth in search of him, and just as we arrived at the spot where we saw him the day before, we discovered him at some distance trotting off towards a grass jungle on the banks of the river: we pressed our horses as fast as possible, and were nearly up with him, when he disappeared all at once: our horses were then nearly at their full speed, and four of them could not be pulled up in time to prevent their going into a deep branch of the river, the banks of which were at least fourteen or fifteen feet high: luckily for us there was no water in it, or any thing but fine sand, and no person was hurt. One of the horses which was very vicious got loose, attacked the others, and obliged all the gentlemen to quit them and walk to their tents, where one of the horses had arrived before them, and the rest were soon caught. A few days after we went again early in the morning in pursuit of the same hog, and found him farther off from the grass jungle in a rhur-field, from which with much difficulty we drove him into a plain, where he stood at bay challenging the whole party, boldly charging every horse that came within fifty yards of him, grunting loudly as he advanced. I was then a novice in the sport, but I have never since seen any hog charge so fiercely. The horse I rode would not go near him, and when I was at a considerable distance off, he charged another horse with such ferocity, that mine reared and plunged in such a violent manner as to throw me off: two or three others were dismounted nearly at the same time,

* Rhur is a species of leguminous plant, growing from four to six feet high; the seeds are eaten both by the natives of India, and cattle.

and although there were many horses present that had been long accustomed to the sport, not one of them would stand his charges; he fairly drove the whole party off the field, and gently trotted on to the grass jungle, (foaming and grinding his tusks, through which it was impossible to follow or drive him.)

The same writer states that he was present at the death of a boar, the largest he had ever seen, which measured in height to the top of the shoulders forty three inches; his tusks were ten inches long. He was old and thin, but very fierce, and of two very large greyhounds slipped to him, one he instantly killed, and the other he severely wounded.

Bruce, in his 'Travels in Abyssinia,' states that the wild boar of that country is smaller and smoother in the hair than that of Barbary or Europe, from which he differs in nothing else; and that he is more frequently in swamps, or banks of rivers covered with wood. "As he is accounted unclean in Abyssinia, both by Christians and Mohammedans, consequently not persecuted by the hunters, both he and the fox should have multiplied; but it is probable they and many other beasts, when young, are destroyed by the ferocious hyæna."

On one occasion, he observes,—“Amongst us we killed five boars, all large ones, in the space of about two hours; one of which measured six feet nine inches; and though he ran at an amazing speed, near two miles, so as to be with difficulty overtaken by the horse, and was struck through and through with two heavy lances loaded at the end with iron, no person dared to come near him on foot, and he defended himself above half an hour, till, having no other arms left, I shot him with a horse-pistol. But the misfortune was, that, after our hunting had been crowned with success, we did not dare to partake of

the excellent venison we had acquired; for the Abyssinians hold pork of all kinds in the utmost detestation; and I was now become cautious lest I should give offence, being at no great distance from the capital."

The detestation in which the hog was held is a feeling which has been entertained by certain nations from the earliest antiquity. Paxton, in his 'Illustrations of Scripture' (vol. i. 502), says, "The hog was justly classed by the Jews among the vilest animals in the scale of animated nature; and it cannot be doubted that his keeper generally shared in the contempt and abhorrence which he had excited. The prodigal son in the parable had spent his all in riotous living, and was ready to perish through want before he submitted to the humiliating employment of feeding swine."*

"In Egypt, if we may believe Herodotus, the swine-herd was numbered with the profane, and forbidden to enter the temples of their gods; and even the lowest dregs of the people refused to bestow their daughters on him in marriage." The Egyptians, says Herodotus, "are forbidden to sacrifice swine to any other deities than to *Bacchus*, and to the *Moon* when completely full, at which time they may eat of the flesh. . . . In the evening of the festival of *Bacchus*, though every one be obliged to kill a swine before the door of his house, yet he immediately restores the carcass to the swine-herd that sold him." (*Herodotus, Euterpe.*) Among the Greeks and

* 'Hartley's Greece,' 218.

"He said, would have filled his belly with the husks that the swine did eat." Luke xv. 16.

It has been remarked by commentators "that the husk, (*κισσάρια*) here mentioned are the fruit of the ceratonia, or carob tree. The modern Greeks still call this fruit by the same names *κισσάρια*, and sell them in the markets. They are given to swine, but not rejected as food even by men."

Romans, it was a custom to offer a hog to Ceres at the beginning of harvest, and another to Bacchus before they began to gather the vintage, because that animal is equally hostile to the growing corn and the loaded vineyard.

The injury occasionally done to the vineyard by the incursions of this animal is strikingly alluded to by the Psalmist. "The boar out of the wood doth waste it, and the wild beast of the field doth devour it." Psalm lxxx. 13. Hartley, in his 'Researches in Greece,' alluding to the above passage, says:

"My friend, the Rev. Mr. Leeves was proceeding, in the dusk of the evening, from Constantinople to Therapia. Passing a vineyard, he observed an animal of large size rushing forth from amongst the vines, crossing the road and taking to flight with great precipitation. The Greek surigee, who was riding first, exclaimed Γουπόβρι, Γουπόβρι, 'Wild boar! wild boar!' and really it proved a wild boar, who was retreating from the vineyards to the woods. 'What has the wild boar to do in the vineyard?' inquired Mr. Leeves. 'Oh!' said the surigee, 'tis the custom of the wild boars to frequent the vineyards, and to devour the grapes.' And it is astonishing what havoc a wild boar is capable of effecting during a single night. What with eating, and what with trampling under foot, he will destroy an immense quantity of grapes."

That the office of swine-herd was accounted by other nations also, as well as by the Egyptians, at least degrading, if not utterly abominable, may be inferred from the silence of the classic writers, and especially the poets who painted rural life, respecting the character or the duties of his office. Homer, it must be admitted, honours Eumæus, the swine-herd of Ulysses, with many commendations; but he is a remarkable exception. Theocritus never introduces

the swine-herd in his Idyls among those who tended flocks and herds; neither is the swine-herd ever brought forward in the Eclogues of Virgil among his tuneful shepherds.

The motives which led to the prohibition of the flesh of the hog as food, both among the Egyptians, Jews, and other people, are not easy of solution. Sonnini conjectures that the race of hogs in Egypt, like the Chinese and Siam breed, might have had their flesh too fat, and consequently too oppressive to the stomach in a scorching atmosphere,—and that being thus unwholesome, if not positively pernicious, policy might have interdicted its use. This attempt at an explanation, however, is very unsatisfactory.

The range of the wild boar throughout Europe, Asia, and Africa is, as will be inferred, of remarkable extent, if, indeed, as most naturalists admit, the species in each country be absolutely identical; a point, however, which there is some reason to question. At all events slight differences may be observed between the Indian wild boar and the present breed of the German forests; and Sonnini expresses a doubt with respect to the identity of the Egyptian and European wild race, as would appear by the following passage, which is otherwise not destitute of interest. “It does not appear to me probable that the wild boars of Europe and of Egypt should be the same. The great difference of climate, and the still greater of situation, must necessarily have occasioned some variety at least in the species. More prolific in temperate or in cold countries, which appear more suitable to their nature, they inhabit the depths of the forests, which afford them food in abundance. From these they never issue, except to proceed from one wood to another, or to spoil the harvest; and these journeys

or excursions for depredation are scarcely ever undertaken but by night. At the rising of the sun they commonly retire to the thickest and darkest places, as if they dreaded the light and heat of his beams. In Egypt, on the contrary, the wild boar has no shelter. Continually exposed to the fervour of a burning sun, he traverses sands equally heated, where he scarcely meets with a few scattered shrubs, which afford him little subsistence, and still less shade. He is seen pretty frequently, however, in the desert of Nitria, where animals are more numerous than in any other part of the desert, on account of the collections of water it contains, and the plants that grow on their borders." M. Sonnini further states that they are solitary, that the Mohammedans and Cophts refrain from the flesh of the wild boar as from that of the hog, that the wild boar is termed in Egypt *tranzire*, and he supposes that the African wild boar of Buffon and the *tranzire* are the same. We have already stated that the wild hog is regarded as the original of our domestic race, which, as with all our reclaimed animals, has branched out into numerous varieties, differing in the length of the limbs or snout, in the relative size of the ears, or the symmetry of the body. The differences, however, do not end here; for so considerably do the number of the vertebræ of the spinal column vary, as to lead to the supposition of an original and specific distinction between the races, a supposition against which the fact of the different races intermixing together appears to militate. In the Proceedings of the Zoological Society for February 28, 1837, p. 283, will be found a notice by T. C. Eyton, Esq., of these osteological differences, from which we take the following:—

"Having during the last year prepared the skeleton of a male *Pig* of the pure Chinese breed,

brought over by Lord Northampton, I was surprised to find that a very great difference existed in the number of the vertebræ from that given in the *Leçons d'Anatomie Comparée*, vol. i., Ed. 1835, p. 182, under the head either of *Sanglier* or *Cochon Domestique*. A short time afterwards, through the kindness of Sir Rowland Hill, Bart., M.P., I prepared the skeleton of a female *Pig* from Africa: this also differed, as also does the English long-legged sort, as it is commonly called.

"The following table will show the differences in the number of the vertebræ in each skeleton with those given in the work above quoted:—

	English		African		Chinese		Leçons d'Anat. Comp.	
	Male.	Female.	Male.	Female.	Male.	Female.	<i>Sanglier.</i>	<i>Coch. dom.</i>
Cerv. . .	7	7	7	7	7	7	7	7
Dors. . .	15	13	15	13	15	14	14	14
Lumb. . .	6	6	4	4	4	5	5	5
Sac. . .	5	5	4	4	4	4	4	4
Caud. . .	21	13	19	19	20	20	23	23
Total . .	55	44	49	49	50	50	53	53

It is possible that some of the caudal vertebræ may be missing.

"The Chinese *Pig* was imported into this country for the purpose of improving our native sorts, with which it breeds freely, and the offspring are again fruitful. I this winter saw a fine litter of *Pigs* by Sir Rowland Hill's African *Boar*, imported with the female I described, the mother of which was a common *Pig*: time will show whether they will again be fruitful.

"From what has been stated the result appears to me to be that either the above three *Pigs* must be considered as distinct species, and which, should the offspring of the two latter again produce young, would do away with the theory of Hunter, that the

young of two distinct species are not fruitful, or we cannot consider osteological character a criterion of species.

“I have been induced to offer the above not with any desire of species-making, but of adding something towards the number of recorded facts by which the question what is a *species* must be answered.”

When domestication produces decided differences of external form, we see no reason why it should be difficult to admit of the extension of the differences to internal parts also, and especially to the osseous framework, on which the form and symmetry of the body so greatly depends, why the law of variation should be confined in its influence to one part and restricted from another; or, if it be admitted, that the bones may be some what modified in length or stoutness, why it is that a numerical variation in the bones of the vertebral column should be so great a stumbling-block, especially seeing that accidental variations are far from being uncommon both in men and others of the mammalia. We can easily conceive that a portion of the osseous system, offering in almost every species of quadruped some variation in the number of its constituent parts would be also the most likely to exhibit such variation, where a species long subjected to the modifying influence of human control has branched out into various breeds or races distinguished by decided external characteristics. It would be interesting and important to know whether the numerical ratio of the vertebræ as given in the foregoing table is constant in each race; and also whether the same variation does not obtain among others of our domestic animals, divided into numerous breeds or races, as the dog, the sheep, and the goat. The subject has not yet been treated as fully and extensively as it deserves. With respect to the caudal vertebræ indeed, we know that they are

subject to great numerical variation, in most of our domestic animals; witness the dog, and even the common fowl, of which a tail-less breed, perpetuated from generation to generation, is far from being uncommon. What takes place in one part of the spinal column may, we conceive, occur also in another and more important portion to some, if not to so great an extent—and the modification may moreover be transmitted from one generation to another, as in the case of the tail-less fowl, or, to confine ourselves to the hog, in that of the breed with undivided hooves, or of the two-limbed variety in Tanjore, to which we have previously alluded.

In our own island there are several breeds of this useful animal, and various counties are celebrated for breeds of peculiar excellence; the test of this being productibility, a readiness to become fat, the firmness of the fat, and the good quality of the whole animal when converted into bacon. Size is of minor importance: indeed, since the introduction of the Chinese race, which has tended greatly to the improvement of our own races, we less frequently hear of instances of enormous magnitude than formerly. Many such, however, are on record. Mr. Culley, in his *Treatise on Live Stock*, gives an account of one killed at Congleton, in Cheshire, which measured from the nose to the end of the tail three yards eight inches; in height it was four feet and a half; and weighed after it was killed eighty-six stones eleven pounds avoirdupoise. It was of the Berkshire breed, which still retains considerable celebrity for its excellence. In the Orkneys and Hebrides there exists a small breed, of shaggy uncouth aspect, covered with long bristles, of which the inhabitants make those ropes by which the daring adventurers who gain a livelihood by plundering the nests of the wild fow, are lowered down the fearful precipices of the rocks:

they are less liable to be worn or cut by friction against the sharp edges of projecting shelves of stone than those made of hemp. This peculiar breed of hog is only semi-domesticated, the herds wander at will about the hills without care or shelter; but as they have not to act on the defensive against the wolf, they have nothing of the ferocity of their Swedish relatives. After their summer fare, they are said to be tolerably good eating, but are much improved by proper care and management. Occasionally they visit the corn grounds, where they make sad havoc, by rooting up excavations large enough, says Low, to bury half a dozen of them, which excavations "standing full of water all the winter do vast hurt to the grounds, though our farmers stiffly maintain the contrary." Their average weight does not exceed sixty or seventy pounds; a degeneracy to be attributed to the scantiness and innutritious quality of their ordinary food, which consists of mountain herbage, roots, and in fact whatever animal or vegetable matters they may chance to find.

The introduction of the Chinese breed into our island is comparatively recent, but it has materially improved our ordinary races; it is of small size, with a deep round body, full round haunches, a short thick neck, erect ears, and a short and abruptly sharpened snout; the limbs are short, and remarkably slender, with small compact toes; the prevailing colours are black, or half black and half white. The flesh is remarkable for its delicacy. This breed, or one closely related to it, extends from China throughout the various groups of islands in the South Pacific, where the early navigators found them of great service.

In India the hog is abhorred as an article of food, both by the Brahmin and Mussulman population; yet not only is the wild hog very common, but in the

Deccan at least the villages abound with a semi-reclaimed race, acting as scavengers in the streets. All property in these animals, as Colonel Sykes informs us, "is abjured by individuals and the community. These *village hogs* are of the same colour as the wild animal, mostly a rusty black, and the only variations are slate black or slate intense brown."

The abhorrence entertained by the Mussulman natives of India, and other portions of Asia and of Africa, against the hog as food is derived from the Jewish ritual: it is well known that this animal was among those forbidden to be eaten by the Hebrew nation: it does not appear, however, to have been driven out of Judea, or forbidden to be kept by persons residing there, though we may easily conclude that the proprietors of droves of swine were not of the Hebrew nation. Among the ancient Greeks and Romans, as among ourselves, the flesh of the hog was in high estimation, and sucking pig was as favourite a dish as in the present era. Among our Saxon forefathers, the hog was of peculiar value; its flesh was the staple article of consumption in every household, and much of the wealth of the rich and free portion of the community consisted in herds of swine. In Sir Walter Scott's novel of *Ivanhoe* we have a good portraiture of the habits and manners of a Saxon landed proprietor, to whom his herds of swine were of no little importance, and whose swine-herd, like a modern shepherd, had a charge of no ordinary trust. At the time of the Saxon dominion, England was covered to a great extent with forests; and these, chiefly of oak, afforded, at the time of the fall of the acorns or mast, an ample supply of nutritious food for the droves of swine, which, under the care of trusty thralls or bond-slaves, were driven into the woods, and anxiously guarded. The wolf at that time was one of the scourges of our island, and both

sheep and swine had to be protected from its assaults. In a Saxon calendar quoted by Sharon Turfner, in his 'History of the Anglo-Saxons,' and which illustrates the agricultural labours of our forefathers, occurs the following sketch of a shepherd's duty:— "In the first part of the morning I drive my sheep to their pasture, and stand over them in heat and in cold, lest the *wolves* destroy them." In an ancient Saxon grant, we find the right of pasturage for swine conveyed by deed:—"I give food for seventy swine in that woody allotment which the countrymen call Wolferden legh." It would appear also that among the same people the season for boar-hunting was September, and for hawking October. In Portugal, at the present day, the droves of swine are fed much in the same manner as formerly in our country, and are fattened on acorns; the bacon of Portugal has been noticed for its excellency, an excellency to be attributed to the diet upon which the animals are reared.

The Chinese, near as their country borders upon India, have derived no prejudices from the Mohamadan natives of that empire against the hog. On the contrary, they rear these animals in great numbers for the sake of their flesh, and of all their domestic animals none are so abundant or so universally kept. Few peasants are without a breed of them, and even the numerous population who tenant the floating town of rafts or barges on the river at Canton contrive to rear and keep them. It is from China, most probably, that the islands of the South Seas, so distant from the mainland, and often from each other, have, at some period or other, received the breed of swine which were there found in abundance by the earliest voyagers.

Mr. Wilson ('Quarterly Journal of Agriculture') says,— "One of the most singular circumstances in

the domestic history of this animal is the immense extent of its distribution, more especially in far-removed and insulated spots, inhabited by semi-barbarians, where the wild species is entirely unknown. For example, the South Sea Islanders, on their discovery by Europeans, were found to be well stocked with a small black-legged hog; and the traditionary belief of the people in regard to the original introduction of these animals showed that they were supposed to be as anciently descended as the people themselves. Yet the latter had no knowledge of the wild boar, or any other animal of the hog kind from which the domestic breed might have been supposed to be derived. The hog is in these islands the principal quadruped, and is more carefully cultivated than any other. The bread-fruit tree, either in the natural state, or formed into sour paste, is its favourite food, and it is also abundantly supplied with yams, eddoes, and other vegetables. This choice of a nutritive and abundant diet, according to Forster, renders the flesh juicy and delicious, and the fat, though rich, is not less delicate and agreeable to the taste than the finest butter. Before the missionary labours, which have proved so signally successful in those once forlorn and benighted regions, had substituted the mild spirit of Christianity for the sanguinary forms of a delusive worship, the Otaheitans and other South Sea Islanders were in the habit of presenting roasted pigs at the *Morais*, as the most savoury and acceptable offering to their deities which they had in their power to bestow. They covered the *sacred* pig with a piece of fine cloth, and left it to decay near the hallowed spot.

“Hogs are now abundant in America. They were not, however, indigenous in the new world, but were transported thither by the Spaniards soon after the discovery and conquest of the western regions by

that nation. Indeed, the extensive benefit now derivable from the creature in question may be said to proceed in a great measure from the facility with which it is conveyed from one quarter of the globe to another, combined with those omnivorous propensities which admit of its feeding and fattening in places apparently unadapted to its nature, and the quickness with which it conforms itself to a change of circumstances and station."

As is the case with the horse and the ox (animals equally with the hog of old-world derivation), the hog has become not only naturalised, but has spread in the same manner as these animals; and like them, has in many places given origin to a free and unclaimed race. In a paper in Professor Silliman's 'Journal on the Natural History of Washington County, Ohio,' we are informed that large numbers of hogs pass the winter in the woods there, as independently as the deer or the bears, subsisting on mast, acorns, &c. Single individuals sometimes fall a prey to bears or wolves; but ten or twenty hogs in a gang, acting on a system of mutual defence, are more than a match for the wolf or jaguar, which often fall in the combat. It is stated that an old hunter had once an opportunity of witnessing a contest of this kind: he saw a large panther (jaguar) spring from a tree into a drove of wood-hogs, who were aware of his approach, and prepared for defence: the moment he touched the ground, the large hogs fell upon him with their tusks and the weight of their bodies, and killed and tore him to pieces in a few minutes. Mr. Waterton, in his 'Wanderings,' notices a herd of wild swine, which he met in passing overland from the Essequibo to the Demerara: when they were perceived, "an Indian got his bow ready, and let fly at one of them a poisoned arrow. It entered the cheek-bone and broke off. The wild

hog was found quite dead about 170 paces from the place where he had been shot. He afforded us an excellent and wholesome supper."

Few animals, none perhaps approximating to it in size, are so fertile as the hog. The female produces twice in the year, and the number of each litter is from seven or eight to eighteen or even twenty. The young of the wild race, as we have already described, are characterised by irregular longitudinal streaks of reddish-brown along the sides, alternating with rusty black: these markings do not disappear until about two years old; but the young of our domestic races have no uniform livery, they are white, black, or party-coloured, as the chance may be.

It has been usual to call the hog a filthy, stupid brute, destitute of any intelligence; against which character we enter our protest. As regards the filthiness of the hog in a state of confinement, every thing will depend on the inclination and taste of its keeper; but no animal delights more in clean dry straw for a bed, in which it luxuriates with epicurean satisfaction, its twinkling little eyes and low grunt expressing its feelings of contentment. Doubtless it is to a certain extent omnivorous, nevertheless roots and other vegetable productions constitute the staple of its diet: for the former of these it ploughs up the earth with its wedge-shaped snout, as does also the mole in pursuit of worms. Like all the genuine *pachydermata*, the elephant, the rhinoceros, and the tapir, it is fond of wallowing in the mire; its tough hard skin but scantily protected (comparatively speaking) with harsh wiry bristles, is, notwithstanding its toughness, extremely sensitive. Nothing is more grateful to the animal than to have its hide rubbed and scratched, a circumstance which every one practically acquainted with pigs must have very frequently noticed. As in the case of the still

harder-skinned rhinoceros or elephant, a covering of mud is doubtless intended as a protection to the skin in the heat of summer (the time in which the hog chiefly delights to wallow) both against the scorching rays of the sun, and the attacks of myriads of puny but intolerable winged persecutors. The hog is a "*huge feeder*;" so is the ox and every other animal that has to support a bulky carcass upon vegetable aliment; and a fat hog is certainly a more comely-looking animal than a gaunt, lean, ill-fed beast. Although we cannot say much in favour of the docility of this animal, it is by no means destitute of intelligence. The horse, far more docile than the hog, is in this respect decidedly its inferior. It soon becomes familiar with persons to whom it is accustomed, will come to them when called, and follow them about in hopes of obtaining food, or notice; often indeed becoming too obtrusive. Sluggish and indolent when old, it indulges when young in fits of sportiveness, and if its gambols are not graceful, they are at least energetic and amusing. The senses of smell, taste, and hearing are possessed by the hog in great perfection; it is a common saying among a certain class of persons, that pigs can smell the wind; they are certainly aware of the approach of a storm, and are agitated during its continuance, screaming violently, and running about with straws in their mouths, or carrying it to their sty as if to add to their comfort or shelter. It is said that in some parts of Italy advantage is taken of the sense of smell of this animal, in training or rather employing it in searching for truffles. A string is tied to the animal's leg, and it is led into the field where this vegetable is produced, and wherever it begins to smell and dig, there the truffle is certain to be found. The most extraordinary instance, however, of the employment of the pig as an assistant to man, is that

related by Daniell in his 'Rural Sports,' for the truth of which there is abundant authority. The story may be briefly related as follows:—

A gamekeeper and his brother, of the name of Toomer, broke a pig to stand and point like a pointer, &c. The pig was of that sort which maintain themselves in the New Forest without regular feeding, except when they have young. It was trained to answer to the name of "Slut," and has stood at partridges, black game, pheasants, snipes, and rabbits in the same day, but was never known to point a hare. She has sometimes stood a jacksnipe when all the pointers had passed by it. She would back the dogs when they pointed, but the dogs refused to back her until spoken to, the gamekeeper's dogs being all trained to make a general halt when the word was given, whether any dog pointed or not, so that she has been frequently standing in the midst of a field of pointers. Her pace was mostly a trot; she was seldom known to gallop except when called upon to go a shooting. She was, after the death of Toomer, in the possession of Sir H. Mildmay, then in that of Colonel Sikes,—weighed 700lbs. at the time of being killed.

The domestic hog sometimes exhibits great ferocity, and this is more especially the case with the females, when surrounded by their new-born litter. Instances, however, have occurred in which no such motives could have actuated the animal. Brown, in a little work entitled 'Anecdotes of Animals,' relates the following:—"On Saturday, Nov. 24, 1837, a man named Martin, a dealer in pigs, residing at Paradise Row, Maiden Lane, Battle Bridge, was killed under the following circumstances. He kept a huge boar, and about twelve o'clock that day he was driving it along. When he arrived near the canal bridge, in Maiden Lane, the beast turned on

him, and attacked the poor man with the utmost fury, knocked him down, and with its tusks inflicted several wounds in the abdomen, from which his entrails protruded. Some persons near the spot found the unfortunate man still living, and placed him in a cart for conveyance to St. Bartholomew's hospital, but he died on the way."

Mr. Lloyd, in his 'Field Sports of Europe,' notices the savage fierceness and boldness of these animals in Sweden; a character doubtless to be attributed to their state of barely semi-domestication, and to the necessity they are so continually exposed to of defending themselves and their young while at large in the woods against the attacks of the wolf. One instance related is as follows:—"Towards evening, and when seven or eight miles from home, we came to a small hamlet situated in the recesses of the forest: here an old sow and her progeny made a dash at a brace of very valuable pointers I at that time had along with me, and who naturally took shelter behind us. My man had a light spear in his hand, similar to those used by our lancers; this I took possession of, and, directing him to throw the dogs over a fence, in the angle of which we were cooped up, I placed myself between the dogs and their pursuers. The sow nevertheless pressed forward, and it was only by giving her a severe blow across the snout with the but-end of the spear that I stopped her farther career. Nothing daunted, however, by this reception, she directed her next attack against myself, when, in self-defence, I was obliged to give her a home-thrust with the point of the spear. These attacks she repeated three several times, and as often got the spear up to the hilt in her head or neck. So savage and ferocious a beast I never saw in my life. In the fray I broke my spear, which was as well, for it was by no means

strong enough to answer the purpose for which it was intended. . . . This was not a solitary instance of the ferocity of pigs. It was the same throughout Sweden; for whenever they caught sight of my dogs they generally charged them, and if they came up with them, would tumble them over and over again with their snouts."

We shall conclude our account of the domestic hog with the following extract from the 'Quarterly Journal of Agriculture':—

"It is greatly doubted by many competent judges, whether swine form a profitable stock, at least when fed on food which requires to be raised for the purpose. The results deduced from calculations entered into to show the probable returns for a given quantity of grain, roots, or other vegetable produce, are, however, so discordant as to avail but little in the formation of a settled and conclusive opinion. In connexion with distilleries, dairies, breweries, and other large establishments, they are of much higher and more assured importance, and return, in proportion to the offal they consume, a great quantity of meat. Their chief advantage, as live stock, probably consists in their being nourished by what would otherwise either prove nearly useless, or be entirely lost. When potatoes are raised as a fallow crop, exceeding the demands of human consumption, the rearing of swine for bacon and pickled pork becomes an advisable branch of rural economy."

As local circumstances must, in a great measure, regulate the breeding and feeding of swine, it is impossible either to lay down rules of general application or to describe a practice which necessarily varies in almost every district. The sow carries her young for sixteen weeks. The pigs are usually weaned when about six weeks old, and, as the mother speedily comes again into season, a couple of litters are gene-

rally farrowed within the year. Indeed, there are sometimes five litters produced in two years, but this is an uncommon occurrence. The two following particulars should be especially attended to in the breeding of swine; that they should not be allowed to farrow in winter, as the young are exceedingly delicate, and thrive with difficulty in cold weather; nor at a time when food is scarce, as is the case for the most part on corn farms during summer, if the stock is considerable. The months of February and August have been recommended as the most proper time for parturition. Twenty swine are estimated to produce, at an average, seven pigs and a half each for their first litter. An extraordinary instance of fecundity in a sow occurred in this country between forty and fifty years ago. She was the property of Mr. Thomas Richdale, Kegworth, Leicestershire, and had produced 355 young ones in twenty litters. Buffon has observed that in this respect the sow forms an exception to two of the general rules of nature—that the largest animals are the least prolific, and that digitated quadrupeds produce the most numerous young. It is indeed not a very unusual circumstance for a sow to produce from fifteen to twenty at a birth; and instances are recorded of thirty-seven pigs having been produced by a single mother at one time.

PAPUAN HOG.

Besides the Common Wild Boar (*Sus Scrofa* Linn. *Sus Aper*, Briss.) the genus *Sus* contains two closely allied species, of which the first to be noticed is the Papuan hog (*Sus Papuensis*, Lesson and Garn. Zoologie de la Coquille).

Immediately related as is the Papuan hog to the common race, its distinctness, which was first pointed

out by M.M. Lesson and Garnot, is universally admitted. "This new species," says M. Lesson, "is remarkable for its small size, and its light and agreeable proportions; the canines of the upper jaw are very small, and nearly resembling the incisors in shape; the bristles are tolerably thick and short, yellow and brown above and below, ringed with black; the tail is very short. The livery of the young is brown more or less deep, with five streaks of lively yellow on the back; the length of this hog is three feet; it is common in the forests of New Guinea. The Papuans account its flesh a delicacy, and we found it to be excellent. They contrive to catch these animals while young in the woods, and rear them in a sort of domesticated condition. The *Sus Pappuensis* has many points of analogy with the Peccaries, and appears to be intermediate between these animals and the hog."

The Papuan name is *Bêne*, according to the authority of M. Lesson. Of this species we have seen no example: nor is anything known of it beyond what is to be gathered from the accounts of the writers who describe it.

It would be interesting to know whether a race intermediate between this species and the common hog would multiply and increase, as does the race between the Chinese and common breed, or between the wild boar and domestic pig, notwithstanding the osteological differences in the parents. The osteology of the Papuan hog is yet to be ascertained.

AFRICAN WOOD SWINE.

The next species is a savage and formidable animal common in southern Africa, and found also, it is said, in the island of Madagascar, and along the eastern coast of the African continent. By the colonists at the Cape of Good Hope it is termed

Bosch Vark or wood swine. (*Sus Africanus*, Schreb. *Sus larvatus*, F. Cuv.)

In general form the African wood swine resembles the wild boar of Europe, but its neck is shorter, its head larger in proportion, its snout broader, and a distinct tuberculous elevation covered with bristles is seated on the cheeks between the canine teeth (or tusks) and the eyes. Prompt and vicious, this animal is much to be dreaded in combat: its great strength, and the size and position of its tusks render it a match for the most daring enemy: like its European relative, however, it does not begin the assault; it does not seek the contest, but it does not decline it. It is said to dwell in excavations in the ground, where it is very dangerous to attack it, as it rushes out suddenly from its retreat and deals rapid destruction among its assailants.

Dr. Smith observes that this species is subject to great variety of colouring, scarcely any two specimens being precisely alike; some are of a brownish black variegated with white, and others are of an almost uniform light reddish brown or rufous, without white markings; and it is scarcely possible to say which is the most prevailing style of colouring. The bristles are long, particularly upon the upper parts of the neck and back; the canines are very strong, the ears are short, and thinly covered both without and within with coarse black hair, which is longest at their tips; the tail is thinly covered with black bristles. Average length of body between four and five feet; of the tail one foot.

Sparrman, who was well acquainted with this species, during his residence in South Africa, gives us a good account of its habits and manners, whence it would appear that the young and the females associate in herds, for the sake of mutual defence, as is the case with the wild swine of Europe. In the

tenth chapter, this accurate writer says, "This day I saw for the first time a herd of *boschwarkens*, or as they are likewise called *wilde varkens* (wood swine or wild swine), in their wild uncultivated state; for I had hitherto seen only one of this species of animals in the menagerie at the Cape. He was confined there with a strong iron chain, and was very wild and vicious. M. Pallas informs us in his *Spicel. Zool.* Fasc. xi, add. p. 84, that one of them killed the keeper of the menagerie at Amsterdam. One may easily conceive that this creature is very dangerous, if one only takes notice of its large tusks. . . . In a head of this animal, salted and dried, which I gave to the Royal Academy of Sciences in Sweden, the upper tusks stand nine inches out of the jaws, and measure full five inches in circumference at the base. The two other tusks which come from the lower jaw project but three inches from the mouth, being flat on the inside, and corresponding with another plain surface similar to it in the upper tusks. These the beasts make use of not so much for biting as for goring and butting with. A little pig of this species which I afterwards caught at *Visch rivier*, and had tied up, thinking to bring it alive along with me, had already got this trick, so that I was soon obliged to let it be killed. It was terribly vicious, and quick in all its motions; and though at that time not absolutely dangerous, yet my Boshies men were very much afraid of it. 'We had rather,' said they, 'attack a lion on the plain, than an African wild boar: for this, though much smaller, comes rushing on a man as swift as an arrow, and throwing him down, snaps his legs in two, and rips up his belly before he can get to strike it, and kill it with his javelin.' . . . The dwelling-place of this same species of wild boar, to which the avenues seemed to be very narrow, is under ground. I have been told indeed

that the *bosch varkens* go down into them backwards, and place themselves there in a row one behind the other; but this is not very likely, for, probably, these passages are widened lower down. Thus much, however, is certain, that people dare not attack them in their holes, for fear of their coming out on them on a sudden. The body of this animal is small in comparison with its head, a conformation which facilitates its burrowing and living underground.

“It would not be advisable for a man on horseback to approach too near or to hunt this animal, as it will often turn round on a sudden, and, striking with its tusks at the horse’s legs, afterwards kill both him and his rider.

“This day I pursued several young pigs with the old sows, with a view to shoot one of them, but in vain; nevertheless the chase of them afforded me peculiar pleasure. On a sudden, the heads of the old ones, which before were of a tolerable size, seemed to have grown still larger, and more shapeless than they were before; which momentary and wonderful change astonished me so much the more, as my hard riding over a country full of bushes and pits had hitherto prevented me from giving sufficient attention to the manner in which it was brought about. The secret, however, consisted in this: each of the old ones, while they were making off, took a pig in its mouth; a circumstance that also explained to me another subject of my surprise, namely, that all the pigs which I was just before chasing along with the old ones vanished all on a sudden. In this action we find a kind of unanimity among the woodswine, in which they resemble the tame species, and which they have in a greater degree than many other animals. It is very astonishing that the pigs should be carried about in this manner between such large

tusks as those of their mothers, without being hurt, or crying out in the least. I saw the same done, however, on two other occasions, as I was chasing them. The cry of their young was like that of our common pigs, as I found in some we afterwards caught."

Whether the wood-swine will breed with the domestic race, and if so, whether the progeny will be fruitful, yet remains to be tried. Pallas, indeed, notices the failure of an experiment; but Sparrman informs us that he *heard* of a farmer in South Africa who had a brood between the wood-swine and the ordinary race, but he does not vouch for the accuracy of the statement. The same traveller says, "I observed a peculiar circumstance on my return home through *Lange-Kloof*, which was, that two tame pigs (wood-swine) at a farmer's in that province, not only went down on their knees to graze, but even successively changed this posture to that of standing with the greatest ease. This faculty the animal seems to have acquired in its subterranean caverns, and it proceeds from the creature's neck being too short to be conveniently lowered to the ground."... "The tail is flattened at the tip, and this appendage they never fail, either old or young, to hold quite erect in the air during the whole time they are pursued. With respect to taste I found the flesh very much resemble that of the ordinary pig. I never observed the animals to be of that dark hue ascribed to them by M. Pallas, and which M. Vosmaer has given them in the coloured figures he has published; those that I saw being of a bright yellow colour, like the greatest part of our domestic swine. Neither did I hear any body in the colony call them *haartloopers*, as M. Vosmaer pretends they are termed; though, on the other hand, I have frequently heard the Hottentots call them *kaunaba*, and have likewise been informed by the same people that these

creatures are fond of walking in the mire, and are wont to grub after the root of a shrub of the mesembryanthemum kind, which they call 'da-l'kai'."

The manners of this species, from all that we can learn, appear to be very similar to those of the common wild boar; the most marked difference, if the statement of Sparrman be correct, as there is every reason to believe, consisting in its taking up its habitual residence in subterranean excavations, which it digs with its snout and hoofs.

BABIROUSSA.*

Frederick Cuvier has removed from the genus *sus* that remarkable animal the babiroussa, regarding it (we venture to think, upon very doubtful grounds) as the type of a distinct generic section, to which he has given the title of *babiroussa*. Baron Cuvier, in his last edition of the 'Règne Animal,' left it in the place to which Linnæus had assigned it, namely, among the genuine swine, from which it differs in no essentials, except indeed that the incisors are only four above instead of six, and that the molars are five on each side in either jaw.

There is every reason to believe that the ancients were acquainted with the babiroussa, as Pliny notices a wild boar found in India with horns on the forehead—a description very applicable to the present animal, whose long upper tusks, passing through the skin of the snout, curve round over the forehead so as to protect the head and eyes. We may also add that the term swine-deer (χοιμελαφος) was used by Cosmes, a writer in the sixth century, as the designation of an animal in India; and, as the meaning of the term coincides with the character of Pliny's horned boar, we have some grounds for supposing that each intended the same species.

* *Baba*, in the Malay language, means swine; *rusia*, stag.

However this may be, our acquaintance in modern times with the babiroussa is very limited: a native of the Moluccas, it is only occasionally that scientific Europeans have an opportunity of observing it in a state of nature, and of acquiring a personal knowledge of its habits. Skulls of the animal, indeed, are often imported into our country, brought over by vessels trading among the Moluccas, or touching at Java or Sumatra; but a specimen of the animal itself is rarely to be obtained; and we are not aware that a living individual has ever visited our shores. Some few years since we had the pleasure of examining a very fine specimen, forming part of a collection of objects of natural history, exhibiting at the Colosseum, and we were surprised to find its characters so different from those which most systematic writers have assigned to it.

In Shaw's 'General Zoology' (1801) it is stated to be covered, not with bristles, but with "fine short, and somewhat woolly hair, of a deep brown, or blackish colour, interspersed with a few bristles on the upper and hinder part of the back." On the contrary, we found that the skin, which was thick, coarse, warty, and black, was almost utterly destitute of covering—being sparingly beset with very short bristly hairs, imperceptible even to a close bystander, and not to be discovered unless by a careful examination. The skin, indeed, in texture and appearance, except that it did not fold into plates of armour and was black, bore a near resemblance to that of the rhinoceros, being tuberculated and wrinkled. Lesson, who informs us that he examined many specimens at Sourabaya, in the island of Java, describes the skin precisely as we found it—namely, black and furrowed, and furnished with only a few scattered hairs; but he says that the general contour of the body is robust and massive; whereas it ap-

peared to us to differ from that of the hog in being less massive, in the limbs being comparatively longer, and the head shorter and narrower. The tail was of moderate length, and tapered to a slender point; the ears were short, erect, and pointed. The tusks or canine teeth of the babiroussa are extraordinary both in their form and position; those of the upper jaw do not pass out between the lips as in the hog, but cut through the skin, half way between the eyes and the end of the snout, so as to appear like horns growing in an unusual situation. If we examine the skull, we find that the *alveoli* or sockets, from



Skull of Babiroussa.

which these tusks proceed, are directed obliquely upwards by the side of the maxillary bone, and covered with the integuments; so that as the tusks rise, the direction of their growth being upwards, they necessarily cut through the skin, as a sort of gum, and appear in the position described. Instead of being stout and strong, they are slender, of great length, and, rising vertically, curve round with a slight inclination outwards, so as to form half or three parts of a circle, which often touches the forehead. The tusks of the lower jaw are sharp and powerful, and

proceed between the lips; they are of considerable length, and bend upwards and outwards, being in fact most formidable weapons; their texture, as that also of the recurved tusks of the upper jaw, is fine-grained ivory. The situation and shape of the upper tusks renders them useless as weapons; and the intention of nature in giving to the babiroussa such remarkable instruments is not very apparent. It has passed current, on insufficient authority, that the animal employs them as hooks, by means of which, applied to a branch, it supports itself when sleeping or resting in the forest—an explanation evidently suggested by their shape, and not deduced from personal observation; for when, as is often the case, the curling tusks press upon the forehead, how is it then possible for the animal to hook them upon a branch, unless indeed it be so aptly placed and formed as to allow of being threaded through them? It is conjectured that their use may consist in protecting the eyes and head of the animal as it urges its way through the dense and tangled underwood of the forest; but, unfortunately for this, and, indeed, the former explanation, they exist, or rather perhaps are developed, only in the male; a circumstance proving that their presence, or, at least, their extraordinary growth, is to be regarded as a sexual distinction peculiar to the male, and in the same light as the tusks of the horse, which are wanting in the mare; for it must be observed that, where the same organs exist in both sexes, the development is far greater in the male than the female,—witness the tusks in the male and female swine; and also we may remark that, without any apparent specific use, organs are often peculiar to the male, and developed only when he shall have attained maturity. Of this the huge callosities on the cheeks of the great pongo or oran-outang of Borneo are an in-

stance in point. The use of the upper tusks of the babiroussa as hooks appears first to have been suggested by Valentine, in an account of the animal in his History of the East Indies; and it was from a translation of this, which fell into Pennant's hands, that, as he himself informs us, he borrowed the following succinct description, in which, as will be seen, this strange use of the tusks is detailed. The passage is as follows:—"Inhabits Booro, a small isle near Amboina, but neither on the continent of Asia or Africa. What M. de Buffon takes for it (in Africa, we suppose) is the Æthiopian boar. They are sometimes kept tame in the Indian isles; live in herds, have a very quick scent, feed on herbs and leaves of trees, never ravage gardens like other swine. Their flesh is well tasted. When pursued and driven to extremities rush into the sea—swim very well and often dive—in the forests often rest their head by hooking their upper tusks on some bough. The tusks, from their form, are useless in fight."

Lesson notices the fondness of the babiroussa for water, and the ease with which it swims. He says it inhabits the marshy forests in the interior of the isle of Booro (one of the Moluccas), and feeds chiefly upon maize, giving preference to that grain beyond other articles of diet. Its natural temper is wild and savage, and, when domesticated, it is said to preserve its ferocity and impatience, remaining almost perfectly intractable. Besides being destitute of tusks, the female is smaller than the male: Lesson, indeed, states the difference in size to be very considerable. Besides Booro, it would appear that the babiroussa inhabits Amboina, Java, Sumatra, and others of the adjacent islands, and is said to cross without difficulty the straits intervening between such as are tolerably close together.

The ordinary voice of this animal resembles that

of the hog; but when irritated or enraged it utters a strong deep hoarse growl.

We have seen no perfect drawing of the *babiroussa*: that in Buffon's work is copied from Pennant's figure, and is very indifferent.

PHACOCÆRUS, OF AFRICAN BOAR.



African Boar. (From specimen in Zoological Society's Museum.)

Africa contains two animals, so hog-like in manners, form, and aspect, that, were it not for the peculiarity of their dentition, they would necessarily be included in the genus *sus*. This peculiarity of dentition, however, suffices to justify their separation into a distinct genus, to which F. Cuvier has given the title of *Phacochærus*. Instead of presenting the ordinary structure, the grinders approach to that for

which the elephant is distinguished, being composed of vertical cylinders of enamel, inclosing an osseous deposit, and compacted together by *crusta petrosa*: nor is this all, they advance in rotation from behind forwards, as in the elephant, a circumstance no less remarkable than their composition. With regard to their number, they appear to vary: five on each side above, and four below, is the number laid down by writers generally; but in the skull of a species from Abyssinia (*Phacochærus Æliani*), the molars were found by us to be only four on each side above, and three below. From the first molar, which was very small, to the third, the increase in size was gradual, but the fourth molar was very long, and narrowed gradually as it proceeded backwards. The incisors are two above and six below, the intermediate lower incisors being smaller than the rest, and apart from each other. It would seem, however, that the presence of incisors is not invariable, for in the South African species they either do not exist, or are undeveloped. Cuvier states that vestiges are sometimes found under the gum; while in specimens from Cape Verde the incisors are generally complete. The canines, or tusks, are of enormous magnitude. The head is large and heavy, the eyes small, and set high on the forehead, which is depressed between them; under each eye hangs a large, coarse, fleshy lobe, and a warty excrescence appears on each side of the muzzle between the eye and the tusks. The muzzle is very broad, the ears erect, the general figure that of the hog.

The African boar (*Phacochærus Africanus*, Desm., *Aper Æthiopicus*, Pall.), or vlacke vark of the Cape colonists, has a widely extended range, being found in the interior of the Cape colony, at Cape Verde in Senegal, and in Guinea; at least, if the species be the same, which Cuvier seems to doubt. With

respect to habits and manners, this savage and formidable animal differs in no respect from the hog. The following description is taken from Dr. Andrew Smith's 'African Zoology':—

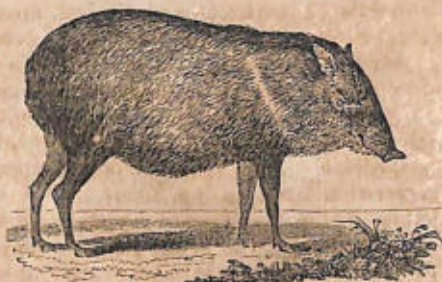
“Top of the head, the upper part of the neck, and the anterior part of the back, covered with very long and rigid bristles of a black-brown colour, those on the top of the head diverging like the rays of a circle. On the other parts the hair is shorter, of a dull brown, slightly inclined to white on the flanks and belly. Tail furnished at the top with a number of blackish-brown bristles, elsewhere nearly naked. Length from nose to root of tail about five feet; length of tail eleven inches.

“Inhabits the interior of Cape colony. Rather rare.”

The Abyssinian species, or *Phacochoerus Æliani*, Rupp., agrees in habits and manners with the previous species; the incisor teeth, two above and six below, are well developed. A fine specimen brought from Abyssinia by Dr. Ruppell is preserved in the museum of the Zoological Society.

PECCARY.—Gen. *Dicotyles*, Cuv.

The genus *dicotyles* is peculiar to South America, where it may be regarded as taking the same place in the forests of the New World which is occupied by the genus *sus* in those of the older continents. Linnæus, indeed, and the earlier writers did not separate the peccary from the genuine hog, and a first glance at the animal would render the propriety of founding a distinct genus for its reception very questionable. Two species are known, the collared and the white-lipped peccary, both of which, in appearance and propensities, are closely allied to the swine. The contour of their head and body, their clothing of bristles, their gait, their grunt, their



Peccary.

habits of rooting in the earth, the mode in which, when angry, they erect their mane of bristles and clash their teeth, are all swine-like; they are also equally susceptible of domestication. So strong, in fact, is the resemblance between the peccaries and the hog that, as we have said, a first glance at them would make us hesitate as to the propriety of their separation. A number of minutiae, however, combine together which not only justify the division, but render it necessary. The dentition is different from that of the hog; the incisors of the upper jaw being *four* instead of *six*, and the molars in each jaw *six* on either side, while the tusks, which are of moderate size compared with those of the wild hog, instead of projecting with an upward curve from the sides of the mouth have the ordinary direction, those of the upper jaw downwards, those of the lower jaw upwards. They are sharp and effective weapons, but far less formidable than those of the boar.

The limbs are different: not only are they more slender, shorter, and more delicately turned than those of the hog, but there are only *three* toes on the hinder feet, the *outer toe* being *wanting*: nor is this all; the metacarpal and metatarsal bones, to which

the two middle or large toes are attached, are *consolidated* together so as to form a sort of *canon bone*, as in the ruminating animals; and, in accordance with this approach, the stomach is divided into various pouches or *sacculi*. The tail is wanting, or reduced to a mere tubercle; and a large glandular apparatus beneath the skin on the loins pours out from an orifice a secretion of disgusting odour.

Such then are the characters of the genus *dicotyles*, as distinguished from the genus *sus*: we may observe, in addition, that the ears are sharp and erect, the muzzle long, the head large, and the eyes small but lively. Linnæus was either acquainted with only one species, or he confounded the two together, under the name of *sus tajussu*, which he describes as a tailless hog with a glandular orifice on the back. It is to Azara that we owe the discrimination of the two species; they differ, indeed, considerably from each other in size, markings, and habits; yet not so much so as to have prevented the impression of M. de la Borde, that they were nothing more than distinct herds or races of one species. Buffon, indeed, only speaks of one species, which he terms "*Pecari*," or "*Tajacu*," and which, as the description and two very good figures prove, is the Collared Peccary or "*Tatetou*" of Azara; but he alludes in the course of his description to a dark-coloured or maroon hog, "*cochon maron*," observing that "the species of Peccary has continued unaltered, and has not intermingled with that of the '*cochon maron*;' for it is thus that they call the hog of Europe transported to and become wild in America: these animals meet together in the woods, and even go in company, without any further results." Now it would appear that this "*cochon maron*" of Buffon is the white-lipped Peccary or "*Tagnicati*" of Azara,

respecting the real character of which Buffon was in error.

“The hogs,” says Azara, “which Buffon believed to be the descendants of those transported by the Spaniards, are not hogs, but *Tagnicatis*, since the characters which he indicates relate exactly to these latter animals; namely, their wild existence in America, and the dark colour, a form of body more lumpy, the head thicker, and the hair coarser than in the domestic hog.” It is this species which is described by Sonnini, who states that in Guiana it is exclusively termed Peccary; but Azara observes that the Guaranis give indifferently the names of Couré or Tayazou to two animals of their country and also to the domestic hog, but nevertheless they do not cease to impose upon the two species of the country the respective names of *Tagnicati* and *Taytetou*, while they distinguished the hog derived from Europe by that of *Cochá*, apparently a corruption of *Cochon*, and equivalent to it. Hence it would seem that the word Tajacu, or rather Tajazou, has a general rather than a restricted or specific signification. “These three animals,” viz., the hog and the two species of Peccary, says Azara, “resemble each other both in external form, in the manner of walking, and in their taste for the same kind of food; inasmuch as they root in the ground, eat and drink in the same manner, erect their bristles in anger or terror, respire energetically, and grunt on being irritated.” “Besides this, the two indigenous species of Paraguay, when taken young, are domesticated with more facility than the wild boar; they go about at liberty, and follow persons, soliciting to be scratched, so that in a short space of time, and with no trouble, they are reduced to complete subjection. It is said, and I believe it, that their flesh is good, but that it is not so fat as that

of the hog: this is not to be wondered at, first, because they are not properly fed to become fat; secondly, because they are always covered with an infinite multitude of ticks which abound in the woods."

"We are assured that, when killed, the glandular orifice between the haunches must be removed, since, if this be not done, their flesh acquires a bad odour and taste. Nevertheless, the Indians eat it without this precaution." The tagnicati, or white-lipped peccary, differs in certain respects, as regards its habits, from the collared species. It is eminently gregarious, associating in bands of hundreds, which traverse the country in quest of food, unimpeded by rivers, which, however broad or rapid, they cross with the utmost ease, or by dense thickets, through which they force their passage. Should the cultivated lands of a colonial settler lie in their way, they completely devastate every field capable of affording them food: they plough up the ground in search of roots, they trample down and devour the corn, they destroy the enclosures, and leave a scene of destruction behind them. Nor is it safe to attack a numerous horde, united in a common cause, and prompt and resolute in self-defence: when alarmed or irritated, they make a loud clattering with their teeth, erect their bristles, and rush upon their assailant, who, unless he be out of their reach, in a tree, or on a swift horse, on which to escape, by flight, is immediately surrounded, thrown down, and torn to pieces. The fierce and powerful jaguar, or the puma, dare not, it is said, attack a troop thus united, though they often seize upon an unwary straggler ere the main body can arrive to the rescue.

D'Azara says that the tagnicati (or white-lipped peccary) inhabits the vast forests in troops directed by a principal leader, of course an adult male. To

this he adds that, when one of the troop "hears any noise, he gives notice of it by clattering his teeth, which is repeated by all the rest, who stop to investigate the matter. If they find that no danger threatens them, they continue their march without attempting any injury, as I have often myself experienced. But, if they are attacked, they unite and surround the man, the dog, or the jaguar, commencing the assault, and tear him to pieces if he do not mount a tree, or if he have not the good fortune to kill the chief or leader, for on this event they all take flight, which is not the case when numbers fall should the leader be safe." "It is said that the jaguar follows the troops of the tagnicati in silence, and that, seizing a favourable moment, he darts upon one of the hindmost, laying him prostrate in an instant; he then climbs a tree, whence he descends after a certain interval, and when all the troop has retired, to make his meal upon the carcase."

Mr. Schomburgk, in his account of an ascent of the river Berbice, gives the following description of an encounter with these animals, which he calls "*Kairounies*." "While the men were employed in cutting through a large mora-tree information was brought that a herd of kairounies, the large peccary or Indian hog, was feeding at a short distance from the river: all our guns were immediately put in requisition, and off we started, Acouritch the Carib armed with bows and iron-headed arrows in the van. I first came up with them, and found them in a pool of water, where they wallowed in the mire like our domestic hog; one appeared to stand watch, while the rest enjoyed the muddy bath, the young ones of various sizes keeping in the middle. When I was at a distance of fifteen yards, the sentinel observed me, the bristles on the back rose, and it turned towards me, chattering formidably with its

teeth; in the next moment it lay prostrate in the mud, pierced by a rifle-ball; but how can I describe the bustle, the rush, and the chattering of the tusks of upwards of two hundred, which immediately after were seen to seek security by rapid flight in the opposite direction? An Indian who had come up by this time fired after them and shot another, and the retreat was now perfect. I had loaded again, but hesitated a moment to wade through the swamp: the Arawaak Mathias requested me to give him my rifle and ammunition, and off he started with it. I heard him fire four or five shots shortly after at some distance on my right, and, while yet calculating how many of them might have told, I heard a rushing noise like a whirlwind approaching through the bushes: the peculiar growl and that awful clapping of the teeth did not leave me long in doubt as to its cause; it was evident the herd had divided and were coming directly towards me. I stood alone unarmed, and had not even a knife to defend myself. I know not yet how I climbed the lower part of a mora-tree, when by they rushed, their muzzles almost sweeping the ground, and their rough bristles on the back standing erect: they might have numbered fifty. They came and passed like a whirlwind, and before I had recovered from my astonishment I heard them plunge into the river and swim over to the opposite bank. The other hunters had not been so fortunate as I expected; excitement or fear made them miss, where it would have appeared almost impossible: including the one I had shot, three had been killed with guns, and one with an arrow; they were a most welcome addition to our stock, as we were already obliged to economise, and our endeavours to procure fish had not been successful."....."The liquor which flows out of the gland is highly offensive and peculiar both to male and female."....."The cry of

the *kairounie* when full grown is a grunt, but that of the younger ones resembles the bleating of a goat."

The white-lipped peccary (*dicotyles labiatus*, F. Cuvier) is larger than the collared species, and more robust in its proportions; its head is larger, the snout longer, and the nasal disc more expanded at the sides; the limbs are shorter and stouter, and the canines more developed.* It often measures three feet and a half in length, and weighs a hundred pounds. The general colour is black slightly grizzled; the bristles around the ears are long and full, as is also the mane along the neck and back. The sides of the upper lip, and the whole of the under lip are white, whence its Paraguay name *Tagnicati*, which signifies "white-jaw." The female breeds only once a-year, and produces but two at a birth, a circumstance in which the peccary materially differs from the hog, whether wild or domestic. In the young animal the livery has a striped appearance, as we see it in the young of the wild hog, but the stripes are lost in the course of a twelvemonth. The white-lipped peccary, as we have frequently noticed in captivity, has the general manners and habits of the hog. We have thought it to be more reserved and savage than the collared species, and more ready to testify by the clashing of the teeth its feelings of displeasure.

The collared peccary (*dicotyles torquatus*, Cuv.) is the patira of Sonnini, and, as we have said, the tayetou of Azara. This species, instead of associating in vast troops, which perform a sort of migratory march over extensive tracts of country, lives only in pairs, or at most in small bands or families, which seldom quit their native forest, subsisting on roots and other vegetable aliment, to which fish and reptiles are also occasionally added; and it is said that

they are dexterous in skinning snakes and lizards before devouring them: this observation, however, applies, we believe, both to the *tagnicati* and the present species. These two animals are, as we have intimated, confounded together by Buffon, who commits several errors in his description,—a description, except as regards the markings and external character of the animal, applicable rather to the white-lipped than to the collared peccary. Setting aside this confusion, there are two errors into which he has fallen which we cannot pass over. “These animals,” he observes, “occupy in their native country rather the mountains (*les montagnes*) than the low lands; they do not affect morasses and mire, as our wild boars.”

D’Azara’s comment on this statement is as follows:—“Buffon adds that the peccary prefers the mountains to the valleys, because he is ignorant that here (*viz.* Paraguay) by the term ‘*montagnes*’ are not meant heights or cordilleras, but immense forests which both species of peccary affect, whether in valleys, on plains, or on elevations.” Again, Buffon states that the peccary “brings forth a numerous litter, and probably more than once a-year.” Like the previous species, the collared peccary produces only two, and breeds only once yearly.

The odour of the present animal is, to the full, as disgusting as that of its congener; but it is not improbable that it differs in intensity at different seasons of the year. We think, indeed, that we have observed this to be the case in the specimens we have been in the frequent habit of seeing in captivity; at least we have had our nasal organs more powerfully affected on some occasions than on others; but we cannot agree with D’Azara in regarding it as “musky, sweet, and agreeable.” D’Azara adds, however, that it is probable that the dorsal gland

may exhale different odours according to the food of the animal, its state of irritation, and other circumstances.

The collared peccary displays nothing of the determined obstinacy of the white-lipped species in defending itself against enemies: not, we believe, that the latter animal is really more courageous than its congener, (for when stragglers are met they display nothing of the prowess of the wild boar,) but that they derive confidence from their number, associating as they do in vast herds,—while the collared species, going only in pairs or small families, wants that confidence which the co-operation of numbers imparts. Hence when attacked they take to flight, unless when driven to the last extremity and no mode of escape presents. Their retreats are the hollows of huge decayed trees, holes in the earth, and excavations of various kinds, and in these they seek a refuge from the pursuit of their enemies, among which, man excepted, the jaguar is the most formidable. Like the previous species, the present animal is extensively spread throughout the wooded portions of South America, and is, it would appear, more frequently to be met with; at all events it is more frequently brought over to our country, where it might no doubt be soon acclimatised, and a fellow-tenant with the hog of the sty, if its disagreeable odour, and the inferiority of its flesh to pork, both in delicacy and fatness, did not forbid the experiment. The collared peccary measures about three feet in length, and rarely weighs more than fifty pounds. The following description by the pen of Mr. Bennett is very accurate:—

“Its general colour is a yellowish gray, resulting from the manner in which the bristles are marked by alternate rings of grayish straw-colour and black. A row of long black bristles extends backwards from

between the ears, forming a somewhat erectile mane on the back of the neck, and becoming gradually longer as they approach the tail. The face is more grizzled with yellow than any other part, with the exception of a narrow oblique line of yellow pointed hairs, which passes from behind the shoulders to the fore part of the neck, and from which the specific name of the animal is derived. The colour of the legs, as well as of the hoofs, is nearly black. The ears are small, upright, nearly naked, and of a grayish colour. On the legs and muzzle the hairs are extremely short." For the first year the young present a uniform reddish-brown livery.

Bewick's figure and description of this species in his *History of Quadrupeds*, are both bad—indeed the latter is little besides a tissue of errors, whether as relating to one species or the other; nor in more modern works of a popular character do we in general meet with correct information respecting them. From this censure, however, we must except the 'Gardens and Menagerie of the Zoological Society delineated.'

CHAPTER VI.

THE OX.

*Chillingham Bull.*

AMONG the groups which compose the ruminating order of quadrupeds none occupy so important a situation, as far as the welfare and interest of man are concerned, as that comprising the ox and its immediate relatives, of which four or five distinct species, at least, are subject to his immediate dominion, and know him as their owner. These are the ox, the gayal, the buffalo, and the yak.

The ox (*Bos taurus*, Linn.) is now known only as a domestic animal, spread far and wide throughout every country of the globe, the bondslave of man, and one of the first triumphs of his power in modifying the habits and instincts of the brute creation. Of all his acquisitions it is the most valuable; it constitutes the wealth of nations; and from the earliest days to the present has engaged the serious attention of the philosopher and the statesman.

Although referred to as a domestic animal, almost from the dawn of man's career upon the globe, by the author of the Mosaic record, impenetrable darkness hangs over the primæval history of the ox. Nor in this point is it alone; the subjugation of the dog, and the reduction of the goat, the sheep, the horse, and the camel, to the service of man, are alike enveloped in obscurity. The times and all the attendant circumstances are unwritten in the records of nations, and vague surmises alone remain to the philosopher after all his labours in unravelling their primitive history.

The revolutions of years, a thousand circumstances—temperature, soil, food, and climate,—have all combined to effect a series of modifications in the ox. Every country possesses its peculiar races, and these races, by their intermixture, are perpetually producing others, so that it is impossible to say to what extent these changes may arrive, and how far the original type has become already modified. Certain it is, that we are acquainted with no animal in a state of original independence to which we can refer as the primitive type of the ox. It is true that a race of wild cattle existed in central Europe within the range of authentic history, to which the ancients gave the name of *urus*, distinct, as the accounts of Cæsar and others appear to indicate, from the animal termed *aurochs*, to which Gmelin applied the term

urus, and which is the bonassus of Aristotle, the bison of Pliny, and now called bisent, or wisent, in some of the districts of Germany. It is from this *ancient urus*, which was an animal of stupendous size and great ferocity, that Cuvier is inclined to derive our domestic race, regarding, at the same time, the semi-wild breed still lingering in some of our parks (the *Bos Scoticus*) as its immediate descendant.

The horns of this *ancient urus* are described as having been large and spreading—a character in which it decidedly differed from the aurochs, or bonassus, which still exists in Lithuania, and, as some suppose, also among the Caucasian mountains, in which the horns are moderate, or rather small; but the *urus* has now become extinct. The fossil remains of a species of ox, and among them heads and horns of huge size, occur in the superficial strata, not only in various parts of the adjacent continent, but also in our island; and these Cuvier considers to be the *reliquia* of the *ancient urus*, and, consequently, of the primitive type of the domestic ox. Mr. T. Bell, the author of the “History of British Quadrupeds,” evidently leans, and, we think, with reason, to the same opinion. “In this country,” he observes, “and in many parts of the continent, have occurred numerous fossil bones of oxen, with *large horns*, having the form and direction of certain breeds of our present cattle, and particularly of *such as are most wild*; as, for instance, the *celebrated wild white oxen* of Craven, of Chillingnam Park, and of Scotland, the *Bos Scoticus* of some authors. I cannot but consider it as extremely probable that these fossil remains belonged to the original wild condition of our domestic ox, an opinion which Cuvier appears to have entertained, who calls the skulls *crânes semblables à ceux d'un bœuf do-*

vestique. They are found only in very recent deposits, frequently in caverns, mingled with the remains of various other animals; as in the celebrated cave of Kirkdale, and in different parts of Cornwall and of Devonshire. I have several teeth and some fragments of bones from Kent's Hole, in the latter county, where they were found in the same mass with the remains of the elephant, the rhinoceros, the deer, the bear, and the hyæna. Cuvier, however, considers that they existed after the destruction of the latter species.

“It has indeed been attempted to prove that the ancient remains alluded to, together with the Chillingham and Scottish breed, belong to a distinct specific type from the common domestic ox; and some modifications have been cited in proof of this opinion. It does not appear to me, however, that these modifications are of sufficient value to constitute specific distinction, as they appertain only to parts which are very variable in particular breeds of the domestic cattle. There are some slight differences in the form and direction of the horns, and the existence in *old bulls* of a short rudimentary mane, and some hair upon the breast. Now there is certainly no point of sufficient importance to form a specific distinction, even were the form of the horns less variable than they are on our domestic oxen. We require yet a series of well-authenticated and well-directed experiments on the intermixture of the Scottish or Chillingham cattle with the domestic breeds, and the fertile or infertile character of the progeny, which, if the views I have so repeatedly advanced on this subject be correct, would at once decide the question. Even Colonel Smith himself, a high authority on these matters, although he urged the specific distinction of the two animals, says, ‘The character of the domestic oxen is absolutely the same as

the fossil, and the wild breeds differ only in the flexure of the horns and external appearance, occasioned by the variations of climate, food, and treatment." But, it may be asked, do variations of climate, food, and treatment produce *specific* distinctions? And yet this distinction is, as I have just stated, held both by Colonel Smith and Mr. Swainson. Upon the whole, I cannot but believe that the fossil bones belonged to the original stock of our domestic ox, and that the wild cattle, the *Bos Scoticus* and *Urus Scoticus* of the authors just named, approaches so near to it as to leave it a matter of doubt, *not* whether they all belong to the same species, but whether this breed be the actual remains of that original stock, or the descendants of domesticated individuals, which have resumed in a great degree their wild character from having ceased through many generations to feel the effects of human domination."

Mr. Youatt, in his admirable work on 'Cattle,' (Library of Useful Knowledge), adverting to the identity of the wild breed with our domestic races, observes, " Britain has shared the fate of other nations; and oftener than they, though defended by the ocean on every side, she has been overrun and subjugated by ferocious invaders. As the natives retreated before the foe, they carried with them some portion of the wreck of their property. We have stated that their property in early times consisted principally of cattle. They naturally drove along with them as many as they could when they retired to the fortresses of North Devon and Cornwall, or the more mountainous regions of Wales, or when they took refuge in the wealds of East Sussex; and, there retaining all their prejudices and customs and manners, they were jealous of the strict preservation of that which principally reminded them of their native country before it had yielded to a foreign yoke. In this

manner probably was preserved the ancient breed of cattle. Difference of climate gradually wrought some change, and particularly in their bulk. The rich pasture of Sussex fattened the ox of that district into his superior size and weight. The plentiful but not so luxuriant herbage of the north of Devon produced a smaller and more active animal, while the occasional privations of Wales lessened the bulk and thickened the hide of the Welsh runt. As for Scotland, it in a manner set its invaders at defiance, or its inhabitants retreated for a while, and soon turned again on their pursuers. They were proud of their country, proud of their cattle, their choicest possession; and there too the cattle are unmixed and undegenerated. The slightest observation will convince us that the cattle in Devon, Sussex, Wales, and Scotland, are essentially the same. They have all the characters of the same breed changed by soil and climate and time, yet little changed by the intermeddling of man. Every one who has had opportunities of comparing the Devon cattle with the wild breed of Chatelherault Park, or Chillingham Castle, has been struck with the great resemblance in many points, notwithstanding the difference in colour, while they bear no likeness at all to the cattle of the neighbouring country." In another place the same writer says, "To the principality we naturally look for some trace of the native breed of cattle, for the Welsh were never entirely subdued by any of the early invaders. The Romans possessed merely a portion of the country; the Saxons scarcely penetrated at all into Wales, or not beyond the county of Monmouth; the Welsh long resisted the superior power of the English under the Norman kings; and it was not until late in the thirteenth century that the principality was annexed to the crown of England. We therefore expect to find

more decided specimens of the native productions of our island: nor are we altogether disappointed. Howell Dha, or Howell the Good, describes some of the cattle in the tenth century as being *white with red ears*, resembling the wild cattle of Chillingham Castle. An early record speaks of a hundred white cows with red ears, being demanded as a compensation for certain offences against the princes both of North and South Wales. If the cattle were of a *dark or black colour*, 150 were to be presented. When the Cambrian princes did homage to the king of England, the same number of cattle, and of the same description, were rendered in acknowledgment of sovereignty. Speed tells us that Maud de Breos, in order to appease King John, whom her husband had offended, sent to his queen a present from Brecknockshire of 400 cows and a bull, all white with red ears. Whether this was the usual colour of the ancient breed of Welsh and British cattle, or a rare variety esteemed on account of its beauty, and chiefly preserved in the parks of the nobles, we are unable to determine. The latter is the most probable supposition; and the same records that describe the *white cattle with red ears* speak also of the *dark or black coloured breed*, which now exists, and which is general throughout the principality." As a further point in favour of the probability of the white wild cattle being specifically the same as our domestic races, we select the following quotation from the work above referred to:—"The colours of the *improved short-horns*, are red or white, or a mixture of the two, combining in endless variety and producing very frequently a most brilliant effect. The white it is very probable they obtained from an early cross with the *wild breed*, and whenever this colour shows itself it is accompanied more or less with a red tinge on the extremity of the ear, a distinctive

character also of the wild cattle." From these extracts we can have no doubt as to the opinion of Mr. Youatt respecting the real nature of the white wild breed of our island, between which and the animal *urus* there is, as most naturalists admit, the closest affinity, granting that the fossil skulls belonged to the latter animal.

In this point of view the wild cattle of Chatelherault Park, Lanarkshire, of the park of Chillingham Castle, Northumberland, and a few other parks, acquire a peculiar interest. It is not long since they abounded in the larger parks of England and Scotland; a breed at or lately at Craven, Yorkshire, are said to have been originally brought from Whalley Abbey, in Lancashire, upon its dissolution in the thirty-third of Henry VIII. At a still more early period they haunted the woods and uncultivated portions of the country; and many are said to have harboured in the forests in the neighbourhood of London: as the forests became cleared, and the wild parts of the country cultivated, they became gradually thinned, till at length their remnant found in the chase or park of the nobleman that safety which as old denizens of the soil they might well claim, and but for which the magnificent breed would long since have perished. The following description by Mr. Culley (in his observations on live stock), though often quoted, well deserves a place here:—"The wild breed, from being untameable, can only be kept within walls or good fences, consequently very few of them are now to be met with, except in the parks of some gentlemen, who keep them for ornament and as a curiosity. Those I have seen are at Chillingham Castle in Northumberland, a seat belonging to the Earl of Tankerville. Their colour is invariably of a creamy white; muzzle black; the whole of the inside of the ear, and about

one third of the outside from the tips downwards, red; horns white with black tips, very fine and bent upwards; some of the bulls have a thin upright mane about an inch and a half or two inches long. The weight of the oxen is from thirty-five to forty-five stone, and the cows from twenty-five to thirty-five stone, the four quarters (fourteen pounds to the stone). The beef is finely marbled and of excellent flavour. From the nature of their pasture, and the frequent agitation they are put into by the curiosity of strangers, it is scarcely to be expected they should be very fat; yet the six-year-old oxen are generally very good beef, from whence it may be fairly supposed that in proper situations they would feed well.

“At the first appearance of any person they set off in full gallop, and at the distance of about two hundred yards make a wheel round and come boldly up again, tossing their heads in a menacing manner; on a sudden they make a full stop at the distance of forty or fifty yards, looking wildly at the object of their surprise; but upon the least motion being made they all again turn round and fly off with equal speed, but not to the same distance, forming a shorter circle, and, again returning with a bolder and more threatening aspect than before, they approach much nearer, probably within thirty yards, when they again make another stand, and then fly off: this they do several times, shortening their distance and advancing nearer and nearer, till they come within such a short distance that most people think it proper to leave them, not choosing to provoke them further. The mode of killing them was perhaps the only remains of the grandeur of ancient hunting. On notice being given that a wild bull would be killed on a certain day, the inhabitants of the neighbourhood came, mounted and armed with guns, &c.,

sometimes to the amount of a hundred horse and four or five hundred foot, who stood upon walls or got into trees, while the horsemen rode off the bull from the rest of the herd, until he stood at bay, when a marksman dismounted and shot. At some of these huntings twenty or thirty shots have been fired before he was subdued. On such occasions the victim grew desperately furious, from the smarting of his wounds, and the shouts of savage joy that were echoing on every side. But, from the number of accidents that happened, this dangerous mode has not been practised of late years; the park-keeper alone generally shooting with a rifle-gun at one shot. When the cows calve they hide their calves for a week or ten days in some sequestered situation, and go and suckle them two or three times a day. If any person come near the calves, they clap their heads close to the ground, and lie like a hare in form, to hide themselves: this is a proof of their native wildness, and is corroborated by the following circumstance, that happened to Mr. Bailey of Chillingham, who found a hidden calf, two days old, very lean, and very weak. On stroking its head, it got up, pawed two or three times like an old bull, bellowed very loud, stepped back a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before; but, knowing its intention and stepping aside, it missed him, fell, and was so very weak that it could not rise, though it made several efforts; but it had done enough. The whole herd were alarmed, and, coming to its rescue, obliged him to retire, for the dams allow no person to touch their calves without attacking them with impetuous ferocity. When any one happens to be wounded, or is grown weak and feeble through age or sickness, the rest of the herd set on it and gore it to death."

In this breed, then, we see the last relics of a wild race, which in past ages tenanted the British forests, contending with the wolf and the bear. Reclaimed from this race, at least so we may naturally presume, were the herds of cattle which constituted the main wealth of the Britons when Julius Cæsar first landed on this "ultima Thule" of the Roman conquests; but here the question returns,—are we to attribute to this stock the primitive origin of the domestic ox in all countries? is the zebu a reclaimed *urus* or, in fact, have the breeds peculiar to different countries a different origin? In whatever way we answer the question, we find ourselves environed with difficulties. If we say that the *urus* is the type of the domestic ox throughout the globe, then, might we not look for a close resemblance to it in the races peculiar to the regions in which man first began the trial of domestication? would not the races descending in a direct line from it bear the impress of their original? But the ox of Asia seems more remote, more modified than our British cattle. If, on the other hand, a distinct origin be assumed for races widely unlike each other, but which yet breed together, producing an offspring fertile *inter se*, then must it be admitted that species originally distinct may yet be so cognate as to be capable of being ultimately blended together. Many reasons induce us to incline to the latter theory.

The earliest records we possess introduce the ox to our notice as a domestic animal; and that at a period of remote antiquity. In the fourth chapter of the Book of Genesis, v. 20, we read of Jabal, that "he was the father of such as dwell in tents, and of such as have *cattle*." In the thirteenth chapter of the same book cattle are enumerated as constituting part of the riches of Abram and also of Lot; and in the previous chapter we read that oxen were pre-

sented by the Pharaoh of Egypt, together with sheep, asses, and camels, to Abram, during his sojourn in that land. In the eighteenth chapter, *veal*, or the flesh of the calf, and *butter* and *milk*, are mentioned as articles of food. Afterwards, chapter xxiv., flocks and herds and asses are again recounted as forming part of the wealth of Abraham as well as camels; but no mention is made of the horse till the famine of Egypt, when Joseph the son of Jacob was a ruler in Egypt under Pharaoh, and in this instance the horse is described as being part of the property exchanged by the natives of Egypt for corn (see Genesis chapter xlvii. v. 17), and not by the sons of Israel. From this it appears that, though the horse was known and had then been perhaps long domesticated, it was not reclaimed at so early a date as was the ox, nor so generally spread; perhaps, indeed, the original domestication of the horse may be attributed to the Egyptians, who are the first people on record as using this animal in warfare, horsemen and chariots forming the strength of their armies.

That the ox continued in a wild condition in Syria and the adjacent regions is evident from a passage in the Mosaic injunctions regarding animals to be used as food (Deut. xiv. 5). The *wild ox* is there expressly noticed;—Isaiah alludes also to the *wild bull* (“as a wild bull in a net”). From these notices, if we learn nothing else, we learn that the wild ox existed in the regions occupied by the Israelites, and that a domestic breed, reclaimed at a period antecedent to historic record (the Scripture outline excepted), was part and parcel of the wealth of man in the primeval ages.

The usefulness of the ox, and its great importance were well appreciated from the earliest epoch, inasmuch that it became an emblematic object of worship among most of the nations of antiquity. The Israel-

ites, perhaps infected by the idolatry of the Egyptians, made the calf a deity, and worshipped its golden image—an outrage against the laws demonstrative of the pervading feeling. The Mosaic ritual lays down express injunctions respecting the treatment of this animal, and the records of the Jewish people give us an insight into the uses to which it was applied in the earliest ages. Of these one of the most remarkable is implied in the following passage: "Thou shalt not muzzle the ox when he treadeth out the corn" (Deut. xxv. 4). The first idea suggested by this passage is, that the operation of threshing was effected simply by the feet of the cattle passing over the sheaves; and such, indeed, was the case in the times of patriarchal simplicity. Afterwards, as other passages show, rollers or wheels of wood were used; these were drawn over the sheaves by oxen, and greatly facilitated the process. In Isaiah we read of a sharp threshing instrument having teeth; in Chronicles (xxi. 23) of "threshing instruments of wood." Isaiah has also the following passage (xxviii. 27): "The fitches are not threshed with a threshing instrument, neither is a *cart-wheel turned about* upon the cummin; but the fitches are beaten out with a staff, and the cummin with a rod; bread-corn is bruised because he will not be ever threshing it, nor break it with the wheels of his cart, nor bruise it with his horsemen." With respect to the primitive mode of threshing, by means of the feet of oxen, there is an express allusion to it in Homer, which proves that the practice was common in his time and country:—

"As with autumnal harvests cover'd o'er,
 And thick bestrewn, lies Ceres' sacred floor,
 Where round and round with never wearied pain
 The trampling steers break out th' unnumber'd grain."—
Pope's Tr. Homer's Iliad, xx.—(line of orig. 495, 7.)

The ancient Arabs, Egyptians, and Romans, as well as the ancient Greeks, threshed their corn in this manner; Virgil (Georg. lib. i. line 177) describes the manner in which the threshing-floor is to be laid down, a manner showing that nothing like the modern plan of threshing could have been used. He directs that "the threshing-floor must be well levelled with a huge cylindric roller, and worked with the hand, and consolidated with binding chalk, that weeds may not spring up, and that it may not become dusty or full of chinks, with drought." Dr. Shaw in his Travels informs us that "the Moors and Arabs continue to tread out their corn after the primitive manner of the East. Instead of *beeves*,^{is} they frequently make use of mules and horses, by tying them in the like manner by the neck, three or four of them together, and whipping them afterwards round by the *neddars* (as they call the threshing-floors, the *Libycæ areæ** of Horace), where the sheaves lie open and expanded, in the same manner as they are placed and prepared by us for threshing. This indeed is a much quicker way than ours, but less cleanly, for, as it is performed in the open air (Hos. xiii. 3.), upon any round level plat of ground, daubed over with cow's dung, to prevent as much as possible the earth, sand, or gravel from rising, a great quantity of them all, notwithstanding this precaution, must unavoidably be taken up with the grain; at the same time, the straw, which is their only fodder, is hereby shattered to pieces,—a circumstance very pertinently alluded to, 2 Kings xiii. 7, where the king of Syria is said to have made the Israelites like the dust by threshing." (*Shaw's Travels*). The second mode of threshing corn (that is, partly by means of the feet of oxen, and partly by means of a roller or

* " . . . si proprio condidit horreo

" Quidquid de *Libycis* verritur *areis*.—Hor. *Carm.* 1. Ode i.

other machine which the oxen draw after them) is still practised in Egypt, Syria, and other parts of the East, where primitive habits and customs have undergone but little change. Norden (see his Travels in Egypt and Nubia) observes that they "thresh or rather tread rice in Egypt by means of a sledge drawn by two oxen; and in which the man who drives them is on his knees, whilst another man has the care of drawing back the straw, and of separating it from the grain that remains underneath. In order to tread the rice, they lay it on the ground in a ring, so as to leave a little void circle in the middle." Niebuhr (see his Travels) observes of the Egyptians, "that they use oxen as the ancients did to beat out their corn by trampling upon the sheaves, and by dragging after them a clumsy machine. This machine is not, as in Arabia, a stone cylinder, nor a plank with sharp stones, as in Syria; but a sort of sledge consisting of three rollers, fitted with irons, which turn upon axles. A farmer chooses a level spot in his fields, and has his corn carried thither in sheaves, upon asses or dromedaries; two oxen are then yoked in a sledge, a driver gets upon it and drives them backwards and forwards, rather in a circle, upon the sheaves; and fresh oxen succeed in the yoke from time to time; by this operation the chaff is very much cut down. The whole is then winnowed, and the pure grain thus separated. This mode of threshing out the corn is tedious and inconvenient; it destroys the chaff and injures the quality of the grain." In another place the same writer says, "This machine is called *nouridsj*. It has three rollers, which turn on their axles; and each of them is furnished with some irons, round and flat. At the beginning of June M. Föfskal and I several times saw, in the environs of Dsjise, how corn was threshed in Egypt. Every peasant chose

for himself in the open field a smooth plot of ground from eighty to a hundred paces in circumference: hither was brought on camels or asses the corn in sheaves, of which was formed a ring of six or eight feet wide and two high. Two oxen were made to draw over it again and again the sledge above mentioned; and this was done with the greatest convenience to the driver, for he was seated in a chair fixed in the sledge. Two such parcels or layers of corn are threshed out in a day, and they move each of them as many as eight times with a wooden fork of five prongs, which they call *meddre*. Afterwards they throw the straw into the middle of the ring, where it forms a heap which grows bigger and bigger. When the first layer is threshed they replace the straw in the ring and thresh it as before. Thus the straw becomes every time smaller, till at last it resembles chopped straw. After this with the fork just described they cast the whole some yards from thence, and against the wind, which driving back the straw, the corn and the ears not threshed out fall apart from it, and make another heap. A man collects the clods of dirt, or other impurities, to which any corn adheres, and throws them into a sieve. They afterwards place in a ring the heaps, in which a good many entire ears are still found, and drive over them for four or five hours together a dozen pair of oxen joined two and two, till by absolute trampling they have separated the grains, which they throw into the air with a shovel to cleanse them."

According to the same writer, the Arabians yoke two oxen, which drag a large stone over the sheaves; and Dr. Russell states that near Aleppo the corn is dislodged from its husks by a machine like a mill, which runs upon two or three rollers, drawn by horses, cows, or asses. In these rollers are fixed

two iron wheels notched like the teeth of a saw and pretty sharp, at once cutting the straw and separating the grain.”*



From Flarman's designs for the Shtola of Achilles.

In the earliest ages, as also in modern times, the ox not only laboured in the cart, but also drew the plough, a service to which the horse was not then devoted, but for which it is now, at least in England, most commonly used; though in some counties, as Devonshire, &c., the ox still labours at this important work, and in a great measure supersedes the horse. Allusions to oxen engaged in this labour are abundant both in the Scriptures and in the writings of the ancient classics. The primitive plough appears to have been very simple, consisting of nothing more than a crooked piece of wood; and in the East it still continues a rude, and, as we should think, an inconvenient instrument, capable of being used with effect only on soft loose soil. The coulter of the *Egyptian plough* is a broad flat piece of iron, obliquely raised on its edge, but neither large nor heavy, and evidently requiring the continued pres-

* Bishop Heber noticed that in India the ancient mode of treading out the corn with oxen is still in general adoption; they are driven over the sheaves, round and round in a circle and are not muzzled,—but, being kept constantly moving, they can only snatch a mouthful of straw now and then during the performance of their labour.



Ancient Ploughs.

sure of the ploughman in working it effectively. The same observation equally applies to the earlier Greek and Roman ploughs, which, as we see represented on gems or sculpture, were very simple. Hence the expression of Pliny, "arator, nisi incurvus, prævaricatur,"—the ploughman, unless he bends over the plough, makes a balk, *i.e.* does not keep it steadily and uniformly in the ground. Virgil (see *Georgics*, lib. i. line 169 et seq.) thus describes the preparation of a plough which it would seem the farmer himself was accustomed to manufacture, but which is certainly less simple than that used at an earlier period and represented on medals or gems:—

“Continuo in sylvis magnâ vi flexû, domatur
 In burim, et curvi formam accipit ulmus aratri
 Huic a stirpe pedes temo portentus in octo,
 Binæ aures, duplici aptantur dentalia dorso.
 Cæditur et tilia, ante iugo lævis, altaque fagus
 Stivæ, quæ currus a tergo torqueat imos.”*

A plough much resembling that described by Virgil is still in use in Italy; the share-beams, (*dentalia*) are joined to the two handles, and form the double backs.

In many parts of continental Europe the ox is still almost exclusively employed in the cultivation of the soil, and though, as we have observed, its use in our island is to a great extent superseded by that of the horse, still it is far from being entirely so, and the ox-team may be often seen toiling at the plough with patient and submissive perseverance. Mr. Youatt observes, that “Where the ground is not too heavy the Devonshire oxen are unrivalled at the plough; they have a quickness of action which no other breed can equal, and which very few horses exceed. They have also a degree of docility and goodness of temper, and also stoutness and honesty of work, to which many teams of horses cannot pretend.” Vancouver, in his Survey of Devonshire, says, “It is a common day’s work on fallow-land for four steers to plough two acres with a double-furrow plough. Four good Devonshire steers will do as much work in the field or on the road as any three horses, and in as quick or often quicker time, although many farmers calculate two

* *Translation.*—Straightway, in the woods, an elm bent with vast force is fashioned into the ploughtail, and receives the form of the crooked plough. To this at the lower end a beam eight feet in length, two earth-boards, and share-beams with their double back, are fitted; the light lime is also felled before-hand for the yoke, and so is the tall beech for the plough-staff to turn the bottom of the carriage behind.

oxen to be equal to one horse. The principal objection to the Devonshire oxen is, that they have not sufficient strength for tenacious clayey soils: they will however exert their strength to the utmost, and stand many a dead pull, which few horses could be induced or forced to attempt. They are uniformly worked in yokes and not in collars. Four oxen or six growing steers are the usual team employed in the plough. There is a peculiarity in driving the ox team which is very pleasing to the stranger, and the remembrance of which, connected with his early days, the native does not soon lose. A man and a boy attend each team: the boy chants that which can scarcely be regarded as any distinct tune, but which is a very pleasing succession of sounds resembling the counter-tenor in the service of the cathedral. He sings away with unwearied lungs as he trudges along almost from morning till night, while every now and then the ploughman, as he directs the movement of the team, puts in his lower notes, but in perfect concord. When the traveller stops in one of the Devonshire valleys, and hears this simple music from the drivers of the ploughs on the slope of the hill on either side, he experiences a pleasure which this operation of husbandry could scarcely be supposed to be capable of affording. This chanting is said to animate the oxen somewhat in the same way as the musical bells that are so prevalent in the same county. Certainly the oxen move along with an agility that would scarcely be expected from cattle; and the team may be watched a long while, without one harsh word being heard, or the goad or the whip applied. The opponents of ox-husbandry should visit the valleys of North and South Devon to see what this animal is capable of performing and how he performs it."

In former times it seems to have been customary

to employ at one plough only a yoke of oxen, or, in other words, a pair. "Elisha was ploughing with twelve yoke of oxen before him, himself being at work with the twelfth pair." (1 Kings xix. 19.) But then the amount of labour was proportionate. Buffon says truly, when he observes, "The ancients limited to 120 paces at most the extent of the furrow, which the ox ought to trace by an uninterrupted continuance of efforts and movement; after which, say they, one ought to cease urging him on, but permit him to take breath for some moments before carrying out the same furrow, or beginning another. But the ancients made the study of agriculture one of their pleasures, and gloried in labouring themselves, or, at least, in favouring the labourer, and sparing the toil of the husbandman and of the ox; while, among us, those who enjoy the largest share of landed property are the persons the least ready to estimate, encourage, and sustain the art of cultivating it."

The utility and value of the ox, acknowledged in primitive times, and peculiarly felt by nations rising from barbarism to a certain stage of civilization, led among many to a regard for it more than bordering on idolatry. "The traditions of every Celtic nation," says Mr. Youatt, "enrol the cow among the earliest productions, and represent it as a kind of divinity." Among the Egyptians the god Apis was worshipped in the form of a bull. Herodotus (*Thalia*, iii.) says, "This Apis, or Epaphus, is the calf of a cow incapable of bearing another, and no otherwise to be impregnated than by thunder, as the Egyptians affirm. The marks that distinguish him from all others are these:—his body is black, except one square of white on the forehead; he has the figure of an eagle on his back, a double list of hair on his tail, and a scarabæus under his tongue." To the god thus personified other bulls are sacrificed. The same

writer (Euterpe, ii.) says of the Egyptians, "They sacrifice bulls to Apis, and for that reason make the following trial. If they find one black hair upon him, they adjudge him to be unclean; which, that they may know with certainty, the priest appointed to this purpose views every part of the animal, both standing and laid down on the ground. After this, he draws out the tongue, to see if he be clean, by certain signs, which I shall mention in another discourse. In the last place he looks upon the hairs of his tail, that he may be sure they are as by nature they ought to be. If, after this search, the beast is found unblemished, he ties a label about his horns, and, having sealed it with the signet of his ring, orders him to be led away and secured; because it is death to sacrifice one of these animals unless he has been marked with such a seal; and thus, having related the form of this examination, I proceed to the manner of their sacrifices. After they have brought the victim to the altar, they immediately kindle a fire, and, pouring wine upon him, offer their prayers to the god. This done, they kill the beast, flay the body, and cut off the head, which they carry with many imprecations to the public place, if they have any, and sell it to some Grecian merchant; but, if no such is to be found, they throw it into the river, using this form of execration—*May all the evils impending over those that now sacrifice, or over the Egyptians in general, be averted on this head!* The ceremonies of the libation of wine, and the manner of devoting the head of the sacrifice, are practised in all the temples of Egypt, and for this reason, no Egyptian will eat the head of any animal. But in the choice of their victims and burnt offerings they have different customs in several places."

The goddess Isis was represented by the Egyptians as the figure of a woman with the horns of a

cow on her head, as the Grecians represented Io; and the sacrificial offering is a bullock—the cow, being sacred to Isis, was never sacrificed. Herodotus thus describes the ceremony:—"On the preceding day they fast, and, after having prayed, they sacrifice a bullock, taking out the bowels, and leaving the fat, with the vitals, in the carcase. This done, they cut off the legs and end of the loin, together with the shoulders and neck; and, having filled the body with fine bread, honey, dried raisins, figs, incense, myrrh, and other perfumes, they perform the rites of consecration, and pour in a great quantity of oil. They sacrifice fasting, beating themselves during all the time the flesh lies on the fire, and, when they have so done, they feast on the rest of the offering." The veneration for the ox, and especially the cow, was not confined to the Egyptians, but prevailed among many of the adjacent nations. "The Libyans," says Herodotus (*Melpomene*, iv.), "from Egypt to the lake Tritonis, are breeders of cattle, eat flesh, and drink milk, but abstain from the flesh of cows, no less than the Egyptians, and will not keep swine. Nay, among the women of Cyrene, to strike a cow is accounted a crime, because they celebrate the feasts and festivals of the Egyptian Isis. Neither will the Barcæan women taste the flesh either of a hog or of a cow."

It is not within our province to trace the connexion of the mythological systems of Egypt, Greece, and India; it is, however, certain that the practice and worship of the ancient nations of India are in many points the same as those of the Egyptians. The religious writings of India say that the cow was the first animal created by the three gods who were directed by the supreme Lord to furnish the earth with animated beings.

In the sculptures in the cave temples of Ellora, the

sacred bull is represented with great truth and spirit, surrounded by a troop of grotesque characters, which, as Captain Grindlay states, "appear to be the gnomes or sprites of Hindu poetical machinery, and are never-failing accompaniments in all the ancient cave sculptures." Colonel Tod (see Trans. Royal Asiat. Soc., vol. ii. p. 560) says, "In Hindu mythology the bull *Nanda* is at once the guardian of one of the two gates of Heaven of *Iswara*, or *Bal-Siva*, and his steed. The astronomic allusion thus blended with mythology is evident, *i. e.*, the entrance of the sun into the sign *Taurus*, the equinoctial festival of remote antiquity, and regarded as a jubilee by the Indo-Scythic nations hemming the shores of the Mediterranean to the Indian Ocean."

The worship paid in ancient times to the ox by the Hindus and Egyptians, as well as by other nations, appears to have been deeply rooted into their systems of theblogy: and not only so, but it infected other nations in contact with them, and seems to have infused a desire of its adoption into the minds of people whose religion was otherwise of a different character. In all ages where sacrificial offerings have entered into the economy of the religious observances of the people, the ox was led as a victim to the altar, together with the sheep and the goat. We have already referred to the ancient Hindu sacrifices, and we might notice those of the Greeks and Romans, to which the classic writers make so many allusions, as well as those described in the Scriptures both before and after the Mosaic dispensation, did we not feel convinced that to dwell on these points would be neither interesting nor profitable. The day is past in which hecatombs of oxen swelled the pomp of religious ceremonies, and the Hindu, instead of offering the bull on the altars of *Ba-Iswara* regards it as sacred to *Brama*, and refuses to shed its blood.

This veneration, however, for the "sacred bull" in India, does not prevent the use of the ox for the purpose both of draught and burden, and sometimes, also, for the saddle, and it is said to travel with considerable celerity.

Domesticated, as we have already stated the ox to have been from the earliest epoch, it will not be deemed surprising that it has ramified into certain well-marked and permanent varieties, each variety having its own range of habitation. But, beyond those minor differences observable in the cattle of Europe, or any other quarter of the globe, dividing them into breeds, and more important in the eye of the farmer than of the naturalist, there are differences of a far more tangible nature, to which we have previously alluded, which strike the eye of every observer, and which at once excite strong doubts as to the origin of these races from one common source. Compare, for example, the Indian races with the breeds of Europe, and the points of distinction are at once obvious. Narrow high withers, surmounted by a large fatty hump, an arched back rising at the haunches, and suddenly falling to the root of the tail, slender limbs, a large pendulous dewlap falling in folds, long pendant ears, and a peculiarly mild expression of the eye, proclaim the zebu race of India,—a race varying in size from that of our largest cattle to that of a young calf. The zebu race is not exclusively confined to India, China, and the Indian islands; but it is found in Madagascar also, and on the eastern coast of Africa, where, as in India, it is used for the ordinary purposes of draught and burden. India, however, is doubtless its parent country; and we may readily believe that, in remote ages, when an extensive commerce existed between this country and Egypt, it was introduced into the land of the Pharaohs. In Upper Egypt

and Abyssinia it is almost exclusively prevalent. We learn from Burckhardt that in lower Egypt the humped race is unknown, but that it begins in Dongola, whence, all along the Nile, as far as Sennaar, no others are seen. It is this humped race, also, which is represented in the battle-pieces on the walls of several ancient temples in Upper Egypt.

Some naturalists, indeed, do not hesitate to regard the humped races as specifically distinct from the common races of the western portion of the old world, and such appears to be the opinion of Mr. Swainson. Speaking of the *urus* and the *domestic* or, he says, "Both these have no protuberance upon their shoulders. This character we find in the third type, which seems to have its greatest development in Asia. Major Smith alludes to a large species of Asia, equal to a bull of the largest stature, having a hump upon the back which sometimes weighs fifty pounds, the horns are short and bent backwards and the colour is usually red or brown. Nor is this *very peculiar specific distinction* (for *such* must we consider it) confined to a single breed or race, for various modifications or varieties occur in different parts of Asia, and even along the shores of Northern Africa." The same writer regards the small hornless zebu, with a small hump as another species,—observing that the name of *Bos pusio* may be correctly applied to *this species*; while a fifth *type* or species is found in Abyssinia. "It is reared in Abyssinia and in the north of central Africa; it is of a large size, generally white, and armed with immense horns. Some travellers agree in stating that they are humped, while in other accounts they are considered as *buffaloes*, nor does it appear proved that the hump is a simple fatty excrescence; there is even some probability that the ridge of the withers is

the principal cause of the elevation."—"Of this latter, which we consider as the fifth type of the genus *Bos*, Major Smith enumerates two races; the Galla or Zanga race, generally white, with a small hunch, black muzzle, small bone, and high legs, is the largest known. The horns turn up vertically, are of a pale horn-colour, extremely bulky, and near four feet in length; in other words, nearly as long as the entire length of the *Bos pusio*. The second or Bornou race is likewise white, of a very large size, hunched back, and immense horns; but instead of rising vertically, they are couched outwards and downwards, like those of the African buffalo, with the tips forming a half-spiral revolution. We are indebted to Captain Clapperton for a knowledge of this species, but its most surprising peculiarity remains to be described.

"The corneous external coat (of the horns) is very soft, distinctly fibrous, and at the base not much thicker than a human nail; the osseous core full of vascular grooves and very cellular inside; the pair together scarcely weighing four pounds. The skin passes insensibly into the horny state so that there is no exact demarcation where the one commences and the other ends. The dimensions of one of these horns were as follow:—Length measured on the curve, three feet seven inches; circumference at the base, two feet; the same midway, one foot; length in a straight line from base to top, one foot five inches and a half. The species has a small neck, and is the common domestic breed of Bornou, where the buffalo is said to have small horns."

Whether these Abyssinian, Galla, and Bornou races of cattle are specifically distinct from the Indian zebú is a question we shall not pretend to settle; but, as far as the latter is concerned, we are ourselves strongly inclined to the belief of its originating from

a type specifically distinct from that whence our common ox has sprung,—a type perhaps to be sought in vain. It is a remarkable fact in corroboration of this view of the subject that the zebu cattle of India and China were precisely the same at least 2000 years before the Christian era as they are at present; they have absolutely undergone no alteration in the peculiar characters by which they are so readily to be distinguished. This is proved at once by the faithful and spirited delineations of the zebu bull in the most ancient sculptures of India: we may particularise those of the celebrated cave temples of Ellora and the carvings of the “Seven Pagodas” (as they are commonly called) at Mahámalaipur, on the Coromandel coast; to say nothing of many other relics of antiquity, in which the animal is perpetually represented, so as not to be mistaken.* It is true that Cuvier and other naturalists have adopted an opinion contrary to that now advocated; but they have all overlooked the important fact that the zebu race has been from the remotest antiquity—an antiquity out of the pale of records—precisely what it is in the present day; a proof of the permanency of its distinguishing characteristics—characteristics which, amidst all the minor variations incidental to a state of domestication, are presented with undeviating constancy.

That man should endeavour to domesticate as many species as possible of a group of animals so intimately connected with his welfare as that of the genus *Bos*, or that in his colonization of the globe he should avail himself of the species which he found indigenous in the territory around his abode, will not be a matter of surprise, while his

* On the other hand, the ancient sculptures of Greece and Rome present us with the ox of antiquity in Europe, such as we see it in the present day in the south-east of Europe.

success might be expected (with reference to its numerical extent) to bear something like a ratio to that of the number of species demanding his attention. For example, in Europe the ancient *urus* and the aurochs (or bison of the Roman writers) were the only species inhabiting the forests and wilds of a then thinly-peopled region. Of these one species (granting that the ox is, as Cuvier imagines, the descendant of the extinct *urus*) was rendered subservient to man; while in Asia, where several species exist, the zebu, the gayal, the yak, and the buffalo have been domesticated. Of these, two have been introduced to other regions of the globe, and their wild origin (certainly that of the zebu) is lost. The gayal and the yak still exist in a wild condition among the mountain-ranges of northern India, where alone their domestic relatives are in use. It is remarkable that, in speaking of the gayal (*Bos frontalis*, Lanfbert), Cuvier should have thus expressed himself:—"C'est une race domestique dans les contrées montagneuses du nord-est de l'Inde, et qui provient peut-être du mélange du buffle avec l'espèce commune."—(*Règne Animal*, vol. i. p. 180.) Of the gayal being the offspring of the buffalo and the common ox, or of the zebu, there is not the slightest proof; nor know we on what ground Cuvier founded his conjecture. To revert from this digression; we may observe that, of the four species of domestic cattle in Asia, not one is identical with the common European ox, that is, if our views respecting the common Indian or zebu race, as being specifically distinct, are correct.

With respect to the ox represented on the Greek and Roman sculptures, it must be confessed that, in many points, and more particularly in the pendulous folded dewlap, it resembles the zebu, and may probably have been the ultimate product of a mixture

of the zebu race, introduced at an early epoch from India, with a race indigenous in Greece and Italy. This, however, is a mere suggestion. "To the classical antiquary," says a writer, "we beg to suggest that the dewlap of the Brahmin bull offers an object of much attention and interest, by reason of its sharp and decided outline, and perpendicular creases or folds, wonderfully verifying the correctness of those Greek sculptures in bronze and marble, in medals and statuary, in which we see representations of Victory sacrificing a bull, of the oxen of Ceres, &c. These representations will no longer be considered, by those who may have opportunity to examine the sacred bull of India, out of drawing, or exaggerated in their fore-quarters, although critics of the last century (less fortunate in this respect than the visitors of the Zoological Society's gardens) have determined them without hesitation to be altogether incorrect."

In the Greek sculptures the ox is represented without any hump; but the withers are high, and the crupper rounded. Of the origin of this race, however, the classics, as far as we are aware, give us no definite intimation.

Several beautiful specimens of the zebu breed, both of the full-sized variety and also of the dwarf caste, exist in the gardens of the Zoological Society: they are remarkable for their docility and quiet temper, but have not been employed in any sort of labour. Mr. Youatt informs us that a beautiful bull and cow of the Nagore breed were exhibited at the Christmas cattle-show in 1832, and adds, that "They were bred by Lieut.-Colonel Skinner, at his farm at Danah, near Pokah, on the borders of the Bichaneer desert, a hundred miles to the westward of Delhi. They are not *buffaloes*, but of the highest breed of Indian cattle. They are used in India by the higher

orders to draw their state-carriages, and are much valued for their size, speed, and endurance, and sell at very high prices. These specimens arrived at Calcutta, a distance of fourteen hundred miles, in January, 1829, and were then something under six months old. They were sent as a present to Mr. Wood, who was then residing at Calcutta, and by whom they were forwarded to Mr. Perkins. Colonel Skinner has a large stock of them, and six or seven beasts are always kept saddled, to carry the military dispatches. They remain saddled three or four hours, and, if not wanted in that time, fresh ones are brought out to relieve their companions. They will travel with a soldier on their back fifteen or sixteen hours in the day, at the rate of six miles an hour. Their action is particularly fine, nothing like the English cattle, with the sideway circular action of their hind legs: the Nagore cattle bring their hind legs under them in as straight a line as the horse. They are very active, and can clear a five-barred gate with the greatest ease. Mr. Perkins has a calf which has leaped over an iron fence higher than any five-barred gate, and the bull frequently jumps over the same fence in order to get at the water, and when he has drunk his fill leaps back again."

"Mr. Perkins very properly observes that the chief advantage of these Brahmin bulls would probably consist in their speed and strength, in both of which they surpass any of our breeds."

Of the extensive use and consequent value of the Brahmin, or large zebu breed in their native climate, we can scarcely form an adequate idea. In some parts of India the dwarf races are unknown, and this is bred exclusively. According to an observation of Colonel Sykes, in the Proceedings Zool. Soc., the Brinjarees, a singular erratic people, possess vast herds, and breed the Brahmin cattle on an extensive

scale; "and an army rarely moves in the field without 15,000 or 20,000 bullocks to carry its grain. Dwarf cattle are not met in Dukhun." The buffalo, however, divides the palm of usefulness with the zebu in the agricultural labours of India, and is preferred for many purposes, on account of his more robust constitution. In the mawals, or hilly tracts among the Ghauts, this animal supersedes the zebu. "In those tracts," says Colonel Sykes, "much rice is planted, and the male buffalo, from his superior hardihood, is much better suited to resist the effects of the heavy rains and the splashy cultivation of rice than the bullock. The female is also infinitely more valuable than the cow, from the very much greater quantity of milk she yields." In point of beauty and docility there is no comparison between the heavy savage buffalo and the "sacred bull of Bramah." Nor is the former ever devoted to Bal-Siva, as a meritorious offering. On the contrary, it is common to meet with Brahmin bulls thus devoted, which wander at their pleasure, exempt from the servitude of the yoke, and which are regarded as endowed with a sacred character. The beautiful form and sleek appearance of these fortunate creatures particularly engaged the notice of Bishop Heber. The first which the Bishop met in his journey was grazing in a green paddy-field, and was branded on the haunches with the emblem of Siva. He crossed their path, tame and fearless, and, seeing some grass in one of the Europeans' hand, coolly walked up and smelt it. These privileged bulls are turned out when calves, on certain solemn occasions, by wealthy Hindoos, as acceptable offerings to the divinity Siva. To strike, or any way injure or molest one of them is held as a mortal sin. "They feed," he observes, "where they choose, and devout persons take great delight in pampering them. They are exceeding



Brahmin Bull.

pests in the villages near Calcutta, breaking into gardens, thrusting their noses into the stalls of fruiterers' and pastrycooks' shops, and helping themselves without ceremony. Like other petted animals, they are sometimes mischievous, and are said to resent with a push of their horns any delay in gratifying their wishes." *

Between this absurd reverence for consecrated bulls, and the ordinary treatment of the working ox, there is a vast distinction; the latter is harshly and often severely treated. The cow, however, has more forbearance exercised towards her than from the treatment of the ox might be expected. Bishop Heber, speaking of the mode of treading out the corn still practised in India, relates the following:—"One of the Hindoo farmers was threshing out a small kind of millet, by driving oxen over it, round and round, in a circle. They were just leaving off work as I came up, and a hind was bringing a large bundle of green Indian corn, weeded from the thick crop, for their provender. I observed, however, that the animals, during their previous employment, were not muzzled, according to the scriptural rule, at the same time that they were kept so constantly moving that a few mouthfuls were all they could get. While I was examining this heap of grain, and asking the old man some questions, his cows came for the evening, and I pleased him exceedingly, when the cowman ran forward to beat them from my path, by forbidding him to strike them. 'Good! good!' he said, with an air of much satisfaction, 'one must not beat cows.' It seems to me that the tender mercies of the Hindoos towards animals are exhausted on cows (and Brahmin bulls) only; for oxen they have no pity—they are treated with much severity." † "That the ox should be severely treated or employed in

* Journey, vol. i. p. 145. † Ibid. vol. i. p. 311.

hard work by the Brahmins seems a sort of contradiction to the principles by which the Brahmin or Hindoo professes to be guided; but contradictions of this sort are too common to be surprising.

Thevenot (see his 'Relation,' vol. iii. p. 151) thus describes the practice of India with respect to the use of the ox both for the saddle and for drawing wheeled carriages:—"As the oxen in India are by no means ungovernable, there are many persons who employ them in travelling, and who mount them as they do horses. Their ordinary gait is easy: instead of a bit, a small cord is passed double through the gristle of the nose, and to this is attached a stout cord, in the fashion of a bridle, which is kept up by the hump which the animal has on the fore-part of the back, and which is wanting in our oxen. The animal is saddled like a horse, and, when a little excited into action, it goes very quickly; some, indeed, gallop as well as a good horse. These cattle are in general use throughout the whole of India; and they use no other in ploughs, coaches,



and chariots, which are drawn by oxen, their number being in proportion to the weight of the load. They are harnessed by means of a long yoke at the end of the pole, which is placed on the neck of the two oxen, and the driver holds in his hand the cord to which is attached the small double cord passed through the nostrils."

It would appear that *white* oxen are highly esteemed in India, as they have also been in other parts of the world. Olearius (tome i. p. 458) notices the procession of an Indian prince, who was drawn in a carriage by two white oxen, which had the neck short, and a hump between the shoulders, but which were as lively and active as horses. Bishop Heber observes that the Thakoors, the nobility of the Rajpoots, generally travel in covered waggons drawn by white oxen, whose horns they gild. Tavernier observes, "The two oxen which were harnessed to my carriage cost me nearly six hundred rupees. The reader need not be astonished at this price; for these are oxen of great strength, and which travel journeys of twelve to fifteen leagues a day for sixty days, and always on the trot. When they have done half their day's work they have two or three balls (the size of a penny loaf) of wheaten flour kneaded with butter and coarse sugar; and in the evening their ordinary fare consists of chick-peas bruised and steeped half an hour in water."

Of the docility, activity, and services of the zebu ox in India, much more need not be said. Numerous travellers, both in the past and present century, give the same testimony, and record observations bearing upon the same point. Hence, to a certain extent, it may be inferred that the ox is more valuable in India than in most parts, or perhaps any part, of Europe, where it is never used for the saddle, nor for drawing carriages of state, but employed merely

in the drudgery of the farm, at the plough, and in the cart.

Receding westward from India into Persia, we gradually lose the zebu race, or at least find it blended with that of another type. (Chardin vol. ii. p. 28) observes,—“The oxen of Persia are like ours, excepting towards the frontiers of India, where they have the hump on the back. Throughout the whole country the ox is seldom eaten as food: it is only reared as a beast of burden, or for tillage. Such as are used for burdens are shod with iron, in consequence of the stony mountains over which they have to travel.” The shoeing of oxen where the country is rugged, and the roads hard or stony, is also practised in India, as Thevenot relates, but such is not a general custom. The shoes are light, and two are placed on each foot, as the cloven character of the hoof necessarily requires; so that the natural freedom of each part is not impeded.

Buffon observes that the ox without a dorsal hump (which he terms the aurochs-race) occupies the cold and temperate zones, and is thinly distributed towards the regions of the south; on the contrary, the ox with the hump (which he terms the bison race) exclusively occupies all the southern regions; namely, the entire continent of the Indian empire, the islands of the eastern and southern seas, and the whole of Africa from Mount Atlas to the Cape of Good Hope, including Madagascar and the island of St. Juan in the channel of Mosambique. With respect to the Cape of Good Hope, it is certain that the zebu race does not obtain there, at least in the present day; but F. Leguat (see his *Voyages, &c.*, 1720) observes that “the oxen are of three sorts at the Cape of Good Hope, all of large size and very active; some have a hump on the back, others have the horns long and pendant, while others have them

turned up and well shaped, as in English cattle. In Madagascar, however, and along the eastern coast of Africa, including Abyssinia, and the interior regions adjacent, and on various parts of the western coast, the zebu races are extensively distributed." M. Adanson (in his '*Voyage au Senegal*') observes that the Moors possess numerous herds on the banks of the Niger. . . "The oxen were for the most part larger and higher on the limbs than those of Europe, and remarkable for a hump of flesh elevated a foot or more on the withers between the two shoulders; it is excellent to eat." An old writer (J. H. Grosse, 1758) records the same observation with respect to oxen of the isle of St. Juan, which he says have a fleshy excrescence between the shoulders, which is superior to tongue; and of as delicate a flavour as marrow.

Thus much respecting the distinction between the zebu race of cattle and the ordinary breeds of Europe and their apparently natural distribution. Whichever breed or race we contemplate, we shall find it adapted to the service and necessities of man, its value being in proportion. It will readily be admitted, however, that the interest which attaches to the ox does not arise from its intelligence, but from its absolute utility: the pleasure which the mind experiences when we gaze on peaceful herds, feeding in tranquil security, is of a complex origin, the result of an association of ideas more or less remotely connected with the presence of these creatures, which, time immemorial, have formed the wealth of man, and which have therefore engaged alike the attention of the statesman, the poet, and the philosopher.

Perhaps, however, the intelligence of the ox, like that of the ass, has been underrated. Certain it is that he is susceptible of education, and that, where the work of culture is most exercised, there his disposition and intelligence assume a higher grade.

“It fares with the ox,” says Mr. Youatt, “as with all our other domesticated dependents, that, when he has lost the wild freedom of the forest, and become the slave of man, without acquiring the privilege of being his friend, or receiving instruction from him, instinct languishes without being replaced by the semblance of reason. But when we press him into our immediate service,—when he draws our cart and ploughs our land,—he rapidly improves upon us; he is, in fact, altogether a different animal: when he receives a kind of culture at our hands, he seems to be enlightened with a ray of human reason, and warmed with a degree of human affection. The Lancashire and the Devonshire ox seem not to belong to the same genus. The one has just wit enough to find his way to and from his pasture; the other rivals the horse in activity and docility, and often fairly beats him out of the field. He is as easily broken in, and he equals him in attachment and gratitude to his feeder.”

The oxen of Terceira (one of the Azores) are said to be remarkable for docility and intelligence. “They are the largest and finest of all Europe; they have horns of prodigious size; they are so gentle and familiar that when, among a thousand collected together, the owner shall call one by its name (for they have each, like our dogs, their own name), the ox will not fail to come to him.” (See ‘*Voyage de la Campagne des Indes de Hollande*,’ vol. i. p. 490.)

What the horse is to the Arab—his companion and assistant,—that was the ox to the Hottentot, before the Hottentot was deprived of his native independence, and whilst he could call his country his own. Under his culture the ox displayed a degree of intelligence superior to that of any animal, the dog excepted, and scarcely to be surpassed by him.

The sharer of his master's toils and wars,—his companion at all times,—and his assistant in the fields, as the guardian and defender of the flock,—the ox seemed to lose its ordinary character and rise into a higher sphere of being. "The Hottentots," says Kolben (vol. i. p. 160), "have oxen which they use with success in battle: they call them *backeleys*, the word *backeley* in their language signifying war. Every army is always provided with a large troop of these oxen, which permit themselves to be governed without trouble, and which their leader lets loose at the appointed moment. The instant they are set free they throw themselves with impetuosity on the opposing army; they strike with their horns, they kick with their heels, they overthrow, they rip up and trample beneath their feet, with frightful ferocity, all that opposes; so that, if they be not promptly driven back, they plunge with fury into the midst of the ranks, throw them into disorder and confusion, and thus prepare for their masters an easy victory. The manner in which these animals are trained and disciplined undoubtedly does great honour to the talent of these people." In another place the same writer says, "These *backeleys* are moreover of great use to their owners, as guardians of their flocks: when out in the pasture-lands, at the least sign of their conductors they will hasten to bring back the cattle which are straying at a distance, and keep them herded together;—they rush on strangers with fury, whence they are of great service against the Boschmen, or robbers, who may attempt to plunder the flock: each kraal has at least half a dozen of these *backeleys*, which are chosen from among the most spirited oxen: on the death of one, or when one in consequence of old age becomes un-serviceable (in which case its owner kills it), another ox is selected from the herd to succeed it. The

choice is referred to one of the old men of the kraal who is thought to be the most capable of discerning that which will most easily receive instruction. They associate this novice ox with one of long experience, and they teach him to follow this companion, either by beating or some other method. During the night they are tied together by the horns; and they are also thus kept tied during the greater part of the day, until the learner has become a good guardian of the flock: these *guardians* know all the inhabitants of the kraal, men, women, and children, and testify towards them the same respect that a dog displays to all those who live in the house of his master. There is therefore no inhabitant of the kraal who may not with all safety approach the flocks; the *backeleys* never do the least injury; but, if a stranger, and particularly a European, should offer to take the same liberty without being accompanied by some Hottentot, he would be in great danger: these guardians of the flock, which usually feed around it, would come upon him full gallop: then, unless he be within hearing of the shepherds, or have fire-arms or good legs, or unless a tree be near in which to climb, he is sure to be killed; it would be useless for him to have recourse to sticks or stones—a *backeley* has no fear for such feeble weapons.

Le Vaillant, in vol. ii. of 'New Travels in the Interior of Africa,' states that in the country of the less Nimiquas, "The oxen equally exceed in strength those in the eastern colonies, but from the modes of bringing them up they are divided into three classes,—beasts of burden or draught, saddle oxen, and war oxen. Of the former two I shall say nothing, as they are known among the other savage tribes, and even in the colony, as I have already said, where they are broken in after the same manner, observing only that

the Nimiqua saddle-oxen are much superior to the horse in supporting fatigue, and excelled by him in scarcely anything but swiftness. The oxen selected for this purpose are those which have the least bodies and largest legs.

"As to the war oxen (*bakely-osse*), it was in this horde I saw them for the first time, which proves how much Kolben was mistaken when he asserts that they are used in *all* the Hottentot nations. Their name is derived from the purpose for which they are employed. They are used in battle, and those in particular are chosen which are most fierce and ungovernable. Being driven on against the enemy, they become furious at the sight of the adverse host, rush on the men, trample them under their feet, gore them with their horns, and pursue them in their flight till they have deprived them of life.

"They are also employed in defence of flocks and herds. Naturally courageous, they are not only capable of repelling wild beasts, but they even venture to attack them; and a hyæna, however hungry, will never come near a flock guarded by two or three of these formidable animals, a number of which will even make head against a lion."

Burchell, in his Travels in South Africa, well observes that, with the Hottentots, "the tending and managing their cattle is the grand employment of life." In illustration of this, he relates (see Journey from Cape Town to Tulbagh) the following:—

"Standing attentive to all that was going on, and noticing the manner in which my men yoked the oxen to the waggon, I was surprised to find they all were so well acquainted with the name of every individual ox and knew the place in the team where each had been trained to draw. When Magers and his companion were sent into the Bokkeveld to fetch

home the oxen, the farmer of whom they were bought merely repeated their names and places in the team. These he correctly retained in his memory, and afterwards again repeated to Jan, Kok, Philip, and Spaelman, who now called each ox by his name with the utmost readiness. This faculty, common to Hottentots and to all the African tribes that I visited, shows the high degree of perfection to which any particular use of the mind may be brought by constant exercise, for with these people tending and managing their cattle is the grand employment of life."

The same traveller thus speaks of the saddle-oxen of that country (vol. i.) :—"These oxen are generally broken in for riding when they are not more than a year old. The first ceremony is that of piercing the nose, to receive the bridle; for which purpose they are thrown on their back, and a slit is made through the *septum* or cartilage between the nostrils, large enough to admit a finger. In this hole is thrust a strong stick stripped of its bark, and having at one end a forked branch to prevent it passing through. To each end of it is fastened a thong of hide, of a length sufficient to reach round the neck, and form the reins; and a sheep-skin, with the wool on, placed across the back, together with another folded up, and bound on with a rein long enough to pass several times round the body, constitutes the saddle. To this is sometimes added a pair of stirrups, consisting only of a thong, with a loop at each end, slung across the saddle. Frequently the loops are distended by a piece of wood, to form an easier rest for the foot. While the animal's nose is still sore, it is mounted and put in training, and in a week or two is generally rendered sufficiently obedient to its rider. The facility and adroitness with which the Hottentots manage the ox has often excited my admiration. It

is made to walk, trot, or gallop, at the will of its master, and, being longer legged, and rather more lightly made than the ox in England, travels with greater ease and expedition, walking three or four miles in an hour, trotting five, and galloping on an emergency seven or eight."

In other parts of Central Africa the ox is employed in like manner. Major Denham thus gives an account of its use in the central countries which he visited:—"The beasts of burden," he observes, "are the bullock and the ass. A very fine breed of the latter are found in the Mandara valleys. Strangers and chiefs in the service of the sheikh, or sultan, alone possess camels. The bullock is the bearer of all the grain and other articles to and from the markets. A small saddle of plaited rushes is laid on him; when sacks made of goat-skins, and filled with corn, are lashed on his broad and able back. A leather thong is passed through the cartilage of his nose, and serves as a bridle; while on the top of the load is mounted the owner, his wife, or his slave. Sometimes the daughter or wife of a rich shouaa will be mounted on her particular bullock, and precede the loaded animals, extravagantly adorned with amber, silver rings, coral, and all sorts of finery; her hair streaming with fat; a black rim of *kohal*, at least an inch wide, round each of her eyes; and, I may say, arrayed for conquest at the crowded market. Carpet or robes are then spread on her clumsy palfrey; she sits *jambe de ça, jambe de là*, and with considerable grace guides her animal by the nose. Notwithstanding the peaceableness of his nature, her vanity still enables her to torture him into something like caperings and curvetings."

In South Africa, however, the greatest utility of the ox, at least as far as the interests of the colonial settlers are concerned, consists principally in its

endurance and powers of draught. The usual mode of travelling in this country is in covered waggons drawn by oxen, which are more serviceable animals, taking all circumstances into account, than horses would be in their place. The following passage from a periodical work of the day presents us with a good picture of a party of emigrants to South Africa, thus journeying to their destination:—"We struck our tents at Algoa Bay on the 13th of June, which is about the middle of winter in the southern hemisphere. The weather was serene and pleasant, though chill at night, somewhat like fine September weather in England. Our travelling train consisted of seven waggons hired from Dutch-African colonists, and driven by the owners, or their native servants, slaves and Hottentots. These vehicles appeared to be admirably adapted for the country, which is rugged and mountainous, and generally destitute of any other roads than the rude tracks originally struck across the wilderness by the first European adventurers. Each waggon was provided with a raised canvas tilt, to protect the traveller from sun and rain, and was drawn by a team of ten or twelve oxen, fastened with wooden yokes to a strong central trace, or *trek-tow* formed of twisted thongs of bullocks or buffalo hide. The driver sat in front to guide and stimulate the oxen, armed with a whip of enormous length while a Hottentot or Bushman boy, running before, led the team by a thong attached to the horns of the foremost pair of bullocks. Where the road was bad and crooked, or when we travelled at a rapid rate, as we frequently did on more favourable ground, these leaders had a very toilsome task; and, if they made any mistake, or in aught displeased the lordly *baav* (gruff boor who sat behind), his formidable lash was not unfrequently applied to their naked limbs."

Formerly, indeed, if the account given by Barrow is to be credited, the treatment exercised by the Dutch-African boors to their oxen was brutal in the extreme. The Dutch boors, moreover, made use of very large and clumsy waggons, and delighted in transporting tremendous loads at a time. It was a common sight to see six, eight, ten, or even a dozen pair of oxen yoked to an enormous vehicle. But even this number was inadequate to such burdens as they had to draw, and the resistance of such roads. The most disgraceful cruelties were used to force these poor creatures on their way. Their drivers cut them with knives, and when worn out, they laid themselves down, and refused to rise, was a common practice to light fires under their sides, and so force them to go.

One of these brutal boors, whose knife had been often employed on the flesh of his cattle, boasted that he could start his team at full gallop by merely whetting that knife on the side of his waggon. Once, as he was exhibiting this experiment, the waggon was overturned, and one of the company, "unfortunately not the proprietor," says Mr. Barrow, "had his leg broken."

The same traveller saw the boors cut the noses and the tongues of their oxen, and practise other barbarities too revolting to be repeated.

Happily a pleasanter picture is presented by a more recent traveller, who says,—“The waggons in use at the Cape are still very heavy. The oxen draw by a wooden yoke, consisting of a strong bar laid across their necks, to which are fixed in right angles downwards four short pieces, so as to admit the neck of each animal between two of them. These are kept in their places by being tied together below the neck with a small thong. A strongly plaited leather thong runs from the ring at the end of the

pole to the yoke of the first pair of oxen, being fastened, in passing, to the middle rings of each yoke. The bullocks, by pushing, seem to draw with ease. The Hottentot driver has a whip, the stick of which is a strong bamboo, twelve and more feet long, and the lash a plaited thong of equal or greater length. With this, to European grasp, unwieldy instrument, he not only cracks very loud, but hits any one of the bullocks with the greatest surety. But the chief engine of his government is his tongue, and he continually calls to his cattle by their names, directing them to the right or left by the addition of the exclamations of 'hott' and 'haar,' occasionally enforcing obedience to his commands by a lash, or by whisking or cracking his whip over their heads. A boy leads the foremost oxen by a thong fastened about their horns, and they seem to follow him willingly."*

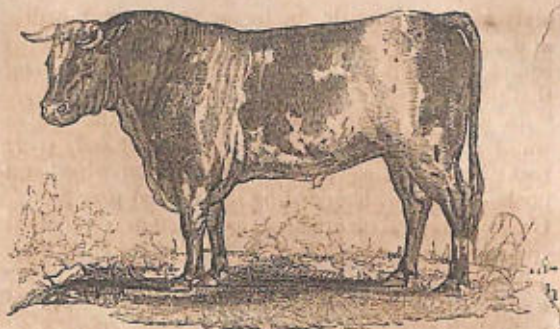
It is only within a few years that the use of the pack-horse has been discontinued in England. In Africa the pack-ox takes its place, and performs the same duties. Burchell (vol. ii. p. 70) thus notices the activity and vigour of the South African pack-ox:—"We proceeded nearly the whole way at a brisk step, sometimes trotting and at other times galloping, while the three bushmen who drove the pack-oxen on before us hurried them over the rocky ground at so extraordinary a rate, that even on horseback I found it not easy to keep up with them, and often, when the surface was so thickly covered with stones, and large fragments of rock, that my horse could scarcely find where to place his foot, I was obliged to call out to them to slacken their pace."

Percival in his 'Account of the Cape of Good

* Latrobe.—Journal of a Visit to South Africa.

Hope, thus speaks of the cattle of that region:—
 “The cows and oxen also are of various kinds. The large draft oxen are peculiar to the Cape and this part of Africa. They are distinguished by a large head, long horns and legs, and very broad hoofs: they are lank before, and broad behind. A race of beautiful small oxen, like those of Alderney, are fattened for table, and the cows of this breed afford a great quantity of milk. The beef, however, of the Cape is in general coarse and indifferent; for the Dutch scarcely ever keep up cattle, as we do, in particular meadows and places where they meet with sweet and nourishing grass. The butchers generally buy from the farmers in the country, and kill the beasts immediately after coming off a long journey, tired, jaded, and their fat all spent; consequently, their flesh is dry and tough, and its flavour is, besides, much depraved by the sour, acrid grass and shrubs they are accustomed to feed upon.”

It is time, however, that we direct our attention more immediately to the ox in Europe, not, indeed, with a view to the various breeds, into which it has ramified, but rather for the purpose of tracing the modifications of instinct and the diversities of habit which it displays, in contrast to those of the oxen of India and Africa,—modifications depending upon the civil and political conditions of the people, and the character and products of the earth's surface—all of which have their respective influence. In England, a country abounding in luxuriant pasturage, the ox, only used in certain districts for the purposes of agricultural labour, attains to a large size, and its breeding and rearing are carefully attended to, according to the views of the *grazier* on the one part, and of the *dairy-farmer* on the other. With the *grazier*, roundness of form, a moderate smallness of bone, depth of chest, and aptitude to acquire external fat upon a



Common English Bull.

small consumption of food, are among the points of excellence aimed at and expected. The attainment of perfection, however, in those points most desirable in the eyes of the grazier, is generally accompanied with a corresponding deterioration of cattle, as affecting the interests of the *dairy-farmer*, for very seldom are combined an aptitude to fatten and the quality (in the cow) of yielding abundance of milk. Both parties, therefore, attend to their peculiar interests, only agreeing in the care and attention bestowed upon the animals thus closely connected with their interests. Hence it results that in England we are accustomed to see the ox sleek, gentle, well fed, and displaying (for seldom is it called into exercise) but a limited degree of intelligence. It has no scope for the exercise of instinct, or those higher powers which seem to partake less of instinct than of reason. In the northern parts of our island, indeed, and in some parts of Ireland, it leads a more independent but less luxurious existence, and the herds are as wild, almost, as if they belonged not to a reclaimed race. In the Shetland Isles, which consist of one chief island, near

sixty miles in length, by ten or twelve in breadth, and a numerous group of diminutive ones scattered round, the cattle are left to their own resources,—and that, in a rugged, bleak, and barren wilderness, where “no tree or shrub appears to relieve the eye in wandering over these dreary scenes, and only gray rocks appear rising from the midst of marshes, and pools and shores bounded by the wildest precipices.” Grasses, natural or artificial, green crops, or verdant enclosures, are sought for in vain; there is nothing but moss, and heath, and sea-weed. Yet here exists a small but hardy and spirited breed of horses, and a stunted race of cattle, covered with long rough hair, which forms a needful protection against the storms of sleet and snow which pour upon their sea-girt abode. The same observation applies to the Orkneys. “Here,” says Barry (see History of the Orkney Islands), “the ox, which is common here, is of a singular breed, altogether distinct from what is seen in the counties nearest us in the south; and, probably like several other of our domestic animals, came originally from the Scandinavian shores. But from whatever country or whatever stock they sprung, the cattle of this place at present are of a diminutive size, owing principally to their being reared in too great number, and of consequence half starved in their youth. Their colour is black, brown, white, and in many instances party-coloured, mottled, or brindled, and their shape inelegant—as their heads are low, their backs high, their buttocks thin, their bones prominent, and, instead of having wide-spreading horns, they have only small ones, that are short and contracted, with their tops bending towards the forehead.

“Notwithstanding these disadvantages in point of shape and appearance, the oxen are strong, hardy, and make excellent workers, provided they be early

well trained to the yoke, and so plentifully fed as to enable them to support their labour. Even on a very moderate quantity of provender, they will perform a surprising quantity of work in the cart or in the plough, and not for a few seasons only, but for the space of no less than six or seven years. To their capacity for work they add another excellence, in not being subject to disease; and they are, at the same time, such rapid feeders, that, if put up in the stall, or on good pasture, but for a few months, their beef becomes excellent.

“The cows are small and lean, being kept in too great numbers, though they can support themselves pretty well in fields where the grass is by no means abundant. A very moderate degree of food also soon renders them fat. They produce a calf for the most part annually, and give a quantity of excellent milk which, considering their size, their habit of body, and their pasture, is really astonishing. An ox, of an ordinary bulk, and of the common country breed, weighs about sixty pounds the quarter, while a cow of the same description does not exceed forty-five pounds, and both of them have increased so much in value of late (1800) as now to cost treble the price for which they would have sold fifteen years ago. This increased value has not arisen from any improvement in the breed, in consequence of an intermixture with that of other places, for that has only taken place in a few instances, but from a much greater demand for the labour of oxen and the butter of cows, and for the beef of both, to answer an augmented consumption here, and to supply the markets in other countries. As an instance to what extent the demand from these markets sometimes reaches, no longer ago than last year nearly two thousand live cattle were sold to dealers from the south, who carried them across the Pentland Frith,

and drove them for feeding into the different districts of the kingdom. Such a vast deduction in one season from the breed of a small district might be supposed to have nearly exhausted the stock; but this is by no means the case, as there was a sufficient number left for every useful purpose. And this will excite no surprise when it is considered that our ordinary stock of black cattle is calculated to amount to upwards of fifty thousand."

In Iceland the breed of cattle closely resembles that existing in the Shetland and Orkney Islands; but, though Iceland is higher north than the Shetland Isles, it affords better pasturage, and hence the cattle there are superior in point of size. To the natives of that singular and, in many respects interesting, region, their cattle are of the utmost importance; and, though the management of the stock is ill-conducted, or rather conducted on no principles, the breed is not destitute of pretensions to a tolerable form and contour. Doubtless it might be highly improved. Mackenzie, in his account of Iceland, reports that "The cattle, in point of size and appearance, are very like the largest of our highland sorts, except in one respect, that those of Iceland are seldom seen with horns. As in other countries, we meet with finer cattle on some farms than on others; but (he adds) from every observation I could make, and information I could obtain, the Iceland farmers know nothing of the art of breeding stock. The bulls are in general ugly, and no use is made of them till after they are five years old. In rearing a bull calf no more attention is paid to him than others. Taking all circumstances of management together, I had some reason to be surprised to find the cattle, upon the whole, so handsome. The cows in general yield a considerable quantity of milk; many of them

ten or twelve quarts a-day, and some a good deal more."

In another place the same writer observes:—"The cow, horse, and sheep, afford the principal source of wealth, comfort, and subsistence to the Icelander. A cow on the farm of the Amtmand Stephenson, we were assured, gave regularly every day twenty-one quarts of milk. Their value is well known and appreciated by the Icelanders, who take the greatest care of them in the winter, and seem to shake off their habitual listlessness while employed in gathering in the hay that is to support them through the inclemencies of that season."

In no country, however, are cattle more carefully attended, or held in greater regard for their utility, as far, at least, as the dairy is concerned, than in Switzerland; and the intelligence of these animals, exposed as they are to various dangers on the steep acclivities of the mountains in that romantic land of glaciers and torrents, has attracted the notice of many travellers. An interesting picture is given by Latrobe, in his 'Alpenstock,' of the cattle of Switzerland, and their general management. It would appear that it is usual to hang *bells* round the necks, both of the cattle, the sheep, and the goats; these vary in form and size, from the small tinkling ornament tied round the neck of the pet goat, or pet lamb, to the large, heavy, and deep-toned bell of the leader of the herd.

The sounds of these bells, mingling as they often do with the dash of the mountain-torrent and the vocal melody of the peasantry, produce one of those charms which tend to render a journey through Switzerland so delightful and romantic.

These bells, however, are not intended merely to

give pleasure to the ear. When a cow happens to stray the vacher or his dog has always a guide in the bell, the slightest tinkle of which is heard at a great distance in those lofty and still regions.

The bell is considered by the animal herself as a mark of distinction and approval of good behaviour, and the deprivation of this ornament is felt by her as a punishment and sign of displeasure. This is very agreeably described by a recent tourist:—"The cow, whose superior beauty, sagacity, or good conduct seems to calculate her for the leader of the herd, is always on gala-days distinguished by the largest and finest-toned bell, and the bravest ornamental collar, and so down, through all the gradations of good, to the small appendage that marks the indifferently good or clever animal, and the total absence of ornament and distinction which points out the self-willed or vicious. If any cow has been guilty of straying, of unseemly behaviour, breach of discipline, or any vicious trick, the displeasure of the vacher is not testified by blows, but by the temporary deprivation of her bell; and this seldom fails to reduce her to order and prevent a repetition of the offence. It is only necessary to see the cow on a gala-day with her badge of distinction strapped round her neck, and then to see her deprived of it for some reason or other, to be convinced that this is true. She is now gay, good-humoured, and frolicsome, and then sulky and gloomy."*

The same traveller, who has paid very laudable attention to the habits and disposition of animals in the pastoral districts of Switzerland, tells a very amusing anecdote in further confirmation of the importance the cow attaches to her badge.

A certain cow, that had long worn the honour

* Latrobe.—Alpenstock, or Sketches of Swiss Scenery and Manners.

round her neck, had but recently given birth to a calf, and was considered too weak to bear the weight of her large bell, or, indeed, of any bell. Her master turned her out to go with the herd to the upland pastures. This summer removal of quarters is always held as a holiday. The peasants were dressed in their best clothes, the cows had on their bells, and all went on gaily except the poor matron who was deprived of hers. After proceeding a few paces she began to show signs of great uneasiness—this increased—it was vainly attempted to coax her forward, and soon she lay down on her side as though in a fainting fit. "In this dilemma one of the old vachers came up, and, seeing how the case stood, coolly went into the house, and brought out the bell and collar, which the animal no sooner felt about her neck than up she got, shook herself, and raised and crooked her tail over her haunches in token of complete satisfaction, went off prancing, kicking, and curvetting with every appearance of health and gaiety, and, taking her place in the van, was from that moment as well as ever."

The pastoral economy of Switzerland, which is common to Savoy and other alpine countries—the annual progresses of the shepherds and cowherds with their flocks to and from the mountains—are interesting and easy to describe.

The richer of the proprietors and breeders in the Alps possess tracts of pasturages, and sometimes houses, at different heights. In winter they live at the foot of the mountains in some sheltered valley, but this they quit in the spring, and ascend gradually as the heat brings out vegetation on the higher lands. In autumn they descend by the same gradations to the valley. Those who are less rich have a resource in certain common pastures, to which they send a number of cows proportionate to their

resources or means of keeping them during the winter. Eight days after the cows have been driven up to these common pastures all their owners assemble, and the quantity of milk each cow produces is accurately weighed. This operation of weighing is repeated one day in the middle of summer, and again at the end of the season. The milk of all the cows has meanwhile been put together and made into butter and cheese, and this common product is divided into shares according to the quantity of milk each owner's cows yielded on the days of trial.*

The chalets, or public dairies, on these common pastures, have always some persons residing in them during the summer months, when the churn and the cheese-press are scarcely ever idle. Some of them are in such lofty situations, that to go to them and return to the valley below requires the labour of a whole day. The cheese is made in copper cauldrons of an enormous size, and is itself formed into masses inconveniently heavy. A cheese weighing two hundred pounds is by no means a rarity in the mountains of Savoy and Switzerland, and in some of the chalets such a cheese is put into the press every day during the summer season.

The cows are milked morning and evening. At the approach of sunset they may be seen slowly traversing the mountain pastures from every quarter, and all going, apparently of their own accord, to the chalet to be milked.

In some parts of Switzerland, and more particularly in the retired parts of the forest cantons, the peasants, to collect their herds, make use of an alphorn. This primitive instrument is a wooden tube about five feet long, and of the most simple

* Saussure, Voyage dans les Alpes.

construction. Its deep, mellow, and prolonged note, heard at a distance floating over the upland pastures, and frequently echoed in succession by many crags and rocks, makes a pleasing impression on the traveller. On many of the higher Alps this horn is sounded regularly at sunrise and at sunset. At whatever part of the day it is blown, to collect the cattle, the cows are seen, as soon as its note can reach their ears, scampering away for the chalet—often at a hard gallop.

A correspondent informs us that he once witnessed the evident dismay of a cow at not being able to obey the summons. She was a very pretty young creature, and was lying ruminating in a little dell, by herself. Presently the alphorn was heard, and the peasant who sounded it was seen a little in front of a chalet that stood on a green hill at no great distance. The poor creature instantly rose, but could not proceed, for she was lamed and sorely wounded, most probably by some fall she had met with. After dragging herself along for the distance of a few yards, she stood still and lowed—the horn sounded again, and again, making a great effort, she went on a few yards—then she laid herself down and lowed most piteously, fixing her eyes all the time on her companions who were running from every direction to the chalet. The poor creature seemed to be suffering not merely from her hurts, but also from that pain a punctual person feels on breaking an engagement or failing in the performance of a duty. The traveller hurried to the chalet to tell the peasants what had happened, and returned with them to see them assist the grieving absentee. By the time they reached the dell she had made a little more progress, but was again prostrate on the ground, and lowing in a melancholy manner. When the peasants came near to her she rose up and ceased her complaints at

once, and though, with all the aid they could give her, she was obliged several times to lie down again, she did not repeat them, and at last she reached the dairy, where she lowed in a very different tone.

These cows in the Alps, like Merino^e sheep in the mountains of Spain, are said to know so well the proper season for shifting their quarters and seeking the milder climate of the valleys, that when it arrives they would set off themselves and return direct, each to its winter station, if not conducted.

We need scarcely inform our readers that the 'Randz des Vaches,' the celebrated national air of the Swiss, which, when heard by them in a foreign country, has often been known to affect them so deeply as to cause a lingering malady, is nothing more than a peasant's vesper summons to his cows.

The main exports from Russia to England are "tallow and hides." In that extensive empire, cattle are reared in vast numbers, but principally in the more southern provinces. In the districts adjacent to Moscow, and also to St. Petersburg, few cattle are reared, and the markets there are supplied by cattle sent from distant parts of the country. The herdsmen live in a state of barbaric simplicity, and are, in fact, nomadic in their habits. They travel with their herds to St. Petersburg, Moscow, and other towns, which depend more upon them for a due supply than upon the farmers of the adjacent districts. The following extracts from Johnston's 'Russia' will convey a good idea of the subject:—
"Along the road we passed one or two large droves of horned cattle proceeding to St. Petersburg. We learned that they were brought from the provinces south of Moscow. These cattle are all of a whitish colour, large, well made, and of about seven hundred-weight. Their journey to St. Petersburg generally

occupies three months. They travel about eight to sixteen miles during the night, and are allowed to pasture and rest during the day on the sides of the road. The flocks are attended by one or two men, who convey their cooking utensils, baggage, &c., in a waggon drawn by two oxen; and, while their numerous flocks, undisturbed, repose under the shade of the delicate birch, they stretch themselves on the ground, and pass their time in a true Scythian state. Here are also seen a few sheep, but of an inferior breed, and covered with hair somewhat like that of a goat. This country is not favourable for the pasture of sheep, owing to the coarseness of the grass and quantity of wood. Little or no attention seems to be used in the rearing of any other domestic animal besides the horse. To him alone the Russ devotes his whole attention, and from him he derives his livelihood."—p. 195.

In Spain and Portugal, where extensive wilds and forest-lands afford ample pasturage, large herds of oxen, born in freedom, wander uncontrolled and untroubled; save by the presence of man, from whom they flee with precipitation, until roused to fury by his assaults, when they attack in turn, and bear upon him with resistless impetuosity. It is from these herds that the Spaniards and Portuguese select the fiercest and boldest for the revolting contests of the arena; while others are taken and tamed for the ordinary purposes of husbandry. With respect to the bull-fights of the peninsula, the cruelty of which nothing can justify, and the moral effects of which cannot be sufficiently censured, they are evidently the lingering relics of those contests in which Rome and the Italian cities of old so much delighted, and which spread with the extension of the Roman empire. Among the animals slaughtered in the amphitheatre, to glut the appetite of the



Spanish Bull Fight.

Roman populace for blood, the wild bull was conspicuous. It was opposed to bears and other savage beasts as well as to men; and the Spanish bull-fight may be regarded as at once a continuation and exemplification of the sanguinary spectacles there exhibited.

Of the many descriptions of this sport, which, barbarous as it is, is not only tolerated but encouraged by the higher classes of both sexes in Spain, none exceed the spirited and masterly one by Lord Byron, in the first canto of 'Childe Harold.' Sir J. C. Hobhouse, in a note on the passage enters into the following details:—

“The magistrate presides, and after the horse, men, and piccadóres, have fought the bull, the matadore steps forward and bows to him for permission to kill the animal. If the bull has done his duty by killing two or three horses or a man, which last is rare, the people interfere with shouts, the ladies wave their handkerchiefs, and the animal is saved. The wounds and death of the horses are accompanied with the loudest acclamations and many gestures of delight, especially from the female portion of the audience, including those of the gentlest blood. Everything depends on habit. The author of Childe Harold, the writer of this note, and one or two other Englishmen who have certainly in other days borne the sight of a pitched battle, were, during the summer of 1809, in the governor's box at the great amphithéâtre of Santa Maria opposite to Cadiz. The death of one or two horses completely satisfied their curiosity. A gentleman present, observing them shudder and look pale, noticed that unusual reception of so delightful a sport to some young ladies, who stared and smiled, and continued their applauses, as another horse fell bleeding to the ground. One bull killed three horses *off his own*

horns. He was saved by acclamations, which were redoubled when it was known he belonged to a priest!

“An Englishman who can be much pleased with seeing two men beat themselves to pieces cannot bear to look at a horse galloping round an arena with his bowels trailing on the ground, and turns from the spectacle with horror and disgust.”

A well-regulated mind would find pleasure in neither spectacle,—to revolt from them with disgust implies no deficiency of courage, nor, on the contrary, is a fondness for the exhibition of bloody contests a proof of its being possessed.

Another variety of bull-fighting, or rather a substitution of bull hunting for the former, is thus described by a correspondent in the Penny Magazine. It is too interesting to be here omitted.

“The Spanish bull-fight has been often described, but that species of bull-fight which, while it affords pastime to the people, subdues the noble animal to be a partaker of the labours of the husbandman, is we believe, little or not at all known in this country. The peninsula abounds with extensive forest-lands, which, though reaching over a wide extent of country, is sufficiently open to afford pasture and food to herds of wild cattle who roam almost unmolested amongst their shades. The great forest of the Alemtejo is an apt illustration. In this some hundreds of square miles of country are occupied by growing timber; but within its bounds large open spaces exist which serve for pasturages, and occasionally a farm, a vineyard, or an olive-grove may be seen struggling, as it were, for existence amidst the vast solitudes. But though occasional glimpses of culture appear, they are far too few and far between to offer any serious check to the increase and independence of the herds which roam around them

undisturbed. It was in this forest that I witnessed for the first time the method of capturing the wild bulls. I had received intimation that the village of Alcoxete, on the Tagus, was to be the scene of a bull-fight, and that the villagers for many miles round were invited to join in the hunt, which was to take place on the following day. I accordingly crossed the river in company of about twenty persons, mostly military, each being provided with a long pole, having a small spike fixed in one end, and mounted as inclination or ability suited. When we arrived on the opposite bank, a little before day-break, we found about 250 or 300 persons assembled, some mounted on different sorts of quadrupeds, from the noble Andalusian horse to the humble hack donkey, and very many on foot. They were all armed in a similar manner to ourselves. As soon as daylight began to appear we all marched off towards the forest. The morning was peculiarly fine, and the interest of the beautiful scenery was heightened by the varied costumes of the persons by whom we were surrounded. As soon as we had advanced some distance into the wood we halted for the purpose of refreshment, before the arduous and somewhat perilous duties of the day began. After a hasty meal we divided into two parties, one stretching in a long line to the right and the other to the left. We had not advanced far in this manner before we fell in with a herd of cattle having twelve bulls with it, which no sooner descried us than they bounded off with the speed of lightning. The sport had now begun; we put our horses to the utmost speed, threading our way amongst the tall pine-trees as well as we could, and endeavouring by wild cries to drive the bulls towards the other party. At length, after about an hour's chase, some half-dozen of us who were better mounted than the rest came up

with them, and commenced the attack with our long poles. The manner was this:—One person riding at full speed gave the bull nearest him a sharp prick with the goad, which it no sooner felt than it turned upon its assailant and gave chase; another horseman then coming up attacked it on the other side, when, leaving the first assailant, it turned upon the second; he in like manner was rescued by a third, and so on. The attention of the infuriated animal thus distracted prevented his escape, and gave time for the other hunters to come up. The bulls were thus at length separated from the herd. A sufficient number having arrived to form a circle round them, we commenced operations for the purpose of driving them towards the town: all the skill of the riders was now necessary, and all the activity possessed by both man and horse, to keep clear from the pointed horns which on every side were directed against him, as well as to prevent the herd from breaking through the living net with which it was surrounded. This was perhaps the most difficult part, and was attained by keeping each bull separately engaged, and thus preventing united action; for what line was sufficient, armed as we were, to resist the simultaneous rush of these most powerful animals? The continued activity and exertion requisite had knocked up many of the poor jades who had started in the morning, and the circle became smaller and smaller as the day advanced; several, too, had been carried off severely gored and wounded by the horns and feet of the bulls. I, however, and the party with whom I started, were resolved to see the conclusion, and redoubling our efforts, we at length, about four o'clock in the afternoon, succeeded in driving them into an enclosure where were a number of oxen (all at one time wild) with bells, quietly grazing. Here

they were kept till required for the next day's sport.

“The square of Alcoxete had been fitted up in the form of an arena, with seats, or rather standing places, all round; the centre was carefully cleaned, all stones removed, and fresh sand strewed. At one side a cart was stationed for a purpose to be presently described; at the other a pen was fitted up for the reception of each bull as it was to make its appearance, communicating by a door with the place where the herd was enclosed. The difficulty of bringing the bulls from their temporary resting-place to the scene of their humiliation was not less than that of their original capture. Through the forest they had only the trees and shrubs before them, to which they were accustomed; and, if the line of huntsmen alone was sufficient to awaken their rage and terror amidst scenes familiar to them, how much more must those feelings have been excited when passing through the streets of a town crowded with people, the houses gaily decorated with red, blue, white, and green hangings, and greeted with a thousand tongues in the joyfulness of expectation! Twice the terrified and furious herd turned and dashed through the assembled crowd, tossing and goring all who ventured to oppose them, and twice the circling horsemen brought them back. One fine black bull took to the river and swam out about two miles before a boat could be put off to recapture it. Several of the English soldiers who were quartered near the town swam after it, and one of them, an excellent swimmer, had nearly reached it, when a fishing boat came up, and fixing a cord round the bull's horns, towed it in. The soldier, however, was resolved not to have his trouble for nothing, and, mounting on its back, was landed safely amidst the

shouts of the spectators. The sport of baiting the bulls for the purpose of taming them began at three in the afternoon, when the heat of the sun had somewhat abated. Six of the wild animals were ushered into the circus, surrounded by a band of mounted picadores, and accompanied by several tame cattle with bells, when one by one they were secured with cords to the cart, and a leathern cap placed on the points of the horns, after which they were all driven into the pen. The circus was then cleared, and the Spaniards entered, gaily attired in the Andalusian costume, the grace and elegance of which must be seen to be properly understood. The hair, which is worn long, is confined in a black silk bag, which is fastened with bows of black riband: the light-coloured velvet jacket, covered with gold lace and silver-gilt buttons, the velvet vest richly embroidered, the lace shirt, red silk sash, velvet breeches, and silk stockings; all harmonising in colour and form, set off the figure to the best advantage and add to the grace and elegance for which the Andalusian is so justly celebrated. These men, of whom there were five or six, are accustomed from their infancy to the dangerous employment of bull-fighting, and the agility and dexterity displayed in evading the furious attacks of the bull are astonishing. After carefully examining the arena they each armed themselves with four short barbed darts, and waited for the coming of the bull: they had not to wait long; the door was thrown open and the animal rushed into the centre, greeted by the shouts and vivas of the spectators. One of the Spaniards advancing, invited the attack, when the bull, who at first, bewildered and amazed, had stood tearing up the earth with its feet till almost hid from view by the cloud of dust, lashing itself into fury with its tail, rushed upon its opponent. All who were not

accustomed to such spectacles thought the man must inevitably have perished; but just as the long and powerful horns seemed to touch his body he stepped nimbly aside, and, turning smartly round, planted all four darts in the animal's neck just behind the horns. Loud shouts of applause rewarded his dexterity, and the bull, more enraged than ever, ran round the area tearing up the earth and bellowing with rage, until encountered by a second picadore with like success. After the Spaniards had exhausted themselves in exciting the rage of the bull, they quitted the area, and the populace were admitted to throw the bull: this was generally done by one man leaping between the horns, upon which he supported himself in an upright posture till relieved by his companions, who threw the bull to the ground. The cry of 'largo, largo,' was the signal for its liberation, when, some tame cattle being admitted, it was led by them to the pen. Six



bulls were thus baited the first day, the other six on the day following. Three weeks afterwards I had these very animals under my charge as baggage-oxen, as tame and gentle oxen as could be desired."

In Portugal the spectacle of the bull-fight is as captivating to the people, and as much in accordance with the taste of the public, as in Spain. Nor is there much difference in the management of the affair. It is a scene of barbarity unatoned for, even by the coolness, courage, and consummate address of the daring men engaged in the mortal contests.

We need scarcely observe that the ox, with every other domestic quadruped, is strictly an aboriginal of the old world;* hence before the colonization of America by European adventurers, the llama, and that merely in the Andes of its southern division, was the only substitute for the ox and the horse and the sheep, serving, at the same time, as a beast of burden, affording its flesh as food, and its fine wool for the manufacture of articles of clothing. The llama, however, limited in the range of its habitat to the Cordilleras of Peru and Chili, cannot be regarded as having really filled up the place of any one of these animals in the New World, though it did so in a partial degree within a given range. Since the introduction of the horse, the ass, the mule, and the ox, the use of the llama has gradually declined, and is now almost, if not entirely, discontinued, at least as a beast of burden. The ox was one of the first of the domestic animals carried over to America by the early Spanish settlers: there

* An exception may be taken to this remark in favour of the dog. The history of the dog is still a problem: it is found wherever man dwells; and there is reason to conclude that it is not from one type that the various breeds have sprung, but that a type or distinct origin is aboriginal in distinct portions of the globe.

it has multiplied and spread, and, indeed, in some degree, recovered its original independence. Herds of wild oxen wander over the pampas, where they are hunted and slain for the sake of their hides, which form an important article of commerce. These wild herds, in some districts, are exceedingly numerous; they differ in no respect from their domestic relatives, and are themselves rendered tame without much difficulty.

It is a curious and interesting feature in the history of the New World that so many of our domestic animals, not known in a wild condition in the Old World, should there have returned to their primitive independence. The ox, the horse, the ass, the cat, and even the dog, have thus estranged themselves from the control of man. Individuals have at different times escaped from confinement or been neglected: abundance of food and a congenial climate were favourable: a vast region lay unexplored around,—freedom was before them,—they multiplied, and their offspring in turn; and thus, through the agency of man, have the plains of the New World been peopled by alien races of animals, which to the red Indian of the forest were till then unknown.

The following particulars respecting the introduction of the ox into South America, and the circumstances connected with its subsequent extension, as detailed by D'Azara, in his work on the 'Quadrupeds of Paraguay,' will be read with interest. His statement is as follows:—

“ Captain John de Salazar, born in the city of Pomar, in Arragon, transported from Andalusia seven cows and a bull to the coast of Brazil; from thence he conducted them overland to the river Parana, at the place opposite to where it receives the river Mondai. He there constructed a raft,

placed the cattle on it, and gave them in charge to a certain Gaëté, whilst he himself went by land to Paraguay. Gaëté descended the Parana to its union with the river of Paraguay, and, steering up this, he arrived safely at the city of Assumption in 1546. He spent many months in this voyage, and, as he had only one cow given him for payment, the saying has hence arisen, in making allusion to the great value of anything, 'It is dearer than Gaëté's cow.' Such, then, is the origin of all the horned cattle of these countries, where they have prodigiously multiplied, and where they are simply termed *cattle*.

"The second founders of Buenos Ayres took, in 1580, some cows from Paraguay, which multiplied in the neighbourhood, and, from want of due care, many of them became wild, and bent their course towards Rio Negro. The Indians of the Cordillera of Chili became acquainted with these animals, which had already attained their boundaries, and they commenced to carry from them herds of tamed cattle to Chili, where the presidents of this settlement purchased them from these Indians. Those Indians who could not live in their country without some resource, established themselves in the plains, which were occupied by these cattle, and some even mixed with the Pampas Indians.

"In the mean time the Indians who were unsubdued destroyed the cattle to the south of Buenos Ayres; the Spaniards of those parts, however, did not neglect to take a portion, which they conducted to Cordova and Mendoza, whilst the Spaniards of Buenos Ayres made up entire cargoes of the hides of bulls and cows, for at that time the animal itself was not considered of value, its skin being all that was sought after. The result of all this (and the same will soon take place at Montevideo) was, that

towards the middle of the century, wild cattle no longer existed in the Pampas, and the unsubdued Indians saw themselves under the necessity of stealing the domestic animals, or of making incursions into the *estancias* of the Pampas. This was the commencement and cause of the bloody war which the Spaniards had with the Indians.

“The herds of these *revolted* or wild cattle, which are also called *oreillards* in the plains of Montevideo, do not pass to the north of the southern establishments of the Guaranis Missions. The following is the account which I have collected of their origin. The city authorities of Buenos Ayres, in the name of *certain of its inhabitants*, as is proved by its archives, made, at the commencement of the century, contracts, on the one part, with the English, for the acquisition of Negroes, and, on the other part, with certain Spaniards, who were thus authorised to procure the hides of the animals on the plains situate to the north of the River de la Plate on payment to the city of a certain tax, of which the sum total was shared between *these Spanish inhabitants*, who from this circumstance were called *Actionnaires*. The primitive source of this right or this proceeding is not known, but certain it is that all the inhabitants did not participate in it, and that its produce was the exclusive share of these *Actionnaires*, who were the descendants of the earliest of the original settlers.

“For the elucidation of this affair it is necessary to consult history. We learn from it that Captain Jean Roméro set off from Paraguay, and, with his associates, founded, on the 24th of June, 1552, the city of St. Jean-Baptiste, opposite the spot where Buenos Ayres exists, at the mouth of the river St. Jean, and that the Indians attacked this city, and constrained the inhabitants, in the month of October

of the same year, to abandon it with precipitation, and re-embark for Paraguay. There is reason to believe that the haste with which they fled, and the danger surrounding them, did not permit them to take away some cows which without doubt they had, and which they abandoned. In the year 1580, fifty soldiers set off from Paraguay, and founded Buenos Ayres; and it may be presumed that among them were some of those who had been at St. Jean-Baptiste, or of their heirs or descendants, who, on that account, had a right to the cattle in the plains of the same name; and that they were called *Actionnaires*, by way of distinction from those who, not being descendants of the founders of St. Jean-Baptiste, had not a similar right. Such is, in my opinion, the origin of the cattle of the north of the River de la Plate, since nothing goes to prove that any inhabitant of the southern parts had anciently transported cows thither; besides which it was very unlikely they should have done so, having, on the one hand, fertile plains in their neighbourhood, and, on the other, but very few vessels. In these countries salt is not given to the herds of cattle, but they require absolutely to have the *barrero*, for so is called a saline or nitrous earth, which the herds of horned cattle, and even other animals, seek with avidity, and without which they fail, and die in the course of four months. From the twenty-seventh degree of south latitude to the Malovine Islands, the horned cattle, as well as other animals, have no need of the *barrero*, because the waters and the pasture-grounds are sufficiently salt; but northward, beyond this latitude, the *barrero* is necessary, and the plains which do not contain it, do not feed either the horse, the ass, the mule, the ox, the goat, or the sheep. The eastern half of the province of Paraguay is des-

titute of *barrero*. It would appear that such is the case over the greater portion of Brazil,* which is the reason why so few cattle are reared there, and also why those that are have, as Buffon observes, diminutive stature, and ill-flavoured, disagreeable flesh. This author attributes these defects to the use of wild gourds as food in default of pasturage. But, in the first place, there is not a sufficiency of gourds for the purposes alluded to by Buffon; and besides, there is there neither a barrenness of pasturage, nor any other deficiency than that of the *barrero* or salt. Setting aside this, cattle prosper in any district, even in the low and boggy land where good pasturage and pure water are found. But they prosper better in temperate, and even cold situations, as I infer from this that the cattle of Paraguay, although large, do not appear to me to be so large as those of Montevideo, where they occur somewhat larger than at Buenos Ayres. Buffon thinks that these cattle have degenerated, and that these animals are inferior in size to those of Europe. † If he had seen the hides which are imported from this quarter most assuredly he would talk in another manner. In fact, the cattle of Montevideo, are, in my opinion, larger than those of Salamanca, although the bulls here are neither active nor so fierce.

“I am talking of cattle generally, and not of the dwarf race, which I have seen in the Corrientes, which, though it is much lower on the limbs, nevertheless as stout, and even more stout and bulky in the body, than the common race. The

* In some parts of Brazil cattle are reared in great abundance.—See Spix, Koster, &c.

† Province situated at the north-west extremity of the province of Buenos Ayres.

race, which multiplies, has doubtless originated from the common breed, and if it intermixes with it a mongrel race is the result."

"There are also many oxen in the province of Chiguitos, between the fifteenth and seventeenth degrees of latitude, but I know not their size. I say the same thing with respect to the Malovine Islands, where we have transported some heads of cattle, which, in 1780, already amounted to the number of 800, and which at present, in 1795 (*old style*), are upwards of 6000. There, neither shelter, nor covert, nor food is given them, and they have learned to dig in the snow in order to get to the vegetation beneath it. This experience is an argument for establishing that horned cattle not only prosper in cold countries, but also that the assertion of Buffon, that they become acclimated with more difficulty in snowy climates than horses, is erroneous.

"Wild cattle are such as live in vast troops at perfect liberty, flying from the appearance of hunters on horseback, and changing their place of abode when it suits them. In comparing these with domestic cattle, I see no difference either in size or anything else; nor is this strange, inasmuch as there is no difference in their general mode of life. . . . A herd of wild cattle become tame in less than a month. The colours of these cattle are limited to dusky, or to reddish on the upper parts, the rest being blackish.* Buffon says that the wild cattle of Africa, found at Cape Blanc and at Sierra Leone, are usually brown; and that*those of Barbary and Numidia are dusky chestnut, colours which are pretty nearly the same as those above described." Besides these truly wild herds there are others in a sort of semi-domesticated condition, which are tended by keepers, and constitute valuable property; their

hides, tallow, horns and flesh being all in requisition.

“ A grazing ground (*estancia*) of 15,000 *varres*, (or yards) in length, and 5000 *varres* (or yards) in breadth, (that is to say of two square maritime leagues,) can feed, it is said, 4000 head of cattle, under the direction of a superintendent and four men. The ordinary duty of these five individuals, a duty requiring a hundred horses, is to collect the herd once a week, driving them from all quarters to an elevated and open space which is termed the *rodéo* (or circuit). This is not a work of great trouble, because a horseman, shouting as he gallops along, makes them run of themselves towards the *rodéo*, and they do not stop until they reach it. . . . At Paraguay, where there is much forest-land, the herds of horned cattle take refuge in the woods during the winter, and leave them in September, pursued by gad-flies, and by an infinite multitude of insects. In order that the cattle may be provided with a crop of tender grass the plains are fired; and if it happens that the conflagration encircles a herd of cattle, they dare the flames and dash through; the contrary is the case with horses and mares, which remain in the circle, violently kicking, until they are burnt to death. The horned cattle suffice here for almost every necessary of life; the greater part of the population neither taste bread, nor anything else besides flesh-meat. With the horns are made goblets, spoons, and combs; and with a cork at the large end, the small end being opened, a horn serves as a pitcher;—a vessel to hold water. The inhabitants form out of the hide all sorts of cordage and string, as well as the greater part of their utensils; on these hides they sleep, and with them they cover their cabins. The fat supplies the place of oil (for culinary purposes); of the suet they make soap and

candles; the bones are a substitute for fire-wood in many places where the latter is wanting, and they are made to burn by the addition of suet; the skulls are used as chairs in the *estancias*. From the milk they make many various dishes of curds, which though in general not very excellent (because the milk, the cream, and every unctuous particle are removed), might be as good as in Holland: and the same may be said of the butter."

"It is known that from Buenos Ayres and Montevideo 800,000 ox-hides are annually exported to Europe. . . . In order to obtain these hides, some horsemen join together and arrange themselves in two ranks which form an angle; they then press on the two sides a small number of cattle, and one of the horsemen who goes last in the angle hamstring the animals with a knife in the shape of a crescent or half-moon, fastened at the end of a staff. While this goes on the horsemen continue to ride forwards, and when they have thus secured a sufficient number of animals, they retrace their steps; and the person who hamstrung them gives each beast thus maimed a finishing stroke with a sharp spear, and the horsemen dismount to strip the carcass, sometimes of the fat and suet, but always of the skin: this they do with such dexterity, that some men without assistance will strip twenty-six cattle at a day's work. When a single head of cattle is to be killed for the sake of its flesh, a horseman throws a lasso over its horns or neck, and another does the same over one of its feet; then straining in opposite directions they prevent it from struggling free and so strangle it. Admirable is the dexterity with which, when the animals pass as they rush forwards the lasso is thrown, so that directed backwards under its feet, the animal at the pleasure of the horseman is entangled either by one foot or by two together."

Every writer upon the natural productions of South America gives nearly the same account of the horned cattle of other districts in that portion of the globe, as is done by Azara respecting those of Paragnay.

The Brazilian traveller, Von Spix, in his description of a 'Journey from the City of S. Paulo, to the Iron Foundry of Ypannema,' observes, "The breeding of cattle is the principal occupation of the inhabitants. Every landholder possesses, according to the extent of his farm, from several hundred to two thousand, nay even forty thousand head of cattle. They generally reckon from three to four thousand head on an estate which has two square miles of good pasture. All these roam at *liberty* in a *wild state*; but every farmer keeps, besides, as many tame draught oxen and cows as he requires for the purposes of agriculture and for milk, which is partly made into cheese. The attendance on the wild cattle gives but very little trouble—all that is required is to brand them with the mark of the owner, to castrate the bulls, and to catch the animals intended to be slaughtered. From four to six servants, under the direction of a chief cowherd, perform all these services; they prevent the herds from straying beyond the boundaries, and defend them against the attacks of the ounces, wolves, and wild dogs. These people are almost always on horseback, as their office compels them to ride twenty miles or more in a day. Every year the whole herd is collected at different times, in a place in a high situation, and sometimes fenced in; on this occasion the mark of the owner is branded on the hind quarter of the beasts one year old, of which they reckon a thousand annually for a herd of five or six thousand; those two years old are castrated in a very rough manner, and those of four years old and

more are selected for slaughter. The catching of these latter, a frequently troublesome and dangerous employment, is executed here as in the Pampas of Buenos Ayres, by means of long leathern nooses, which the farmers' servants manage with incredible dexterity. The tame cattle are kept in the vicinity of the fazenda, run free in the meadows during the day, and are only shut up in an inclosure at night. The flesh of the tame cattle is preferred to that of the wild, because, from their undisturbed and more quiet life, they grow fat sooner, and with less fodder. The pasture being so good, their milk is excellent, but a cow gives only a third part of the quantity that good milch cows give in Europe. The hide is always the most valuable part of the cattle; it is stripped off, stretched upon the ground by means of short pegs, a little salted, and dried in the sun. The flesh, cut into thin strips, a little salted, and dried in the air, is an important article of exportation from the harbours of S. Paulo and Rio Grande do Sul, to the cities in the north, particularly to Rio de Janeiro, Bahia, Pernambuco, and Maranhão, where, under the names of Carne Seca do Sertão, Passoca, or Carne Marquada, it constitutes an essential part of the subsistence of all the Brazilians, but especially of the negro slaves."

The same writer, in another place, alludes to the circumstance that, with abundance of cattle, the cows yielding rich milk, the Brazilians have not succeeded in making butter, or establishing a dairy in the European manner; even the emperor, who possesses in his very neighbourhood one of the finest herds of cows, must content himself with Irish salt butter, which has performed a voyage of several months.

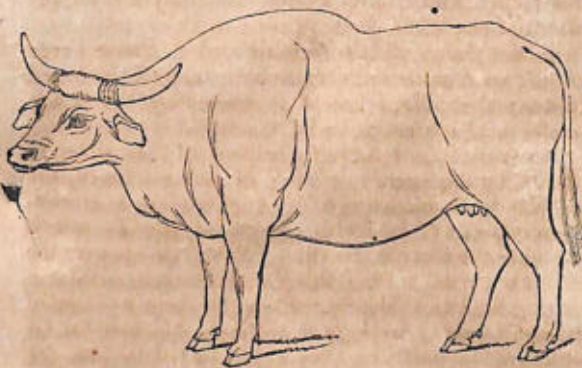
It is a singular circumstance that in very hot climates the cow yields less milk than in Europe; and Von Spix affirms that cows taken immediately

from Europe to Brazil lose their milk; a fact, he adds, which is probably to be explained by the predominant action of the cutaneous system and increased perspiration. Perhaps, we may observe, the nature and quality of the diet may be an influential cause.

In the plains of Rio Grande and S. Paulo herds of half wild cattle are very numerous, and the breed is fine; their management in these districts is the same, or nearly so, as in Paraguay.

America is not the only portion of the globe to which, by the agency of man, in modern times, the ox has been introduced. We allude to Australia, New Zealand, and the groups of islands which sprinkle the Pacific Ocean. "With the appearance of Vancouver," says Otho Von Kotzebue, speaking of the Sandwich islands, "arose the fortunate star of these islands. Among the innumerable benefits he conferred upon them, they are indebted to him for the possession of sheep and cattle; Tameamea (the native king) declared these animals under a *tabu* for ten years, which allowed time for so large an increase that they now run wild in the forests." Of the benefits resulting from the introduction of the ox into a country naturally destitute of it, nothing need be said; but the gift of cattle to a people who, though yet uncivilised, are yet capable of appreciating their value, is to commence a revolution in their state and condition immeasurably for the better: for the possession of property is one of the bonds of society, and the desire of acquiring it the great stimulus to industry. With the introduction of the ox, the condition of the people of these islands must necessarily be improved. Not only will cattle be reared for home consumption, but for supplying the ships that navigate these seas (whalers, &c.), other valuables being given in exchange; hence will

the rearing of cattle be generally undertaken; this involves care, attention, and a state of peace; agriculture and commerce follow, and prepare the way for the arts of civilised life.



Gyal, or Gyall.—From *Asiatic Researches*, vol. viii.

We cannot leave the ox without a notice of two remarkable species, used in a domestic state in certain parts of India, which are at the same time tenanted by the same animals in a wild condition. The species to which we allude are the gyal, or gyall, and the yak. In the seventh volume of the Linnæan Transactions will be found the figure and description of a gyall (which died in London in the year 1802), by A. B. Lambert, Esq., who quotes the following letter from George Harris, Esq., who was acquainted with the domestic gyall in its native country. The letter is as follows: referring to a communication from Mr. Lambert, he says, "I have before me your note, with the drawing, which undoubtedly appears to me to be the figure of the animal I mentioned to have, in my possession. Some

parts of the drawing seem to be rather too much enlarged, as the base of the horns, and the rising between the fore-shoulders. The animal I described to you, and which I have kept and reared these last seven years, and know by the name of the gyall, is a native of the hills to the north-east and east of the Company's province of Chittagong, in Bengal, inhabiting that range of hills which separates it from the country of Arracan. The male gyall is *like our bull in shape and appearance*, but I conceive not quite so tall, and of a blackish colour; the horns short, but thick and strong towards the base, round which, and across the *frons* (chaffron), the hair is bushy, and of a dirty white colour. The chest and forehead are broad and thick. He is naturally very bold, and will defend himself against any of the beasts of prey. The female differs little in appearance: her horns are not quite so large, and her make is somewhat more slender; she is very quiet, and used for all the purposes of the dairy, as also (I have been informed by the natives) for tilling the ground, and is more tractable than the buffalo. The milk which these cows give has a peculiar richness in it, arising, I should conceive, from their mode of feeding, which is always on the young shoots and branches of trees in preference to grass. I constantly made it a practice to allow them to range abroad amongst the hills and jungles at Chittagong during the day to browse, a keeper attending to prevent their straying so far as to endanger losing them. They do not thrive in any part of Bengal so well as in the afore-mentioned province, and in the adjoining one, Tipperah, where I believe the animal is also to be found."

The other animal, the yak (*Bos grunniens*), is a native of the mountain regions between India and Tartary, where it still continues in an unreclaimed

state, while a domestic race is reared by the inhabitants, to whom it is of the highest value. Its remarkable peculiarity consists in the tail being furnished with full flowing hair, of great length and considerable fineness, mostly of a white colour, but sometimes black. In general form the yak is not unlike the buffalo, but instead of being sparsely clad, is covered with a coat of thick hair, elongated into a mane down the back, and on the chest and under surface of the body; the horns are short, smooth and round; they taper up with an inward flexure towards each other, the points, which are sharp, being turned slightly backwards. The ears are small; the forehead is adorned with curly hair; the eyes are large, the muzzle almost altogether hairy, and the nostrils small. The colour, at least of the domestic race, is subject to variety, the skins which we have seen have been of a dark brown, the tail being white; except in one instance, when the tail was black. In size the yak is inferior to our common ox, and much shorter in the legs; but it is stoutly made, and is a powerful animal, and when wild, savage and dangerous. Its long flowing tail forms the standard of battle among the Mongols, and regulates the distinctions of rank, the pachas being classed as those of one, two, or three tails.

In India these tails are mounted on ivory or silver handles, and are, as fans, called "Chowries," used to brush away the flies; elephants of state being taught to carry a splendidly mounted *Chowrie* in their proboscis, and wave it backwards and forwards. It is the opinion of many naturalists that the animal from India described by Ælian under the name of *Poephagus* is the yak; it is noticed as an Indian animal, larger than a horse, with a very thick tail, and black, composed of hairs finer than the human, and highly valued by the

Indian ladies for ornamenting their heads; each hair is two cubits long. It is also characterised as being very timid and swift, and that when chased by men or dogs, and finding itself nearly overtaken it would face its pursuers, and hiding its hind quarters in some bush, wait for their approach, imagining that if it could conceal its tail, which was the object they were desirous of obtaining, it would escape unhurt. The hunters shot it with poisoned arrows, and when they had slain the animal, took only the tail and hide, making no use of the flesh.

In this account we have not only much fable, but also some points of description very inapplicable to the yak. For instance, it is *not* larger than a horse, nor are the hairs of its tail of such *exquisite fineness*, nor is it a timid animal. Pallas states those which he examined to have been of the size of a small domestic cow, and this statement is correct, as the skins we ourselves have seen sufficiently prove.

Of the habits of the yak in a state of freedom little or nothing is known. Few Europeans ever penetrate into the remote alpine regions of Thibet; and the occasional traveller has his own personal safety to attend to, so as to deprive him of opportunities of observing a wild and suspicious animal secluding itself in the recesses of the hills. As regards the domestic yak, Turner in 'Account of an Embassy to China,' after giving a description of it, observes that "these cattle, though not large boned, seem from the profuse quantity of hair with which they are provided to be of great bulk; they have a downcast heavy look, and appear, what indeed they are, sullen and suspicious, discovering much impatience at the near approach of strangers. They do not *low* loud like the cattle of England, any more than those of Indostan, but make a low grunting noise, scarcely audible, and that but seldom,

when under some impression of uneasiness. These cattle are pastured in the coldest parts of Thibet upon the short herbage peculiar to the mountains and bleak plains. The chain of mountains situated between the latitudes 27° and 28° which divides Thibet from Bootan, and whose summits are mostly clothed with snow, is their favourite haunt. In this vicinity the southern glens afford them food and shelter during the severity of winter; in milder seasons, the northern aspect is more congenial to their nature, and admits a wider range. They are a very valuable property to the tribes of itinerant Tartars called Duckba who live in tents, and tend them from place to place; they at the same time afford their herdsmen an easy mode of conveyance, a good covering and wholesome subsistence. They are never employed in agriculture, but are extremely useful as beasts of burden, for they are strong, sure-footed, and carry a great weight. Tents and ropes are manufactured of their hair, and amongst the humbler ranks of herdsmen I have seen caps and jackets made of their skins. The best requital with which the care of their keepers is at length rewarded, for selecting them good pastures, is in the abundant quantity of rich milk which they give, and in the butter produced from it, which is most excellent. It is their custom to preserve this in skins or bladders, and the air being thus excluded from it, it will keep in this cold climate throughout the year; so that after some time tending their herds, when a sufficient store is accumulated, it remains only to load their cattle and drive them to a proper market with their own produce, which constitutes to the utmost verge of Tartary a most material article of commerce."

CHAPTER VII.

THE BUFFALO.

WITH the true buffalo must not be confounded the Caffer buffalo or buffalo of the Cape (*Bos Caffer*, Sparrm.), which is a species entirely distinct and limited in the range of its habitat to Southern Africa.

The buffalo (*Bos Bubalus*, Linn.) is originally from India, where it has long been known as a domesticated animal, and whence in the middle ages it was introduced into Egypt, Greece, and Italy. It differs materially in its form and general aspect from the ox, being a heavier, more powerful, and more repulsive animal. Though lower in stature than the bull, the body is large, and more massive, and supported on short, thick, solid limbs. The hide is coarse and dense, and covered rather sparingly with long, black, wiry hair; the head is heavy, and carried with the muzzle projecting; the forehead is contracted, and convex; the chaffron straight; the muzzle large; the horns are compressed, and lie back, turning up laterally, and often attaining to a large size, but their direction does not allow the points to be used for goring; the ears are large, and somewhat pendulous; the dewlap is small; the eyes are wild, savage, and malicious; the tail is long, and slender. Fierce and sullen, the buffalo rushes desperately on its foe, strikes him down with the horns or forehead, kneels upon him, crushing in his chest, and then tramples on the lifeless body as if to satiate his vindictive fury. Its natural temper, indeed,

renders it difficult to tame, and difficult to manage, while its prodigious strength, and adaptation for certain localities, render it a valuable acquisition. The hot morass, teeming with pestilential miasma, is the genial abode of the buffalo, and its delight is to wallow in the stagnant water, where it will luxuriate, for hours, during the heat of the day, with its black muzzle just elevated above the surface: coarse aquatic plants are its favourite diet. Its flesh is hard and unsavoury, but the milk of the buffalo-cow is of peculiar richness; the hide is valuable from its toughness. Buffon seems to have entertained a great antipathy towards this useful but inelegant animal, the habits of which he describes to be altogether gross and brutal, and its flesh intolerable; neither will he allow the milk of the buffalo-cow to be equal to that of the ordinary cow, yet, according to the statement of Tavernier, whom he quotes, the quantity of cheese and butter procured from it in the East is very considerable.

According to the accounts of travellers, the buffalo exists in a tame as well as wild condition in many parts both of India and Africa, and, indeed, in Italy it may almost be said to have regained its natural freedom. Unlike the wild ox, as preserved in our parks, the wild buffalo can scarcely be called gregarious; small numbers may be seen in the same spot, or wallowing in the same quagmire, but they act independently of each other, and defend themselves with extraordinary resolution and vigour. It is only when pressed by hunger that the tiger dare venture on the combat, and then he is not always victorious.

Whether the buffalo, found wild in various parts of India, be descended from a race never subjugated by man, the original stock to which the tame herds may also be traced; or whether they are the de-



Tiger attacking a Buffalo.

scendants of a race once in slavery, but which at some time emancipated themselves, does not appear to be clearly settled. Probably the former is the case; for as the buffalo is stubborn, and managed with difficulty, preference would be given to the ox, and the period of its domestication would take place long before that of the savage and powerful buffalo would be attempted. The domestic buffalo, in fact, hardly looks like a reclaimed animal. The changes which domestication, sooner or later, effects on all animals, changes often so great as to render it difficult, if not impossible, to recognise any immediate affinity between the wild race and its enslaved relatives, the descendants of a stock time immemorial under the thralldom of man,—these changes, we say, are scarcely to be found in the buffalo,—everywhere its form, character, aspect, habits, and manners are the same. It may, perhaps, differ a little in size in different countries, and in the quantity of hair which covers it; but in these points wild animals offer as great a variation. Buffon observes that “the buffalo is more gentle and less ‘brutal’ in its native country, and that the hotter the climate the more docile its temper. In Egypt they are more tractable than in Italy, and in India more so than in Egypt. Those of Italy have more hair than those of Egypt, while in Egypt they have more than in India; their hairy covering, however, is never thick, because they are originally from a hot country, and, in general, the large animals of this kind of climate have no hair, or but a small quantity.”

With respect to the buffalo being very gentle in India and the adjacent regions, we are not quite sure that Buffon is right; at all events those who are acquainted with it there, say that it is sullen and revengeful.

Dillon observes that the buffalo at Malabar is

larger than the ox, with white eyes, and flat horns, often two feet long; its legs are thick and short—“it is an ugly animal, almost destitute of hair, goes slowly, but carries very heavy burdens. Herds may be seen, as of common cows, and they afford milk, which serves to make butter and cheese; their flesh is good though less delicate than that of the ox: the animal swims perfectly well and traverses the broadest rivers; besides the tame ones, there are wild buffaloes which are extremely dangerous, tearing men to pieces, or crushing them with a single blow of the head; they are less to be dreaded in the woods than elsewhere, because their horns often catch in the branches and give time for the persons pursued to escape by flight; the skin of these animals serves for an infinity of purposes; and even cruses are made of them for holding water or liquors: the animals on the coast of Malabar are almost all wild, and strangers are not prevented from hunting them for their flesh.” In Ceylon, as in Malabar, the buffalo exists both in a wild and domesticated state, and the tame herds are not unfrequently joined by wild individuals which the inhabitants sometimes entrap, and at other times shoot. Buffaloes, it would appear, are more common in Bombay than in Bengal. At Boitpoor, Bishop Heber was shewn a white buffalo, probably an albino, which was pointed out by the Indians as a rare curiosity. At Bombay buffaloes are very common: there, as elsewhere, their flesh is not much esteemed, and their milk is said to be poorer than that of the cow.

From India, the buffalo is distributed throughout Siam, Cochin-China, Malacca, and the adjacent islands, as Sumatra, Java, Borneo, &c., together with the Philippines; it is also common in China. Westward from India it has been carried into the Crimea,

Turkey, Greece, and Italy; in Africa it is very abundant along the Nile and in other districts, existing in a wild state, as well as in a state of domestication.

Dampier* informs us he found the buffalo common in the Philippine islands, and at Mindanao was daily fed on its flesh "drest very nastily."

"These cattle," says he, "are also in great plenty all over the East Indies, and therefore it is very probable that there were many of them here, even before the Spaniards came here." This was certainly the case, as they were aboriginals, which Dampier did not know.

At an island, which he calls the island of St. John, off the south coast of Canton, he saw the Chinese ploughing with buffaloes and treading out their rice with the same indocile animals. "They plough their land with a small plough drawn by one buffalo, and one man both holds the plough and drives the beast. When the rice is ripe and gathered in, they tread it out of the ear with buffaloes in a large round place made with a hard floor fit for that purpose, where they chain three or four of these beasts, *one at the tail of the other*, and driving them round in a ring, as in a horse-mill, they so order it that the buffaloes may tread upon it all."

He also saw the natives of some islands near to Formosa, commonly using the thick buffalo's hide as defensive armour, and as these islanders only fought with wooden lances seldom headed with iron, it is probable that this covering, "shaped like our carters' frocks, and as thick as a board," was a very efficient protection.

On reaching the bay of Bengal he found that the natives made great quantities of butter with buffaloes'

* Voyage round the World.

milk, which they sold in large earthen jars. He adds, "it is rank enough in these hot countries, though much esteemed by all the Chinese, who give a good price for it; and our English also use it."

The Chinese employ the buffalo as well as asses and mules in agriculture. Of the horse they make little use in the works of the field. During the winter they feed these useful animals with chaff and straw, and their chief support in summer is derived from the coarse grasses that grow in the ditches and the common reed that covers the swampy parts of the country.

They are made to perform the same useful offices in Cochin-China, where they are so docile that a woman or a girl can both guide the plough and drive the animal.* They are very abundant in that country, which, being intersected with numerous rivers and streams that create swamps, and well furnished with jungle or underwood, is exactly suited to their habits. The Cochin-Chinese also make the same use of the animal's hide that the Indians and Africans do of that of the rhinoceros.

When a recent American voyager had his audience of the governor of the city of Saigon, he observed that "files of soldiers with two-handed swords, and shields covered with indurated buffalo hides, highly varnished and studded with iron knobs, were drawn up in various parts of the hall."†

In Java and Sumatra, buffaloes are almost exclusively employed as beasts of draught and burden, though they always retain more or less of their natural ferocity: their flesh is also occasionally eaten by the poorer classes, though considered coarse and unhealthy.

* Voyage to Cochin-China, by John White, lieutenant in the United States navy.

† Id.

Mr. Marsden, in his valuable history of Sumatra, has given a minute description of the breed of buffaloes in that island.

The *Carbow*, or Sumatran buffalo, constitutes a main part of the food of those eastern islanders, and is the only animal they employ in their domestic labours.

The Malays and other people on the coast not only train them to draught but to the plough, as the Chinese and Cochin-Chinese do their buffaloes. The superior docility of the animal in these countries, is no doubt chiefly attributable to the treatment it receives and the patient character of its masters. Mr. Marsden says, "Though apparently of a dull, obstinate, capricious nature, the carbow acquires by habit a surprising docility, and is taught to lift the shafts of the cart with its horns, and place the yoke, which is fixed to those, across its neck; needing no farther harness than a breast-band, and a string which is made to pass through the cartilage of the nostrils. They are also, for the service of the Europeans, trained to carry burthens suspended from each side of a pack-saddle, in roads or paths where the use of carriages is impracticable. It is extremely slow, but steady in its work." It does not appear to be of so hardy a constitution as the domesticated buffalo of the South of Italy, for Mr. Marsden informs us that the least extraordinary fatigue, particularly during the heat of the day, is sufficient to put a period to its life, which is at all times precarious. It is subject to an epidemic distemper, for which no remedy has yet been discovered. The natives of Sumatra use neither milk nor butter, but the great part of those articles of food required by the Europeans there is supplied by the carbows, whose milk is richer than what is produced by the cow; though not in the same quantity.

The female carbow goes nine months with calf, and suckles during six, from four teats. When crossing a river it exhibits the singular sight of carrying its young one on its back. Its cry is weak and sharp—very unlike the lowing of oxen.

The carbows of Sumatra are of two sorts—the white and black. Both are employed in labour; but the natives will rarely eat the flesh of the white kind, saying that it is unhealthy and produces blotches all over the body. Mr. Marsden and others have indeed supposed that the whiteness is a disease in the animal itself, as is the case with the Albinos or white negroes. We may observe, however, on the authority of Captain Lyon, that there are white buffaloes also in Africa. Black, or a very dark hue, however, is the predominant, and seems almost to be the natural colour of this animal. Of the thousands of buffaloes, says a correspondent, which he observed in Italy, he never saw one of any other hue than coal black.

The carbow is said not to be properly a wild animal of Sumatra, though it abounds in every part of the island. This appears to be confirmed by the name of *carbow gellan* (stray buffaloes), which the natives give to such as are found in the woods. "Most probably," says Mr. Marsden, "they were at first wild, but were afterwards, from their use in labour and food, all caught and domesticated by degrees, or killed in the attempts to take them. When they now collect in the woods, they are said to be stray cattle; as the people of a conquered province, attempting to recover their natural liberties are styled rebels. They are gregarious and commonly found in numbers together, on which occasions they are much less dangerous to passengers, than when met with singly." Mr. Marsden also notices this animal's antipathy to a red colour.

The Sumatran buffalo has very little hair, except a bunch at the extremity of the tail; its hide appears to be almost naked. The tail does not descend lower than the middle joint of the leg. The horns, sometimes, but very rarely, point forward; they are always in the plane of the forehead, resembling in this respect all other buffaloes, and differing from every other kind of cattle. These horns, except at the points, are rather square than round; from the quantity of solid substance they contain, they are valuable in manufacture. The buffalo, as we have stated, is also domesticated in the Crimea, where it is extensively employed by the Tartars as a beast of draught, but from the peculiarities of that climate, which is subject to severe cold as well as heat, the animal seems even more difficult to manage than in Italy.

The Arabs of Howash, like all the tribes of the Ghab, rear very large herds of buffaloes, which are smaller in size and less spirited than the usual breeds.

It is a curious fact, remarked by Burchardt,* that though the Turks consume and even highly esteem both the flesh and the sour milk of the buffalo, they hold it, like the wild boar, as an unclean and accursed animal. The reasons assigned for this are, that the buffalo, like the hog, delights to wallow in the mire, and *that all the animal kingdom was converted by Mahomet to the true faith, except the buffalo and the wild boar, which pertinaciously remained unbelievers!*

The Rhyanlu Turkomans, a nomade tribe that take up their winter quarters in the plain of Antioch in September, and depart thence for Armenia about the middle of April, when the flies of the low coun-

* 'Travels in Syria,' p. 135.

tries begin to torment their cattle and horses, buy up buffaloes and Arab camels, which they barter in Armenia for a better breed of camels, and some other cattle, that on their next annual migration they bring for sale to the market of Aleppo.

Captain Lyon, in his 'Travels in Northern Africa,' describes three species of buffaloes, which are found in immense numbers in the mountains of Wadan. These are, first, the wadan, from which the mountain is named; an animal about the size of an ass, with very large head and horns, short reddish hide, and large bunches of hair hanging from each shoulder to the length of eighteen inches or two feet; of a very fierce disposition. Second, the bogra el weish, which is about the size of a cow, red in colour, slow in its motions, and carrying large horns. Third, the white buffalo, which is lighter in make, and more active in its motions than the preceding species; but so shy and swift that it is not easily procured. These animals calve in April or May. With the white variety noticed in Sumatra by Marsden, and with this alluded to by Captain Lyon, naturalists do not appear to be acquainted.

In Abyssinia, and more particularly in the forests of Ras el Fil, the buffalo is very common. Its skin is chiefly employed in that country for the making of shields, in which considerable art is displayed. Bruce states it to be plentiful in the neighbourhood of Tcherkin.

The only parts of Europe where the buffalo is largely employed as a beast of burden, and in the yoke, are Italy and Spain.

The following original communication, on the habits, manners, and general treatment of this animal as it exists at the present day in Italy, is so interesting that we have great pleasure in presenting it entire to our readers. It is the result of personal

experience, and on that account alone would be valuable, independent of its conveying so full an account as to require nothing to be added to it.

“Buffaloes were introduced from Africa to Europe during the middle ages, and in course of time were thoroughly naturalised and greatly multiplied in Spain and Italy, to which countries of our continent they are still almost confined.

“More than one of the old Italian chroniclers who wrote when the animal was still a rarity, describe it as a wild ox from Pagan lands, and speak with something like horror of its fierce disposition, its tremendous strength, its fatal horns, red eyes, and thick fuliginous body. And indeed, confronted with the quiet milk-white or fawn-coloured steers of Italy, the buffalo is somewhat diabolical both in disposition and appearance. It was soon, however, ascertained that the buffalo was a very valuable animal that could flourish and increase in the congenial climates of the south without requiring much attention from man. Wherever there were unhealthy marshes unfit for almost every other purpose, or stagnant pools and damp underwoods, there these African herds would thrive in perfection. Unfortunately the wars that produced and followed the fall of the Roman empire, by removing an intelligent and industrious population, left throughout the Italian peninsula vast and numerous tracts of this sort, where, from want of draining, from the exuberance of vegetation, and from that rapidity with which Nature will everywhere make a wilderness and a desolation, when man is withdrawn from the struggle with her, the country became insalubrious, swampy, and wild in the extreme. In these tracts the buffaloes were turned loose, and left to range almost in a state of nature, acknowledging a doubtful allegiance to a few miserable peasants, who con-

trived to milk the cows and now and then to take away a buffalo calf, in either of which operations their lives were often put in jeopardy by the savage character of the species. In several places they multiplied so rapidly, and so completely enfranchised themselves from the control of man, that it became necessary to hunt them like wild cattle.

“The face of Italy has been wonderfully improved since the middle ages, and there are now many districts, where the buffalo, much tamed in his disposition, is bred, that have long ceased to be pestilential swamps; but still the stations where he most flourishes, and which are best suited to his habits, are such as have been described, and in them he may be said still to be almost in a savage state. Wherever large herds of buffaloes occur, they may be taken as the sure index of *malaria*. In the wild provinces of the Calabrias, where most of the plains and valleys are always partially swamped by the Laino, the Chratis, the Amato, and numerous other rivers and torrents, they are very common; they range, almost the only occupants, over the plains of Paestum, and the still wilder and more extensive flats of Apulia. The Pontine marshes offer them a favourite retreat, and in the pestilential Maremma, both of Rome and Tuscany, scarcely any other animals, except wild boars, are ever seen. In northern Italy, where there is infinitely less malaria than in the south, they occur in greatest numbers where the causes of that pest exist, and where its effects are often felt, in the inundated rice grounds of Lombardy, in the marshes formed by the overflowing of the Po, the Tanaro, the Ticino, or of some other rivers or lakes.

“The writer of this communication has had frequent opportunities of observing buffaloes in all the places mentioned, and in many others not necessary to

enumerate. Their habits seem to be the same everywhere, and to differ little from what they are in their wild state.

“The chief delight of their lives, during the heat of summer, seems to be to wallow in water or mud. After they have well rolled themselves they will often remain imbedded for hours without moving, leaving little more than their black snouts visible above water. If disturbed in this enjoyment they are very apt to become sulky and dangerous. They must find nourishment in aquatic and other plants not suited to cows, for they will not only exist but thrive where half the same number of cows would be half starved. They are subject, however, to rapid decline and mortality in case of the failure of water and mud to wallow in. During the writer’s residence in the country, part of the province of Apulia was visited by a dreadful drought; insufficient supplies of water were brought from great distances, and in many places the farmers were obliged to eke it out by mixing wine (of which they had a plenty at a very low price) with it. With this beverage they contrived to prevent any great mortality among the rest of their cattle, but they were far from being so successful with the buffaloes. The pools and wallowing places of these animals were not merely dried up—they were literally baked like bricks—and without these resources, essential to the animal’s existence, not even wine and water could keep them alive.” Before the regular autumnal rains came to the succour of that African-like country, great numbers of them had perished. Woods and thickets, or at least plenty of brushwood or reeds, seem to be, if not altogether so essential, greatly conducive to the animal’s comfort. In the Maremme and in the plain of Pæstum, they are constantly seen to retire to dense thickets, at certain times of the

day, after they have wallowed in the mire.' The wild buffaloes of South Africa can scarcely surpass them in the facility with which they force their way through an entangled wood.

"The thickets on the Pæstan plain are chiefly composed of gigantic myrtles, frequently rising ten or twelve feet, and of other evergreens. They are called in the dialect of the country 'macchioni,' and sometimes the only paths across the desert run through them. Here the traveller is liable to be startled by hearing of a sudden a savage noise, between a snort and a grunt, or to see close to him, the black fierce-looking head of a buffalo, with its blood-shot eyes, peeping through or over the thick shrubs, and turning up his nose as if in scorn. The expression is habitual to and very characteristic of the buffalo. He does not carry his head quietly and modestly like the ox, but thrusts it forward, bringing the facial line nearly horizontal with the neck, and carrying his snout upwards like a wild boar. Though the brute can scarcely be supposed to have such a sentiment as contempt, he certainly exhibits what we look upon as a manifestation of it, turning up his nose at every thing.

"The sudden sight of these powerful and ill-tempered animals in the solitary macchioni, is certainly rather startling; but except at particular seasons, or at loud noises, or attempts to scare them away, or the exhibition of some glaring colour, no attack from them is to be apprehended, though from the treacherous-like manner in which they skulk close to you, it seems every moment imminent. A German artist, who went to sketch the magnificent remains of the neighbouring temples, incurred considerable risk by pulling out a red bandana pocket-handkerchief, and the writer himself had once a narrow escape in attempting, after the fashion of the

buffalari, on horseback with a long spear or goad in his hand, to drive some half dozen of them from one place to another. Their charge, in which they bring their muzzles under and close to the ground, and bring their thick horns upwards, has a very formidable appearance.

“Here, and in every other part of Italy where they are bred, buffaloes are much used as beasts of burden. Their prodigious strength renders them available in many emergencies when the oxen of the country, though large and powerful, entirely fail. An Italian officer has favoured us with the following details from his own observations in the States of Parma and Piacenza.

“During the building of the new theatre at Parma by Maria Louisa, (Buonaparte's widow) I have seen six, and I believe sometimes eight, buffaloes, transport one by one the immense columns of the façade, which are all of one piece of marble, and of a weight that you may conceive from their size and material. This they did with such ease as surprised every body, while I am convinced from experience that twenty-four of our best oxen would not have been able to move one of the columns. These marble columns were brought as near as Sacca on the river Po, by water, but from Sacca to Parma is a distance of more than twelve miles, and this the buffaloes performed in one stage without stopping.

“As to the passage of the bridge on the Taro where I witnessed another extraordinary proof of the strength of these animals, the fact was simply this. Marshal B—— had been on business at Parma, and was in a great hurry to return to Milan; I was charged by Maria Louisa to attend him as an escort of honour, as far as Piacenza. We set out in horrible weather, and it had rained the whole of the preceding night and day. •On arriving at the Taro

we found that torrent in a fearful state, nor was it possible to pass it except by the new bridge which was not yet finished. Nobody had yet passed it, and the approaches to it on either side (the bridge being built very high) were not only steep, but composed of deep, loose earth, which had not been beaten or secured. It was determined, however, that we should attempt the ascent; but scarcely had we got a third of the way up, when the carriage sank in the mud to the axles of the wheels, and stuck fast, in spite of the efforts of four excellent post-horses, and two pair of oxen put to, to assist them. After toiling for an hour, the thought came into my head to try buffaloes, of which I saw some on the opposite side of the torrent. Only one pair was brought over to us, and the oxen being removed, these animals were put to, in front of the foremost pair of horses. Although the horses were almost exhausted by the labour they had undergone, and one of them, frightened at the unusual company of the buffaloes, offered resistance rather than assistance, yet this single pair of robust animals, snorting and blowing a little at first, moved the carriage and dragged it upon the bridge. While thus ploughing with the carriage, axle-tree deep, they were themselves nearly up to the chest in mud. B——— could scarcely credit the evidence of his senses. When we were about half way over the bridge, the peasants who had gathered round the carriage to lend a hand, or to obtain a present, making a little confusion, and as usual with them, a great deal of noise, one of the buffaloes took fright and became unmanageable—and thus exposed not only the Marshal, carriage, horses and postilions, but your humble servant, the escort of honour, to the hazard of being drowned in the roaring torrent below, for our new bridge had neither parapets nor any kind of protection at its sides.

Having caused the peasants to make a retrograde movement, and hold their tongues, we waited the event. The restive buffalo, on finding itself alone with its master or conductor, who then ventured to approach and caress it, immediately became quiet, and, with his companion, dragged the Marshal's carriage safely over the bridge. We had then to pass my own carriage, and this was done with equal ease by the same pair of buffaloes. In campaigns I have served in, how many pieces of artillery we were obliged to abandon, might have been saved by means of buffaloes!"

In the south of Italy, where they are infinitely more numerous than in the provinces to which our friend refers, buffaloes are always used when great strength is required. In many parts of the kingdom of Naples they are quite as common, as beasts of draught, as oxen, and much more common than horses. An Englishman, looking only at his own country, with roads level as bowling-greens in all directions, and with breeds of horses suited to every variety of work, will hardly understand this—but in the countries of which we speak, the roads, except a few of the principal ones, are very bad, the horses though spirited are undersized, and the carts and waggons in general are preposterously huge and heavy, and of the very worst construction. Mules that do not draw, but carry their burdens on their backs, are very generally employed—they are also harnessed to "vetture" or stage coaches, but there is much work which they could not perform.

In some of the marshy plains of Calabria, in particular, communication would be almost impracticable were it not for the buffalo. There are not only morasses, swamps, and bogs in every direction, but rivers suddenly swollen to torrents in rainy weather, and unprovided with bridges of any sort, frequently

occur. Horses, mules and oxen would inevitably stick fast in such tracts as these; but a pair of good buffaloes working chest deep in the mud, will, slowly indeed, but surely, drag a large *carro* with its goods or passengers through them. To pass the rivers, the inhabitants harness the buffaloes to high carts, with wheels of prodigious diameter, so that the platform of the vehicle is considerably above the buffaloes' heads. The animals, from their natural habits, take readily to the water, and provided it does not entirely cover them, they will drag the cart to the opposite bank. The writer of these pages has seen feats of this sort that excited his astonishment. In one instance on crossing a broad, muddy, sluggish stream, the buffaloes suddenly sank entirely below water which began to ooze into the awkward vehicle,—the driver roared out with all his might, and with a tremendous effort the animals moved the cart forward, and got to shoaler water, or a harder bottom; but even then, little more than their black snouts, through which they blew violently, appeared above the surface of the stream. After allowing them a little breathing time, the driver set up another shout or roar, and struck them with a long goad he held in his hand. At this warning they renewed their efforts, and snorting and blowing, and throwing up the water (in which, and in mud, they were almost buried the whole way), at last reached terra firma, if a quagmire might be so called.

“On the great plain of Apulia, their services are almost equally valuable. On the edges of that pastoral desert a great quantity of corn is grown, the marts of which are the towns of Foggia, Manfredonia and Barletta. To reach those places it is generally necessary to cross more or less of the wide plain, where there can scarcely be said to be any road, every muleteer, waggoner, or traveller shaping his

course as he chooses across the desolate flat, much in the same manner as the Arabs do in the Syrtis or other deserts. In some parts of this plain there are tracts of loose, deep sand, and in others, pantani, or swamps, which, in rainy seasons, are deeply covered with water.

“Now the mules, so much used, and so excellent in the steep, rocky mountainous parts of the country, do not like either the sand, or the swamp, and, to say nothing of the casualties to which they are exposed, it would take a large string of mules to carry on their backs half the quantity of corn that a pair of buffaloes will draw in a waggon.

“There are few better places for observing the labours and habits of buffaloes than the great town of Foggia, which rises like an island in the Apulian flat. There they are seen to arrive in all directions, slowly toiling over the plain, with their cumbrous waggons behind them, and their drivers walking at their heads. In summer the heats are intolerable, and the shade of a single tree is not to be found,—the plain, in some parts, swarms with gad-flies and other insects, that drive mules, horses, and even the quiet oxen almost mad; in winter the expanse, open on one side to the stormy Adriatic, is frequently swept by tremendous hurricanes, and when it rains it rains almost as it does between the tropics. Yet in all seasons the buffaloes, exempted from some of the evils to which other animals are exposed by the extraordinary strength of their constitution, and from others by the thickness and toughness of their skin, will perform their useful labours.

“It is a curious though rather a melancholy sight to meet on the plain, yoke after yoke of these dingy, red-eyed animals, whose appearance is always most gloomy and sulky, and whose pace is as measured as that of the camel. As they arrive at the entrances

into the town, the cars halt in a long caravan-like line, and the buffaloes are unyoked, and provided with some water and coarse provender. If not immediately liberated by their drivers they throw themselves on the ground in a fury. In places where stagnant water is at hand, it is almost impossible to prevent them from rushing to it; but at Foggia there is nothing of the sort, and indeed water of any kind is at times rather scarce. Those drivers who are careful of their animals, generally contrive, however, to throw a little water over their flanks, or on the ground where they are about to lie down. A bundle of the broad leaves and stalks of the Indian corn well moistened in water, seems to give them peculiar satisfaction when placed under them. Like the camel, after their day's toil, they, for the most part, pass the night in the open air, requiring no care from man. A stranger, however, should take care not to get involved among them on a dark night, as when disturbed they are not so patient as the good-natured camels under the same circumstances. These animals, indeed, are often known to attack their own driver and the man who feeds them, and dreadful accidents are by no means uncommon in the districts where they are much in use. They are generally described by those most familiar with them, as being stupidly malignant and ferocious, and altogether incapable of that feeling which attaches other animals to kind masters. It is evident, however, that even their enormous strength is often over-taxed; that they are over-worked, and cruelly treated. In one instance that fell under the writer's observation, in which the rage of a buffalo proved fatal to a human life, it appeared that the animal could very well draw a distinction between good treatment and bad. This animal was driven to Foggia by a man who had often driven him before without accident—the day

was a very bad one, and parts of the plain they crossed were in a sad state from recent rains. The driver, impatient to reach the town, would proceed without allowing the animals sufficient rest. It was seen by other drivers, going the same route, that the heavily-laden cart frequently stuck deep in the mud, and that the man cruelly goaded his yoke of buffaloes to make them drag on. As he at last reached his usual halting place at the edge of the town, he unyoked, when no sooner did one of the buffaloes feel himself at liberty than he rushed at the man, knocked him down with a blow of his head, and then savagely threw himself on his knees upon the prostrate body. There were several spectators close at hand, and among them some bold and experienced buffalodivers; but before they could secure the infuriated animal, he had so kneaded the victim of his revenge that the blood gushed from his mouth, nose, and ears, and he was dead.

“At the great fair held at Foggia, at the end of May and beginning of June, immense droves of almost wild buffaloes, presenting when thus condensed, a most formidable appearance, are brought to the town for sale. They are collected in the tenue or cattle farms, or in the wildernesses where they have hitherto roamed, and driven to the fair by buffalari, all well-mounted, and furnished, each with a long goad, not unlike a Cossack's spear. These men, who come from various parts of the kingdom, are almost as wild-looking as the cattle they conduct. They are excellent horsemen, very expert in the use of their goad or lance, and long *couteau de chasse*, which (generally accompanied by a large pistol) they always carry upon their persons. Indeed they not only look a warlike band, but might prove such, and be employed as excellent light troops without any addition to their ordinary equipment.

The mass of the Cossacks in the last war were neither so well armed nor so well mounted as these cattle-drivers.

“ During the fair of Foggia, the buffaloes are enclosed in a large square, in which, from their great numbers, they are often much crowded. Every buffalo, and at every season, smells more or less of musk; but from the heat, crowd, and their multitudes here, this part of the fair is more strongly perfumed with musk than ever was a London drawing-room, even when that noxious odour was most in fashion. To enter into this almost ‘solid square’ of ferocious animals, as it is necessary for purchasers to do, seems rather a nervous task to a stranger. The buffalari make way with their spears, and shout and whistle to their respective herds in a peculiar manner. Accidents, however, are not uncommon. Sometimes a buffalo, becoming furious, breaks away from the square, runs madly through the town, and as the streets are crowded at that season, he is almost sure to do some mischief. The cry of ‘Buffalo scappato’ is indeed a cry of terror. On level ground the speed of the animal is very considerable, but he labours under a disadvantage in descending a hill, as his fore legs are shorter than his hind legs. He also runs with blind fury, straight forward, and may be turned and dodged with success. Still, however, everybody in Apulia and the other places where these animals abound, allow that they are very much to be dreaded when in a state of irritation. They follow their victim with great pertinacity, and if they reach him they throw him down, kneel on him, and, it is said, never leave the body until they hear that respiration has ceased. From the manner in which their horns are turned back, they can rarely make any use of their points.

“ Two friends of the writer, an English gentleman

- and an Italian, whilst traversing on foot a lonely part of the Campagna of Rome, were suddenly set upon by some buffaloes, and narrowly escaped by creeping under the low arch of a bridge that crossed a ditch, in which uncomfortable place they were obliged to remain a considerable time, until the brutes chose to depart.

“ In the kingdom of Naples they sometimes make sport with the buffalo by bating him, and assailing him in different manners, but this pastime is much more prevalent in another part of Italy.”*

Although lions, tigers, bears, elephants, rhinoceroses and other stupendous wild animals, collected from all parts of the world, are no longer exhibited as in the days of the empire, modern Rome has still its amphitheatre and games. These are less magnificent, indeed, but also infinitely less cruel than of old. The combatants are bulls and buffaloes, which are baited by men or by dogs for the entertainment of the Roman people who seem as fond of *circenses* as were their great predecessors. The scene of the modern sport, which is called *La giostra*, is, like so many other places in Rome, a curious compound of the modern and the ancient. The “ Anfiteatro Correa,” as the place is designated in Italian, we believe from the name of its owner or manager, is situated in the massive cluster of building raised upon the site, and partly with the materials, of the mausoleum of the Emperor Augustus in the Campus Martius. The walls of this amphitheatre, the *podium*, and the seats, are all of modern structure. The dimensions

* One of the Neapolitan games is amusing enough. A buffaloro well mounted, and whose horse is trained to turn short on his haunches, and to be perfectly “ in hand,” undoes the long scarlet sash he wears round his waist, and shaking it in the air provokes the animal to pursue him. This is interesting as a specimen of *manège* and horsemanship.

though small when compared with those of the Colosseum or Flavian amphitheatre of ancient Rome, are yet sufficiently spacious. The arena occupies the platform of the ancient mausoleum, which in other times was cultivated with flowers and rare shrubs, while the pyramid that bore the statue of Octavius rose in the midst. The vaults beneath these arenas, which once held the imperial ashes of the Cæsars, are now, in part, used as dens for the wild cattle that are brought in from the Campagna and other places to be baited. These exhibitions take place in the summer months, generally twice a week. They begin about five o'clock in the afternoon, and last till dusk. Admission is not allowed gratis, as in old times. For a good seat, as much as two paoli (about twelve pence of our money) are paid at the door.

The giostratori, or men who are to encounter the animals, dressed in white jackets and trousers with a red sash round the waist, and each bearing a short staff with a small red flag at its end like the pennon of our lancers, muster in the arena and make their bows to the assembled spectators. Among the giostratori are generally some two or three who have a high reputation for skill—these are for the most part vaccari or herdsmen—men brought up from their childhood among the cattle that graze on the wide solitudes of the Campagna, and who are consequently familiarised with the habits of those animals. The giostratori from Viterbo have the reputation of being the most skilful, and Il Viterbese, (the Viterbo man) is an ordinary appellation of the best bull-fighter of the day.

In the midst of the arena there is a pole fixed in a strong stone pedestal, by dodging round which, a man can, for a time, baffle the pursuit of a bull or a buffalo. At a given signal a door is opened in the arena, and the bull rushes out generally at the top



Bull of the Campagna of Rome.

of his speed, until arriving in the midst of the open space he looks up at the multitude above him. The giostratori now attract his attention,—he paws the ground, roars, lashes his tail, and presently springs at one of them. The individual singled out turns nimbly aside to avoid the charge, and one of his comrades endeavours to distract the bull's attention by drawing it on himself. It often happens that one of the giostratori is pursued round the arena; in which case, if hard pressed, he catches hold of one of the iron rings that are placed at certain distances round the wall of the podium or cincture which encloses the arena, and giving at once a spring, and pulling by the arm, reaches the parapet or terrace, which runs round at the foot of the lower seats of the amphitheatre. The wall to be thus

cleared is six or seven feet high. Great quickness and agility are required for this feat, and to avoid being pinned to the wall by the infuriated animal. Accidents sometimes happen, but very rarely, as when one of the giostratori is in danger, the others run to his rescue, and draw the attention of the bull in another direction. When the bull has been worried for a time and begins to be tired, the gate leading to his den is thrown open, upon which he almost invariably retires of his own accord, though occasionally it is necessary to drive him from the arena.

Another door is then unclosed, and a buffalo throws himself headlong into the scene of action. The appearance of this animal, though far less noble than that of the Toro Vaccino, is more ferocious.

The buffalo is not often encountered by those who have baited the bull, or the vaccari, but by men who have lived among buffalo herds, and who are called buffalari. The latter individuals are chiefly from the marshy grounds of Maccarese and Ostia, near the mouths of the Tiber, and from the Isola Sacra, or holy island, which lies between the two branches of that celebrated river. Many of these buffalo keepers used to be men whose crimes drove them from society, and who, escaping from the hands of justice took refuge in those pestilential flats, where the great land-owners were but too happy to grant them protection, as few, except men in their desperate circumstances, could be induced to make a permanent residence in such places, or to charge themselves with the buffalo herds all the year round. As long as they abstained from the commission of fresh offences and remained quiet they were undisturbed, though not forgotten by the Roman *sbirri*, or police, who, only on very particular

occasions, would pass the frontier line of their wilderness. Many of these buffalari acquire a wonderful command over the stubborn ferocious animal, and an acquaintance with every turn of its disposition.

The buffalo, when within the arena of the amphitheatre runs at his opponent in a much more desperate manner than the bull; missing his agile tormentor, he often knocks his head furiously against the wall, out of which he sometimes makes splinters of stone fly in all directions, and this apparently without hurting himself, proving the wonderful hardness of his skull. The horns, in their natural position being turned backwards from the head, are not exposed in this battering.

The buffalari play various tricks with the animal. Sometimes one man will draw the buffalo upon him, and all at once, when it is in mad career, by stopping right in its way in a peculiar attitude, and by uttering a peculiar sound, half cry, half whistle, such as is probably used by the keepers on certain occasions in the Maremme and the Campagna, will bring the animal to a dead stop, and enchant it, as it were, fixed and motionless at only a yard's distance from him. This is a moment of breathless anxiety for the spectators. The man's destruction seems inevitable, but the charm has seldom been known to fail.

There is another sport which is called "*La botta.*" This is very amusing. A large tube, made of wicker work, or other flexible materials, well wadded within and without, and open at both ends, looking in short like a cask or butt (whence its name) with the ends stove in, is rolled across the arena. Presently a man creeps into this botta, and then lifting it up on end, rises on his feet and begins to move, with his head peeping above the cask, towards the

buffalo, who at first stares bewildered at the sight, and then runs and upsets the novel object. In this game the man must be careful, when the charge is made, to draw in his head and legs, and keep himself entirely covered like a tortoise in his shell. The buffalo seeing that the *botta* no longer moves, kicks it, butts at it for awhile, causing it to roll along and



La botta.

then leaves it; but presently the cask is again raised on end, and moved by the man towards the beast. This trick could not be played with the *Toro Vaccino*, whose sharp and strong horns, better placed for attack than the buffalo's, would pierce the cask through and through.

In this manner, and in the performance of some other tricks, a buffalo succeeds a bull, and a bull again succeeds a buffalo, and so on alternately, sometimes to the number of a dozen animals in an afternoon. But they are not all of the same strength and spirit,—some are sorry, jaded beasts, which the impatient spectators soon hiss out of the arena. Generally speaking two or three are the wonders of the day; and certainly finer specimens of

the bull, whether for beauty of form, strength, or fierceness, than those exhibited now and then at this Roman amphitheatre, are not to be seen in any country. Some of them, like the English blood-horse, have a name and genealogy, and come off the celebrated *tenuta*, or cattle farm, of some nobleman or great landed proprietor; all of which particulars are specified in the printed bills that are stuck up and distributed at the door of the amphitheatre.

These modern Circenses are, as we have already observed, conducted with much greater humanity than those that were the delight of ancient Rome. They are also far less sanguinary than the bull-fights of Spain; for neither bull nor buffalo is killed, and great precautions are taken to secure the lives of the men against accident. Indeed the police, always in attendance, are particular in impressing on them the obligation of avoiding as much as possible any shocking catastrophe. It is, therefore, chiefly a display of agility, and is interesting, in part, as showing the habits of the animals, and the superiority of human sagacity over brutal force and instinct.

The greatest cruelty is that attending the baiting by dogs, which are sometimes set upon the animals, though rarely on any but such as are destined for the slaughter-house the next day. The fiercest of these dogs are of the Corsican breed, and as distinguished for what Lord Byron called "tenacity of tooth," as our English bull-dog, to which they are not unlike, though still larger in the head, and more savage in appearance and disposition. They usually pin the animal by the ear, or under-lip,—but they themselves are often the greatest sufferers, being tossed in the air, and ripped up by the horns of the bull.

The unpleasantness of this is increased by seeing

females, and not all of low degree, looking on the unseemly sight. This is calculated to recall the worst features of the ancient Roman character, as displayed in their amphitheatres, where cruelty and lust formed an abominable junction.

However much more humanely these matters may be managed in Christian Rome, still women ought not to attend fierce games like these. The last beast introduced on the arena, almost always a buffalo, is tormented in another way.—A number of squibs and rockets are fixed on his shaggy skin, and then set on fire. The poor animal runs about, maddened by the noise and smoke—he is also at times scorched, though, owing to the great hardness and thickness of his hide, never very severely. This is the *finale* of the exhibition. The buffalo is then let into his den; the Vaccari and Buffalari muster once more in line in the centre of the arena, and make their bows to the spectators, who answer by applauses or hisses, according to circumstances. And thus, before the church bells of Rome toll the “Ave-Maria,” the exhibition closes.

Both in the Roman and the Neapolitan states a most extensive use is made of buffalo's milk, which is much more rich and creamy than that of their cows. Besides a great variety of cheeses, this milk is the material of almost numberless preparations, some of which are to be eaten fresh, and others can be kept all the year round. The “provola,” the “fior di latte,” the fresh “caccia cavallo,” the “pure Romano,” and several others of these are truly delicious. From the coarseness of its flesh, and from the habits of the animal, one would scarcely expect anything so delicate to proceed from it. In these parts of Italy the tenants are accustomed at Easter, Christmas, and other festive seasons, to make presents to their landlords. In these little offerings some of the preparations of buffalo's milk are always included.

After observing, as we have had opportunities of doing, the many different ways in which not only the Italians, but the Turks and other people, prepare the milk of buffaloes, cows, goats, and sheep, and the infinite variety they thus produce in a simple and most wholesome article of food, we have always been struck with the idea that our English dairy is very deficient. The Turks have upwards of fifty different preparations from cow's milk alone. Of one of these preparations, called *yaourt*, they have so high an opinion, that they rank it as a celestial invention, saying that the patriarch Abraham was taught how to make it by an angel, or, with a still prettier fiction, they assert that a winged messenger from heaven presented a pot of it (the first seen on earth) to Hagar, as she was fainting in the wilderness.

The flesh of the buffalo is eaten in the Roman and Neapolitan states by the poorer classes. In the city of Rome the sale is almost confined to the poor Jews. Unless killed when quite young this meat is hard, black, very coarse-grained, and tough. The hides, horns, and hoofs are converted to many useful purposes, and are articles of exportation.

It will thus appear to the reader that the buffalo is a very valuable, though a very troublesome animal. At Rome, as at Foggia, a "buffalo scappato" will sometimes alarm one half of the city.

It is a curious fact that these animals, which are so numerous and so useful in Calabria, have never been introduced into the neighbouring island of Sicily, where the same circumstances of soil and climate would favour their increase, and where their services as beasts of draught would be equally valuable. Closely allied to the buffalo is an animal which inhabits the high lands of Indostan, described under the name of *Arnee* (*Bos Arni*, Shaw). Desmarest, Cuvier, and others, indeed regard it as a variety of

the wild Indian buffalo, but it is doubtless a distinct species: its horns, which sweep outwards and upwards, and converge at the points (the pair completing more or less of a circle), are of enormous length, and convey the idea of an animal of prodigious power. The skull with the huge horns attached are not uncommon in museums, but no specimen of the animal itself exists in Europe. It is said to be very bold and savage, but we know little of its peculiar habits.



[Skull and Horns of Arnee.]

We have previously observed, that the Cape buffalo (*Box Caffer*, Sparm.) is totally distinct from the Indian

[*Bos Caffer*.—Cape Buffalo.]

species; it is peculiar to Southern Africa, and is wild, ferocious, and when old, untameable. Sparmann gives a tolerable figure of it in his 'Voyage, &c.,' vol. ii., and an excellent description: his figure is the original of most that have since appeared in works on natural history.

The ravines and gorges among the hills are the localities chiefly frequented by this powerful animal; especially if affording water, for like the common buffalo, it is extremely fond of wallowing in pools or marshes, where it passes the greater part of the day. The expression of the countenance is peculiarly malicious, an effect to which the position of the horns overshadowing its fiery eyes not a little contributes. These formidable weapons form at their base a solid rugged mass, covering the forehead, from which they bend downwards and somewhat outwards, gradually diminishing to the points which suddenly curve

upwards. The distance between the points of the horns is frequently five feet; but the urgoose massive base of each is in contact, constituting an impenetrable helmet. Their colour is black. The ears are a foot in length, pendant and in a great measure defended by the horns, yet it is observed that they are always torn and jagged. Sparmann noticed this fact, and observes that "the edges of the ears are notched and shrivelled up in divers ways, which probably proceeds from the wounds these creatures frequently receive in their battles with each other, and from the rents they get in the briars and almost impenetrable thickets through which they pass, together with other casualties of that nature; though several Hottentots have been induced from thence to imagine that the buffaloes belonged to certain supernatural beings who marked the animals in this manner for their own cattle." Burchell also refers to the circumstance of the ears of these animals being torn, attributing it to the cause conjectured by Sparmann, and farther informs us that the assurance of the Hottentots that individuals with entire ears are rarely seen, coincides with his own observations. Though not taller than an ordinary ox, the Cape buffalo is a far stouter, heavier, and more powerful animal. Its limbs are short and thick, its body bulky, and its head ponderous: the admeasurements of a male killed by some of the party with Sparmann are as follow—"Length, 8 feet; the height, $5\frac{1}{2}$; the fore-legs, $2\frac{1}{2}$ feet long; the larger hoofs were 5 inches over; from the tip of the muzzle to the horns was 22 inches."

"The hide is dense and tough, and sparingly covered with harsh blackish hairs, that on the under lip and about the corners of the mouth being elongated so as to form a scanty beard. The hairs of the buffalo, says Sparmann, are of a dark brown colour,

about an inch long, harsh, and on such males as are advanced in years very thin, especially on the middle of the sides of the belly; whence they appear at some distance as if they were girt with a belt; and what contributes not a little to this appearance is that the buffaloes in general are very fond of rolling in the mire. The hairs on the knees are in most buffaloes somewhat longer than those on the rest of the body, and lie as it were in whorls. The eyes are somewhat sunk within their prominent orbits. This, together with the near situation of them to the bases of the horns, which hang somewhat over its pendant dangling ears, and its usual method of holding its head inclined to one side, gives the buffalo a fierce and treacherous aspect. The disposition likewise of the animal seems to correspond with its countenance. He may in some sort be called treacherous, as he is wont to hide himself among the trees, and stand there skulking till somebody happens to come very near him, when he rushes out at once into the road, and sometimes attacks them. This animal likewise deserves the appellation of fierce and cruel, as it has been remarked, that not content with throwing down and killing the person whom he attacks, he stands over him afterwards in order to trample upon him with his hoofs and heels, at the same time crushing him with his knees, and with his horns and *teeth* (?) tearing to pieces, and mangling the whole body, and stripping off the skin, *by licking it with his tongue* (?). This however he does not do all at once, but at intervals, going away between whiles to some distance off. Notwithstanding all this, the buffalo will bear to be hunted; though sometimes he will turn and hunt his pursuer, whose only dependence in that case is upon the swiftness of his steed." Burchell confirms the account of the danger of the chase of this animal without the means of escape at hand. The balls

used in this sport should be alloyed with tin, and large Sparmann, speaking of a buffalo which one of his men had shot, observes that "the ball had hit the lower part of the neck and entered the lungs, where, though it did not seem to have struck against any bone, and though it was alloyed with the usual quantity of tin, it was yet found to be pretty much flattened. In other buffaloes that we shot since, I have sometimes found the balls, though alloyed with tin, shivered into pieces against the bones in the internal parts, or at least very much flattened. It is not therefore worth while to set about shooting the buffalo with balls made of lead only, for they will seldom be able to penetrate into those parts where they are likely to prove mortal. Besides being possessed of the degree of hardness requisite, a ball should be of a tolerable size to kill so large an animal as a buffalo. The least that ought to be used for this purpose should weigh two ounces and a quarter."

Notwithstanding the risk necessarily attendant upon the chase of this animal, and the accidents that frequently happen, the Caffres are accustomed to attack the buffalo, and often successfully, though armed only with assagais, or javelins, which, however, it must be observed, they throw with great force.

They set out on these hunts under the command of a chief or captain, and spread in different directions over the country. When a Caffre discovers a spot where several buffaloes are assembled, he blows a pipe made of the thigh-bone of a sheep, which is shrill, and heard at a great distance. As soon as his comrades hear this, they run to the spot, form a circle round the animals, which they contract by degrees, and when sufficiently near throw their assagais with unerring aim. Out of eight or twelve buffaloes which are generally found together, they

are pretty sure to kill some. It sometimes, however, happens that the buffaloes, in breaking furiously through the circle, kill some of the Caffres.

The Hottentots in the service of the Dutch and other farmers, attack the wild animal with infinitely more advantage, for they are not only trained to the business, but provided with fire-arms. Thunberg says he knew one of these men who was such an excellent shot, that, on going out in the morning, his balls were counted out to him by his employer, and on returning he furnished the same number of dead buffaloes as he had received of balls. The greatest part of the flesh of the victims falls to the Hottentots, but the hide is the share of their employers. The Hottentots are at no great pains in cooking this meat; they merely cut it in slices, and then smoke and half broil it in the embers of a fire. They often eat it when in the first stage of putrefaction without bread or anything else. To dress the hides of the animals, they merely stretch them out on the ground by means of stakes, after which they strew warm ashes over them, and then scrape off the hair with a large knife or a spade. In the interior of the Cape, even the European farmers used this rude but strong leather for their shoes, as well as for many other purposes.

According to Sparmann the Hottentots make the most successful hunters, so that the "best huntsmen among the farmers are obliged, for the most part, to employ them, as in their skin cloaks they do not excite the attention of the wild beasts so much as the Christians do in their dress. They are likewise ready at any time, when there is occasion for it, to go barefoot, and softly crawl upon their bellies, till they come within a proper distance of the animal. Moreover, when the buffalo at length is irritated, the Hottentots can much easier escape from the

danger which threatens them, than a Christian. I myself, on one occasion, saw two Hottentots run with amazing swiftness when a buffalo was in pursuit of them."

The following incident is related by a correspondent of the Penny Magazine (July 7, 1832), upon the authority of a Dutch-African farmer, who had been an eye-witness of the scene. "A party of hoors had gone out to hunt a troop of buffaloes, which were grazing in a piece of marshy ground, interspersed with groves of yellow wood and mimosa trees, on the very spot where the village of Somerset is now built. As they could not conveniently get within shot of the game, without crossing part of the *valei* or marsh, which did not afford a safe passage for the horses, they agreed to leave their steeds in charge of their Hottentot servants, and to advance on foot, thinking that, if any of the buffaloes should turn upon them, it would be easy to escape across the quagmire; which, though passable for man, would not support the weight of a heavy quadruped. They advanced accordingly, and, under cover of the bushes, approached the game with such advantage, that the first volley brought down three of the fattest of the herd, and so severely wounded the great bull leader, that he dropped on his knees, bellowing with pain: thinking him mortally wounded, the foremost of the huntsmen issued from the covert and began reloading his musket as he advanced to give him a finishing shot. But no sooner did the infuriated animal see his foe in front of him, than he sprang up and rushed headlong upon him. The man, throwing down his empty gun, fled towards the quagmire; but the savage beast was so close upon him, that he despaired of escaping in that direction, and, turning suddenly round a clump of copsewood, began to climb an old mimosa tree which stood at the one side of it.

Bounding forward with a roar, which my informant (who was of the party) described as being one of the most frightful sounds he ever heard, he caught the unfortunate man with his horns, just as he had nearly escaped his reach, and tossed him into the air with such force that the body fell dreadfully mangled into a lofty cleft of the tree. The buffalo ran round the tree once or twice, apparently looking for the man, until, weakened with loss of blood, he again sunk on his knees. The rest of the party, then recovering from their confusion, came up and dispatched him, though too late to save their comrade, whose body was hanging in the tree quite dead."

The traveller Thunberg had an encounter with a buffalo bull of great size, which nearly terminated in the same fatal manner. It was met in a deep thicket near the Koukouma river, and killed two of the horses of the party on the spot, and drove the naturalist and two of his companions to seek refuge in the branches of tall trees, where they climbed, and remained until the savage brute departed.

So tremendous was this animal's attack, that the first horse fell on its back, with its feet in the air, and all its entrails hanging out, in which state it lived almost half an hour; while the second horse was perforated through the breast by its horns, which even went through the saddle, and was thrown to the ground, and died instantly with many of its bones broken.

It is a curious fact, and agrees with what we have related in a preceding volume of this series on the subject of the elephant, which is never so ferocious as when found in a solitary state, expelled from the society of its fellow creatures, that the Hottentots assured Thunberg, "That they had before observed that one solitary buffalo haunted that wood, which was so spiteful that he had been driven away from

his herd by the other buffaloes, and obliged to live alone."

On the following year, during a second journey into Caffraria, the same excellent traveller came suddenly in sight of an immense herd of five or six hundred buffaloes. As they were in the act of grazing with their heads down, they did not observe the travellers until they were within three hundred paces of them, when they suddenly and all together lifted up their savage-looking heads, and gazed attentively at the intruders.

Thunberg, though alarmed at so vast an assemblage, was better acquainted with their habits than before, and remained perfectly quiet until they again peacefully bent down their heads to graze. He and his party then advanced until they were within forty paces of the herd, on which the animals looked up, facing them with a brisk and undaunted air. Then six muskets and a number of javelins were discharged at them. Alarmed at the flash and report of the fire-arms, the mass of the buffaloes turned about and made for some neighbouring woods. The fire, however, had taken still more effect, for some of them, sorely wounded, could not keep up with the herd. One ball entered the chest of an old bull buffalo, and penetrated through the greatest part of his body, notwithstanding which he ran for several hundred paces at speed before he fell. A cow was also killed by the muskets, and the Hottentots despatched a calf with their javelins.

The body of the bull was so thick that Thunberg could not get on it as it lay on the ground, without taking a running jump. It was of a dark grey colour, almost without hairs, which, in the younger animals are black. The legs, as usual, were comparatively very short.

Though old, Thunberg says that so far from being

tough and coarse, the flesh was tender, and tasted like other game. The parts which the Hottentots preferred, and which they considered as a great luxury, were the marrow-bones; these they broiled and ate with great eagerness.

In reference to the ferocity of the buffalo, M. Lichtenstein informs us, in his travels in Southern Africa, that he stopped one night at a spring that was called *Buffelhout*, because a Hottentot had once been nearly trodden to death on the spot by a buffalo. A few days after the same traveller met an Hottentot who had been thrown down by a buffalo, and so much hurt as to be rendered an absolute cripple; and he afterwards saw many of these savages who bore about their person melancholy proofs of the mischievousness of this animal: among others a Beetjuan, whose left ear had been severed from his head by the tread of a buffalo as if it had been cut off by a razor. According to Hottentot practice the poor man was nicknamed from this adventure.

On a considerable plain near the country of the Beetjuans in the interior of the Cape of Good Hope, M. Lichtenstein saw and gave chase to a large herd of wild buffaloes. A large bull buffalo was shot, and fell, but he was still alive when the traveller and his party came up, "and so enraged, tearing the ground with his horns, notwithstanding that a large quantity of blood had already flowed from the great artery of the neck, which was shot through, that nobody dared to go near so powerful a creature, struggling with the agonies of death, till the conflict was ended."

While dissecting this animal Lichtenstein was struck with a peculiarity in its structure, which seems to have been overlooked by Sparmann, and other accurate observers: this was the extraordinary breadth and closeness of its rib-bones, which almost

joined to one another, so that, externally, nothing at all could be seen of the intercostal muscles.

The entrails of the buffalo are exactly like those of the ox, but much larger in proportion. Its hide is in great request with the farmers of the Cape, for making thongs and harness; it is prepared in a very simple manner, but very effectually by the Hottentots. This strong, tough leather is held superior to every other material as traces for oxen and horses.*

Though the thick, tough hide of the buffalo seems to protect it from the sting of the gad-fly and other winged insects, the animal, both in its savage and tamed state, is very liable to the annoyance of a sort of louse which gathers in its short hair and in the crevices or breaks in its hide. Sparmann says that the lice he found upon an old buffalo killed near the Cape of Good Hope were of an entirely new species. He thought this subject worthy of a description, which, with drawings of the insect, he afterwards inserted in vol. vii. of '*Mémoires sur les Insectes.*'

It is the general opinion of the natives of Southern Africa, that though the lion frequently attacks the buffalo, he cannot overcome it by dint of strength, but has recourse to stratagem, lying in ambush near some stream where the buffalo comes to drink. Then, they say, the lion springs upon its back, and if it can get a good gripe at the nape of the neck, by that, and wounding the sides of the animal with its

* "The hide is thick and tough, and is in great request with the farmers for thongs and harnesses. Of it are made the only halters that can be depended upon for securing horses and oxen; so that these beasts cannot get loose by snapping them asunder, which they are otherwise apt to do, when lions and wolves make their appearance in the neighbourhood. Every such halter should be a finger and a half in breadth, and about three yards long,—they are sold a good way up the country for a quarter of a rixdollar a-piece."

tremendous claws, the lion wearies out the buffalo, which soon sinks to the ground and dies. At other times, it is said, the lion slyly stealing on the buffalo, fastens upon its nostrils and mouth with both its paws, and squeezes them till the poor animal is almost strangled. The lion, however, does not always make these attacks with impunity, for his carcase is sometimes found, evidently gored and trampled by the buffaloes.

Sparmann informs us that he received many accounts from the natives respecting the difficulty experienced by the lion in killing this powerful and resolute beast, which it does not venture to attack openly, but that, stealing on the buffalo, "it fastens with both its paws upon the nostrils and mouth of the beast, and keeps squeezing them close till at length the creature is strangled, wearied out, and dies." A colonist, according to Sparmann had had an opportunity of seeing an attack of this kind, and others had reason to conclude that something of this nature had passed, from seeing buffaloes which had escaped from the clutches of lions and bore the marks of the claws of these animals about their nose and mouth. "They asserted however that the lion itself risked its life in such attempts, especially if any other buffalo was at hand to rescue that which was attacked. It was said that a traveller once had an opportunity of seeing a female buffalo with her calf defended by a river at her back, keep for a long time five lions at bay which partly surrounded her, but did not (at least as long as the traveller looked on) dare to attack her. I have been informed from very good authority, that on a plain to the east of *Kromme-river*, a lion had been gored and trampled to death by a herd of cattle; having, urged probably by hunger, ventured to attack them in broad daylight."

Like all animals, the Cape buffalo is most formidable when its courage is called forth by affection for its progeny. The same remark applies also to the common tame buffalo even when it has long been employed like an ox to draw waggons; no force can separate it from its young. To effect this, stratagem must be used, and the animal has been known to attack and sometimes to kill the man she suspected of having deprived her of her calf. It is very dangerous for an inexperienced stranger to intrude upon them at this season; they scowl savagely at him with their small, fiery eyes, they will not retreat an inch, but placing themselves between the intruder and their young, they incline their heads, and are pretty sure to rush at him if he make too near an approach. So sensitive indeed are they, that even the flight of a bird near their calf seems to irritate them.

Few experiments have been made to render the Cape buffalo useful to man, in the capacity of a beast of labour, similar to its Indian relative. Sparmann saw a buffalo calf that had been taken shortly after birth, as tame as the ordinary calves among which it was grazing, and observes that he has not the least doubt of the possibility of breaking in the Cape buffalo to the yoke, provided the calves are taken young, and trained from an early period. We should much question however whether the animals would ever become thoroughly docile, even as docile as the common buffalo; at all events the difficulties to be encountered would hardly be compensated by the ultimate success of the endeavour.

The following account of an attack by Sparmann and his party on one of these animals, shows how difficult it is to kill the Cape buffalo; and how dangerous it is to advance when the animal falls on receiving the first discharge. It was on the borders

of the Great Fish River that Sparmann on one occasion fell in with several buffaloes, "upon which," says the writer, "we advanced till within twenty or thirty paces of the beast; when, perhaps in some degree actuated by our fears, we discharged our pieces pretty nearly at the same time, while the buffalo, which was behind a thin scrambling bush, upon rather lower ground than we were, seemed to turn his head round in order to make towards us; in the mean while, however, the moment we had discharged our guns we had the pleasure to see him fall, and directly afterwards run down into the thickest part of the wood. This induced us to hope that the shot had proved mortal: for which reason we had the imprudence to follow him down into the close thickets where, luckily for us, we could get no farther. We had however, as we afterwards found, only hit the hindmost part of the chine, where the balls, which lay at the distance of three inches from each other, had been shivered to pieces against the bones. In the mean while our temerity, which chiefly proceeded from hurry and ignorance, was considered by the Hottentots as a proof of spirit and intrepidity hardly to be equalled, on which account from that instant they ever after appeared to entertain an infinitely higher opinion of our courage than they had ever done before. Several of our Hottentots now came to us and threw stones down into the dale, though without success, in order to find out by the bellowings of the beast whither he had retired: afterwards, however, he seemed to have plucked up his courage, for he came up at last out of the vale of his own accord to the skirts of the wood, and placed himself so as to have a full view of us on the spot where we were resting ourselves somewhat higher up: his intention was in all probability, and in the opinion of our old sportsmen, to

revenge himself on us, if we had not happened to see him in time and fired at him directly. What perhaps in some measure put a stop to his boldness, was that we stood on higher ground than he did: for several veteran sportsmen have assured me of it as a fact, that they know from experience, that the buffaloes do not willingly venture to ascend any hill or eminence in order to attack any one. The third shot, which afterwards was observed to have entered at the belly, was fatal. This occasioned the buffalo to take himself down again into the vale, dyeing the ground and bushes all the way he went with his blood. Though still hot upon the chase, yet we advanced with the greatest caution, accompanied by two of our Hot-tentots, through the thin and more pervious part of the wood where the buffalo had taken refuge. He was advancing again in order to attack some of us, when Mr. Immelman, from the place where he was posted, shot him in the lungs. Notwithstanding this he had still strength enough left to make a circuit of a hundred and fifty paces before we heard him fall. During his fall, and before he died, he bellowed in a most stupendous manner, and this death-song of his inspired every one of us with joy on account of the victory we had gained; and so thoroughly steeled is frequently the human heart against the sufferings of the brute creation, that we hastened forwards in order to enjoy the pleasure of seeing the buffalo struggle with the pangs of death. I happened to be foremost amongst them; and I think it impossible for anguish, accompanied by a savage fierceness, to be painted in stronger colours than they were in the countenance of this buffalo. I was within ten steps of him when he perceived me, and bellowing raised himself suddenly again on his legs." This was the last effort of the poor beast; but so terrified was Sparmann at the moment, that his shot missed its

huge body, and having thus fired unsuccessfully he precipitately fled. On another occasion Sparmann records the destruction of a buffalo, by one of his Hottentots, who was in the utmost danger of being trampled to death. Exciting, from the risk attending it, the chase of this animal is eagerly followed, inso-much that the buffalo is now only to be met within the interior of the country: in many parts where a few years since it was very common, not a single individual is to be found, and as the colonisation of Southern Africa continues it will become still more and more scarce, and have the range of its territory more and more restricted, till, with the elephant and other large beasts, it will only find a precarious shelter in the deepest forest, from which it may even be ultimately extirpated.

The flesh of the Cape buffalo, according to the accounts of those that have partaken of it, is much superior to that of the common buffalo: it is said by Sparmann to be coarse, not very fat, but full of juice and of a high and not disagreeable flavour.

CHAPTER VIII.
BISON.



Bison Europæus, Bos Urus, Gmel.

We have already stated that the term *bison* was given by the ancients to a large animal of the bovine race, which Cuvier supposes to be that now termed aurochs by the Germans, and zubr by the Poles (*Bos Urus*, Gmel), which is still wild in the forest of Bialowieza (in Lithuania). The true *urus* of the ancients, according to Cuvier, now extinct, was re-

garded by that philosopher as the origin of our domestic cattle. In an admirable paper, by Dr. Weissenborn, in the Magazine of Natural History for May, 1838, and June, 1838, the idea of Cuvier, that the urus and bison were distinct species, is warmly contested. This clever naturalist maintains, that the ancients were only acquainted with one wild ox, inhabiting the vast forests which then ran through central Europe, which, in different places, had different appellations: and he observes, that "the result at which we have at length arrived is, that the urus and bison are the same animal, and that we have, for the creature now called in the system *bos urus*, four sets of synonymes; viz., one, probably of barbarous origin, but employed by Aristotle, *bonasus*, *monassus*; one, it seems, also of barbarous origin, *bison*, *vison*, *wisont*, *wisant*, &c.; one, derived from the same root as *taurus*; (the syllable *or* or *ur* of the primitive language from which the Greek *ὄρος* and the very word *origin* are derived, and which conveys the idea of what is ancient and grand); *urus*, Gall. and Lat.; *our*, *auer*, *ur*, *auerechs*, Germ.; *ure-ox*, Engl.; *tar*, Pol.; *tor*, Russ.; *tyr*, Dan., and one of Slavonian origin; *zimbr*, Mold.; and *zubr*, Lith." At the same time, Dr. Weissenborn admits that the semifossilised skulls found in the superficial strata in different parts of Europe, may be, as considered by Cuvier, relics of the original type of one common ox, a type which vanished at a far remoter period than that of Pliny, Cæsar, or even Aristotle. In a question of this kind, it is almost impossible to arrive at definite conclusions; one thing, however, is clear, that the *bison* of America has no claim to the title thus imposed upon it: in one respect, however, the adoption of the appellation may

* Some years since, a living specimen was exhibited to the inhabitants of the British metropolis as the *bonasus* of Aris-

be justified. If the *urus* and *bison* of the ancients were, as Dr. Weissenborn asserts, the same, we find, in this trans-atlantic ox, another species of the peculiar subgeneric group, of which the aurochs will then be the European and this animal the New World representatives. The affinity between the aurochs and the American bison, as indicated by their general form and habits, is very decided. In one respect, however, the aurochs approaches nearer the common ox, than does the American bison; we allude to the number of ribs, which in the ox are thirteen on each side, in the aurochs fourteen, in the bison fifteen; yet, strange to say, while the antipathy of the aurochs against the ox is violent in the extreme, the American bison, if we are to credit Rafinesque (see *Dictionnaire Classique d'Histoire Naturelle*), is domesticated on the farms of Kentucky, and there associates with the cow, the mixed breed having the colour, the head, and the shaggy front of the bison, but not the withers elevated, though the back still slopes. This mixed breed is said to be reproductive. How far this statement of the domestication of the bison, and its intermixture with the ox, is based upon facts, we do not presume to say; it is probably correct though the *Encyclopædia Americana*, makes no mention of such a practice, nor are we aware of Rafinesque's authority.* Certain it is that the two

totle; the absurdity of this name, as applicable to a New World animal, might excite a laugh, were it not that in such an unworthy way errors arise, and, once arisen, they continue long.

* Dr. Weissenborn, corroborates this statement: he says, "Moreover, the American ox (bison) has not the same antipathy to the *bos taurus* as the zubr; it may be used to produce a mixed breed with the domesticated cattle, and is at all events more tameable, as numbers of them are kept in the paddocks of the western states of North America, whereof I obtained certain information from Mr. W. Lenz, who returned from his travels in America but a few months ago."—*Mag. Nat. Hist.*, June, 1838, p. 305.

animals are widely distinct,—utterly dissimilar in habits and manners; and as opposite in outward figure as two animals can be, both belonging to the same natural genus.



Bison Americanus.

The American bison is about equal in weight and size to the mighty aurochs of the Lithuanian forest (which animal, however, is said to be greatly degenerated), and is therefore far larger, and more bulky than our ox; the head is very ponderous, the forehead is broad, bold, and elevated; the horns are planted widely asunder at the base, with an arched ridge between them; they are short and sharp, and with a slight curvature directed upwards; the withers are greatly elevated, the protuberance not consisting,

as in the zubr, merely of a mass of fatty matter, but of a deposit of this, supported by the spinous processes of the anterior dorsal vertebra, which are greatly developed in order to give a more extensive space for the lodgment of the powerful muscles of the neck necessary for sustaining the weight of the skull. From the withers to the crupper there is a considerable obliquity, so that the hind quarters seem small in proportion to the fore quarters, which, with the head, have their apparent magnitude increased by a thick shaggy coat of long woolly hair, forming the same sort of mane as we see in the lion, and adding much to the animal's grim and savage aspect. The hind quarters are clothed with short curling hair, which becomes somewhat woolly in the depth of winter, but falls off almost entirely in the summer, at the latter part of which the animal has acquired a new coat of a dark glossy blackish brown, which lengthens during the continuance of winter, loses its lustre, and becomes of a dirty yellowish brown. The eyes are small and piercing. The limbs are short, and very muscular. The tail is short, about twenty inches in length, and nearly naked except at the tip, where it is terminated by a tuft of long black hairs. The bison, when full grown, will sometimes weigh as much as 2,000 pounds, but twelve or fourteen hundred-weight is the average weight of a full grown bull; its length, exclusive of the tail, is about eight feet and a half; its height at the fore quarters being upwards of six. The cow has a smaller head, and a shorter mane than the bull, and is also generally less in stature.

Formerly the range of this noble animal in North America was much more extensive than at present: it has retired before the influx of the white population to remote and almost unvisited districts, where it still roams in vast herds, tenanted the prairies watered by the Arkansas, Platte, Missouri, and

upper branches of the Saskatchewan and Peace Rivers, and the flat limestone district north of the Great Slave Lake, to the 63rd or 64th degree of latitude. At no remote period the bison was common in the western parts of Pennsylvania; and in Kentucky herds existed as late as the year 1766; at present, however, the animal is rarely seen south of the Ohio, or on the east side of the Mississippi. In New Mexico and California, on both sides of the rocky mountain chain it is very numerous, and its numbers are said to be increasing in the wild districts westward of the sources of the Saskatchewan, a passage through the mountains there having afforded the means of retiring to a safer asylum. Captains Lewis and Clarke bear frequent testimony to the vast numbers in which the bisons collect on the banks of the Missouri, and state on one occasion, "Such was the multitude of these animals, that although the river, including an island over which they passed, was a mile in breadth, the herd stretched, as thick as they could swim, completely from one side to the other." On another occasion it is stated that of "the moving multitude which darkened the whole plains, we are convinced that twenty thousand would be no exaggerated number. Dr. James tells us that, "In the middle of the day countless thousands of them were seen coming in from every quarter to the stagnant pools," and that their paths are as "frequent and almost as conspicuous as the roads in the most populous parts of the United States." In its habits the bison is in a certain sense migratory: the herds, which consist either of bulls exclusively, or of cows, headed by one or two old bulls, wander constantly from place to place in search of food. The tender grass, which springs up after a fire has spread over the prairie is a favourite article of diet; and they congregate wherever salt springs or lakes are plenti-

ful, being partial to salt, which they lick with avidity, and which is evidently needed as conducing to health. Morning and evening are the times in which the bisons feed. In summer, during the heat of the day, they indulge themselves in bathing or wallowing in the marshy swamps of the prairies, or even in the deep rivers, for they swim with the greatest ease. In winter, however, the bath is relinquished, and as food becomes scarcer, they have to employ a greater part of their time in obtaining it: they dig away the snow with their feet in order to reach the grass beneath; and they travel from marsh to marsh in quest of the rushes, sedges, &c., which now constitute a welcome supply. The males and females associate together from the end of July to the beginning of September, after which the females separate from the males, each party as we have said forming itself into distinct herds. It is only while the males associate with the females that the former are dangerous to man, from whom at other times they turn, and flee with precipitation, unless indeed when wounded or hard pressed. At this season they rush upon any one that ventures to approach them, and not only so, but engage among themselves in the most desperate conflicts, the loud roaring of the assembled multitude resembling, it is said, the noise of thunder. The females calve in April; the young seldom leave the mother until they are a year old, and sometimes they remain with her much longer. These are placed in the centre of the herd, and the cows on the approach of any savage animal form a circle round them, with their horns levelled for action. The acuteness of the scent of the bison is such that it is difficult for an enemy to come upon it by surprise,—the young, however, frequently fall a sacrifice to wolves and grizzly bears, the latter being terrible even to the full-grown bulls. Hunting the bison is a sport in which both the colo-



Female Bison of North America.

nists and the Indians take the greatest delight: the former use the musket, as do the Indians also, but not always; one of their modes being that of surrounding the herds not only of bisons, but of elks and deer, congregated in a given space, and gradually driving them into impassable ravines, or upon the precipitous confines of rocky cliffs, where with lances, and bows and arrows, they kill as many as they desire. The danger attending this mode arises from the emergency of their situation, for emboldened by numbers, and urged on by despair, the troop will often break through the line of hunters, trampling down all in their way. Sometimes they are driven into a small space by setting fire to the prairies all round; and being greatly terrified by the flames, they lose all conduct or presence of mind, if the expression be allowed, and are easily slaughtered. In this manner it is said that vast numbers, 1,500 or

2,000 have been killed at a time. Sir J. Franklin (Polar Sea, p. 112, &c.) describes other methods practised by the Indians, one of which is by driving the herd into a pound; another, by hunting down a single animal on horseback, and shooting it in full career; the former mode also much depends on the horsemen who drive the rushing herd along. This method is very similar to that of taking elephants in the island of Ceylon; but on a smaller scale.

The flesh of the bison is regarded as excellent, resembling, when the animal is in good condition, well fed beef; that of the females in full flesh is usually preferred as being finer grained than that of the bulls; the tongue is a great delicacy, as is also the hump of flesh covering the long spinous processes of the first dorsal vertebræ. "It is termed *bos* by the Canadian voyagers, and *wig* by the Orkney men in the service of the Hudson's Bay Company. It has a fine grain, and when salted and cut transversely is almost as rich and tender as the tongue." The Indian method of preparing this delicacy is said to be as follows: the hump is cut off the shoulders and a piece of skin is sewed over the severed part; the hair is then singed off and the whole is ready for the oven; this is a hole in the earth, in and over which a fire has been burned, and into this heated receptacle the hump is conveyed, and covered about a foot deep with earth and ashes. A strong fire is again laid over the spot, and supposing these preparations have begun on the evening of one day, the hump will be ready for eating by the next day at noon. Either prepared in the Indian mode, or pickled as a tongue, the dish is excellent. Much of the pemmican used by the voyagers attached to the fur companies, Dr. Richardson states, is made of bison meat, procured at their posts on the Red River and Saskatchewan. One bison cow in good condition furnishes dried meat

and fat enough to make a bag of pemmican, weighing 90 lbs. The skins of the bisons are of too loose and spongy a texture to make tough or durable leather; but dressed in the Indian manner with the hair on, they form excellent blankets, the hair being soft and woolly. A good bison skin thus dressed will sell for three or four pounds in Canada, where they are used as cloaks or wrappers by persons travelling over the snow in sleighs or carioles. The fineness of the wool, could it be procured in sufficient quantity without decreasing the herds, would prove a recommendation to its use in the manufactures of our country; indeed fine and excellent cloth has been made in England from it, and in the settlement of Osnaboyna on the Red River a coarse but durable cloth of firm texture is formed of it. It felts as well as the wool of the sheep, and the coarser portion is manufactured into hats. It need scarcely be observed that vast multitudes of bisons are slaughtered every year, and numbers wantonly; the white settlers are too apt to follow the chase for the mere sake of the pleasure, forgetful that if the ratio of destruction goes on as it has done within the last century, in a little time the bison will be as rare in America as is the aurochs in Europe, and that in thus extirpating an animal so useful, and which it is for the interest of the colonisers to protect, they are doing a positive injustice to a future generation. It is only surprising that the bisons are still so abundant; but as we have said, the herds are changing their territories, districts where they were once numerous being now perfectly deserted, while the remote regions of the west as yet uncolonised, have received accessions. Let us hope that the bison may not share the fate of many other animals, whose territories have become the property of civilised man. Hunter (see his Captivity among the

Indians, &c.) shows that besides man the bison has to contend with other enemies, which thin its numbers. Of these we have mentioned the grizzly bear and the wolf; the jaguar (or panther as it is called in America) is a dreadful foe, inasmuch as escape from it is more difficult, and resistance less practicable from the mode of its assault, but happily it is less common than the wolf or bear.

We may conclude our history of the bison by remarking that a very fine female forms a distinguishing ornament in the Gardens of the Zoological Society.

As an appendix to our history of the bison, it will not be out of place, if we here proceed to give a short sketch of the history of its Old World relative, the little known and almost extinct aurochs or zubr, our information respecting which is derived from a valuable paper by Dr. Weissenborn of Weimar, published in the 'Magazine of Natural History for May and June, 1838.'

The resemblance between the bison and the aurochs is such as to have induced Pallas, who was not aware of the anatomical distinction between them, to regard them as the same animals; independently however of this difference, the aurochs exhales a strong musky odour which may be perceived at a great distance; while "the comparative shortness of the legs, tail and horns, the weakness of the croup, the somewhat greater breadth of the forehead and the orbits, which descend less, and have less projecting rims in the *Bos Americanus*, constitute differences of outward structure, which to a somewhat practised eye give to that species an aspect, by which it may be at once distinguished from the *Bos urus*." "The size of this animal in its present abode (the forest of Bialowicza, pronounced Bealawezha in Poland), is considerably less than it

was formerly ; a deterioration which may be observed in all those wild herbivorous animals whose liberty is checked by the approach of human cultivation, and which no longer have a perfectly uncontrolled choice of locality and pasture."

The six-years-old male, lately obtained for the Museum of Wilna, measured only six feet eleven and a half French inches, from the crown of the head to the base of the tail ; its height at the crupper four feet four and a half inches ; and at the withers four feet nine inches French. We read, however, that in the year 1595 an aurochs was killed near Friedrichsburg which measured thirteen feet long, and seven feet high ; and another specimen killed with forty-one others, in the forest of Bialowicza, by King Augustus III. of Poland, in the year 1752, weighed 1450 pounds. Count J. Sigismundus held a hunting party in 1612, when eight aurochs were killed, of which the largest weighed 1770 pounds. "In ages more remote," adds Dr. Weissenborn, "we may suppose that the old bulls sometimes grew to a size which makes the statement of Cæsar as to their bulk being little less than an elephant's, appear only a moderate exaggeration. Now-a-days the old males are never found more than seven and a half feet (French measure) in length, and five in height, though in the time of Pallas there was found one that measured six feet at the withers."*

"The hair of the zubr is of two different sorts ; the one is soft, woolly, and short, almost like that of the camel, and covers the whole trunk and the extremities down to the knees ; the other, long, rough, thicker at the extremity than at the root, and covers the upper

* For ourselves we are somewhat sceptical respecting the great degeneracy of this animal. It is a point however on which we shall not dwell, suffice it that we know what the aurochs is at present.

part and sides of the head, as well as the neck, withers, and shoulders; between the edges of the lower jaw, along the neck to the chest, it is lengthened into a sort of beard, and on the upper crest of the neck it forms a sort of mane. The hair is of different qualities according to the age, sex, and season. In young specimens it is browner, softer, and much shorter; in the old ones, blacker, stiffer, and longer. In the bull, it often grows at the beard, the mane, and on the shoulders, to the length of one foot; in the cow, scarcely more than nine inches. It is thickest, longest, and darkest in November, as the winter fur appears with the first snow; and it begins to fall off at the approach of the warm season, sometimes as early as February. The change then, according to Mr. Eichwald, is often effected within two or three days. The summer fur is far less shaggy, and being at first of a greyish brown colour, becomes more and more shining, until, in the month of August, it presents a jet black colour under certain angles of reflection."

"The horns bear a fine proportion to the size of the animal. The horns of the six-years-old bull, whose skeleton was prepared for the Wilna Museum, measure ten and a half inches round, at the base; while their length along the external curve is eighteen inches. They are flattened in no part of their extent, but are perfectly round, and rendered more or less rough near the root by rings. From the root, which is comparatively thick, they are first directed outwardly and a little downwards; then they rise upwards, and the suddenly-tapering point is bent inward and a little backward. These organs are much longer and stronger in the bull than in the cow. Their colour is black, and their substance very hard.

"The expression of the eye, which is considerably smaller than in the *Bos taurus*, is meek when the

animal is not irritated, but becomes exceedingly ferocious when its anger is awakened. The *pupil* then becomes a perpendicular slit, whilst the white *sclerotica* occupies the fore-part of the space between the eyelids, and much of the red *conjunctiva* becomes visible, and the eyes appear to sparkle and assume the expression of madness.

“The tongue, which, near its base especially, is covered with hard tubercles, has a blue colour, as well as the lips, gums, and palate. Bojanus says, that in three adult specimens he found the colour of the tongue but little different from that of the common ox: but Jarocki confirms Gilbert's statement as to the blue colour. This probably increases with the state of excitement of the capillary vessels, and is in a great measure lost some time after death, and Bojanus appears to have seen only specimens that had been killed some time before.

“The tail is covered with short hair, and furnished at its extremity with a brush of long and bristly hair, which is nearly as stiff as that of a horse's tail. In young specimens this brush comes no farther down than the hock joint; whereas in the old ones it reaches somewhat below it.

“The *vertebræ* of the tail descend only as low as the middle of the thigh, or opposite the knee-joint, and the length of the brush never exceeds 15 inches according to Hagen (1. c. p. 213). The statement of Cuvier that the tail reaches the ground is therefore erroneous.

“The smell from which the *Bos urus* has either obtained the name of bison, or which has taken its German name, bisam, from that of the animal, is between that of musk and violets. Its chief seat is that part of the skin and hair which covers the convexity of the forehead. It is stronger in the male than in the female, and strongest during the rutting

season, when it may be perceived at the distance of a hundred yards from the herd. The flesh of the zubr is not, however, tainted with it, as in the *B. moschatus*; on the contrary, it is extremely well-flavoured, and Jarocki says, its taste is between that of the elk and ox, which does not convey any definite idea, to such as, like myself, have never tasted the former.* It was so highly esteemed in former times, that pickled zubr-beef was sent from Poland as a present to foreign kings. The flesh of the zubr, roasted, looks bluish.

“The age to which the *Bos urus* attains, is differently stated by different authors. Some assert that the animal never lives longer than fifteen or sixteen years; others allow it as many as twenty; but the game-keepers in the forest of Bialowicza, who, I think, ought to be heard before all others in that matter, believe that it lives fifty years and upwards.

“The strength of the zubr is enormous, and trees of five or six inches in diameter cannot withstand the thrust of old bulls. It is neither afraid of the wolf nor bear, and assails its enemies both with its horns and hoofs. An old zubr is a match for four wolves; packs of the latter animal however sometimes hunt down even old bulls, when alone, but a herd of zubrs has nothing to fear from any rapacious animal.

“Notwithstanding the great bulk of its body, the zubr can run very swiftly. In galloping, its hoofs are raised above its head, which it carries very low. The animal has, however, but little bottom, and seldom runs farther than one or two English miles. It swims with great agility, and is very fond of bathing.

“The zubr is generally exceedingly shy, and avoids the approach of man. They can only be approached

* Prince Dolgorukow's guests recognised in it a slight resinous taste.

from the leeward, as their smell is extremely acute. But when accidentally and suddenly fallen in with, they will passionately assail the intruder. In such fits of passion the animal thrusts out its tongue repeatedly, lashes its sides with its tail, and the reddened and sparkling eyes project from their sockets and roll furiously. Such is their innate wildness, that none of them has ever been completely tamed. When taken young they become, it is true, accustomed to their keepers, but the approach of other persons renders them furious, and even their keepers must be careful always to wear the same sort of dress, when going near them. Their great antipathy to the *Bos Taurus*, which they either avoid or kill, would render their domestication, if it were practicable, but little desirable. The experiments made with a view of obtaining a mixed breed from the zubr and *Bos Taurus* have all failed, and are now strictly prohibited. Probably there is something in the smell of the tame cattle which the zubr detests. But for this aversion, the crossing might produce a valuable breed, as the flavour of the beef might not only be improved, but the quality of the leather also changed considerably for the better; for the hide of the zubr is double the thickness of that of a common ox, and is extremely tough, and far more durable for all sorts of harness work.

“Now and then individuals of the zubr become, in their wild state, uncommonly daring and fearless of man. This is particularly the case in such old bulls as walk alone. An instance is related by Jarocki, where an old male of that description almost got the character of a highwayman. He would station himself on the high road, and, without minding the clack of whips, rush at the carriages or sledges, and make the horses run away.

“Up to the age of ten or twelve years, the zubrs

live together in herds of from ten to forty head. At a greater age, the bulls either separate themselves of their own accord, or are expelled from the herd. However, in the rutting season, these old bulls join the herd again, and even such as are no longer capable of propagating their species, which they are said to be up to the age of thirty, are considerably excited, and rage indiscriminately against their own kind. At this season, three-years-old bulls, and even cows, are not unfrequently found killed by these savage anchorites; which, as the processes of the dorsal *vertebræ* continue growing, are easily distinguished by the great development of the boss of their withers.—The rest are particularly playful during that season, and delight in up-rooting young trees, whereby they sometimes injure their horns.

“As to the period of gestation in this species, I find different statements. In the French dictionaries of natural history, it is said to last eleven months. Bojanus says it lasts nine, and Mr. Eichwald, seven or eight, as he found that the calves are born about the latter end of March. They generally bear but one calf, but at the most vigorous age sometimes have twins. The calf follows the mother as soon as it is born, and is suckled for a whole year, according to Jarocki; Mr. Eichwald, on the contrary, says the males drive it away from the cow at the beginning of the rutting season, which would make the sucking time only five or five and a half months. As, however, the game-keepers know with precision that the cows bear only once in three years, I have the greater faith in Mr. Jarocki's statement.

“The thickets near the swampy banks of rivers and rivulets are the favourite places where the *Bos urus* takes up his residence, and from which the animal seldom walks to any considerable distance. In summer, and during the warmer portion of autumn,

they select sandy spots; in winter, they keep quiet by day, in the thickest part of fir wood, only browsing at night, and finding sustenance in the bark of young trees. In spring they resort to neighbouring places where the herbaceous plant they relish begin to sprout.

“The food of the *Bos urus* consists, first, of the bark of trees; and it is to the bitter ones, as willows, poplars, horse-chesnuts, &c., that they give the preference. The hardness of these substances often causes the incisors, in old zubrs, to be worn away down to the gums. They are also fond of lichens which grow on trees, but never touch mosses that grow on the ground. As to herbaceous plants, they give the preference to those which grow in swampy localities, as several of the *Umbellatae*, as well as *Cnicus oleraceus*, and different *Ranunculi*. Of grasses they relish *Agrostis arundinacea*, and particularly the dabrowka (*Hierochloe* or *Holcus borealis*). The tomka, (*Anthoxanthum odoratum*), on which it has been asserted that the zubr chiefly relies for its subsistence, and to which some authors have attributed the musky smell of the animal, is not found at all in the forest of Bialowicza. The list of these vegetables, as well as the habits of the zubr, prove to a certainty that it has not been destined by nature to live upon mountains.

“The voice of the *Bos urus* is a short grunt, and when a person is near a herd, it may be compared to the sound of a distant straggling fire of soldiery; at a greater distance it resembles the sound made by birds in flying.

“When the stomach of the *Bos urus* is opened, and a light brought near the opening, a high flame is seen flashing up. Mr. Jarocki mentions this as something peculiar to the species; but the stomach of all ruminating, and other animals, evolves inflam-

mable gases: and that which causes the well-known disease in cows, sheep, &c., called *tympanitis*, consists for the greater part of hydrogen. This circumstance, therefore, appears to possess no particular interest.

“I shall now conclude my description of the *Bos urus* with adverting to the peculiar circumstances under which that animal is now living in the forest of Bialowicza, which may be considered as the only primitive forest in Europe. This woodland district is level upon the whole, and swampy. It is intersected by numerous rivulets, and a considerable river, the Narew; these have their origin in many morasses, some of which have not yet been thoroughly investigated. Its total surface amounts to about 352 English geographical square miles, of which about 60 are rushy swamps; the remainder is overgrown with Scotch and red firs, in the proportion of four-fifths; and with numerous species of deciduous trees in that of one-fifth. A list of these may be found in Baron de Brincken’s ‘Mémoire descriptif sur la forêt impériale de Bialowicza, &c.’ Varsovie, 1826. In this forest, where the elk is also still met with, there were, according to the census of 1828 given by Mr. Eichwald, 696 head of zubrs, and thirty or forty besides in a neighbouring wood of comparatively small extent. Mr. Jarocki, who gives the number of them after the census of 1829, states the sum total of the adult individuals to have been at that time 663, and 48 calves besides. Whether the number has subsequently considerably decreased, as supposed by Dr. H. O. Lenz, (‘Gemeinnützige Naturgeschichte,’ p. 419), in consequence of the Polish revolution, is to me very doubtful, as I have been assured by a Polish gentleman that the forest of Bialowicza had not, in any appreciable degree, been disturbed during that period.”

“ In this forest the zubr lives, under the protection of strict but no longer inhuman game laws, as much as possible in its primitive state of locality and liberty. Yet are they so far affected by the cultivation which circumscribes them, that without the assistance of man, they could not well get through the winter. During that season, they receive supplies of hay at certain places, where the stacks must be well secured, otherwise the zubrs break into them, and spoil much more than they consume, by thrusting their heads deeply into the mass of hay, in order to get at the most fragrant part of it.

“ All noisy occupations are strictly prohibited in those parts of the forest where the zubrs live, and when wolves are hunted, it is done with great caution and but few dogs.

* * * * *

“ In our days when one or more zubrs are to be killed, which can be legally done only by the especial permission of the Emperor of Russia, the wood is beaten up as for other game, but the drivers, who are furnished with sticks, beat against the trees, shouting ‘ Uhaha.’ The marksmen must be posted to the leeward of the zubrs, otherwise the latter will infallibly force their way through the line of drivers.

“ From the time of Augustus III. down to the year 1836, the forest of Bialowicza had not been the scene of a solemn zubr-chase. On the 12th of October, 1836, however, one was held, with a view of furnishing some of the museums in Prussia with specimens; and Prince Dolgorukow, the governor-general of the province of Bialystock, who presided at it, caused it to be conducted with more than usual solemnity. Two thousand drivers and marksmen were assembled, besides an immense number of spectators whom curiosity had drawn to the spot,

where a balcony of fir-branches had been erected for the prince and his suite. Thither different herds of zubrs were driven to be fired at, and the flesh of the largest bull was dressed, to give additional interest to the concluding act of the party—a plentiful dinner."

THE MUSK OX—(*Ovibus moschatus blaino*).



Musk Ox of North America.

THE high northern regions of the American continent present us with another and most remarkable

species of the bovine group, the southern range of whose habitat begins where the northern range of the bison terminates,—namely, about the sixtieth parallel of latitude; from this degree northward the musk ox tenants the barren and desolate regions stretching onwards to the pole. Rare instances indeed are on record of its having been seen in latitude sixty-one, and even fifty-nine; at least Hearne states that he saw the tracks of *one* within a few miles of Fort Churchill, but this is an unusual occurrence. Westward of Hudson's Bay the musk ox is rarely seen in any numbers lower than sixty-seven degrees, though from the circumstance of their skulls and horns being occasionally found near the northern borders of the Great Slave Lake, it is probable, as Dr. Richardson remarks, that at no very distant period they ranged over the whole country lying betwixt that great sheet of water and the Polar Sea. "I have not heard," he adds, "of their having been seen on the banks of Mackenzie's River to the southward of Great Bear Lake, nor do they come to the south-western end of that lake, although they exist in numbers on its north-eastern arm. They range over the islands which lie to the north of the American continent as far as Melville Island, in latitude seventy-five; but they do not, like the reindeer, extend to Greenland, Spitzbergen, or Lapland. From Indian information we learn that to the westward of the Rocky Mountains, which skirt the Mackenzie, there is an extensive tract of barren country, which is also inhabited by the musk ox and reindeer. It is to the Russian traders that we must look for information on this head; but it is probable that, owing to the greater mildness of the climate to the westward of the Rocky Mountains, the musk ox, which affects a cold barren district where grass is replaced by lichens, does not range so far to the

southward on the Pacific Coast as it does on the shores of Hudson Bay. It is not known in New Caledonia, nor on the banks of the Columbia, nor is it found on the Rocky Mountain ridge at the usual crossing places near the sources of the Peace, Elk, and Saskatchewan rivers. It is therefore fair to conclude that the animal described by Fathers Marco de Niça and Gomorra, as an inhabitant of New Mexico, and which Pennant refers to the musk ox, is of a different species. Its description—namely, that it is a sheep as large as a horse, with long hair, a short tail, and enormous horns, leads one to suspect that this animal may possibly be the big-horn (*ovis montana*) which is known to inhabit the range of the Rocky Mountains as far south as the fortieth degree, and which probably extends much further, were it not for its size, which is very far inferior to that of a horse, though not much less than that of the musk ox. The height at the shoulder of an old male big-horn is three feet five or six inches. It is more than probable, however, that the size of the animal described by the Fathers Marco de Niça and Gomorra was greatly exaggerated, and the more so as they did not see with the eyes of naturalists. In the appendix to Parry's Second Voyage, it is stated respecting the musk ox that it inhabits the North Georgian Islands in the summer months. The animals "arrived in Melville Island in the middle of May, crossing the ice from the southward, and quitted it on their return towards the end of September." It would appear from this that, as is the case to a greater or less degree with all the animals peculiar to the arctic regions of America, its habits are migratory. On the above statement Dr. Richardson remarks, "The appearance of musk oxen on Melville Island, in the month of May, as ascertained on Captain Parry's First Voyage, is interesting, not merely as a part of their natu-

ral history, but as giving us reason to infer that a chain of islands lies between Melville Island and Cape Lyon, or that Wollaston and Banks' Lands form one large island, over which the migrations of the animals must have been performed." "The districts," he adds, "inhabited by the musk ox are the proper lands of the Esquimaux, and neither the Northern Indians nor the Crees have an original name for it, both terming it the bison with an additional epithet." By the Esquimaux it is called *oomingmak*; the Chepewans and Copper Indians call it *adgiddah-yawseh*, or little bison; the Cree Indians *matheh-moostoos*, or ugly bison. In the appendix to Parry's Voyage it is stated that, according to the information of the Esquimaux, the musk ox inhabits "the country on the west of Davis's Straits, and on the north of Baffin's Bay, as a head and horns and a drawing of a bull, being shown to the Esquimaux of the west coast of Davis's Straits (who were communicated with on the 7th of September), were immediately recognised, and the animal called by the name of *umingmack*. This is evidently the same with the *umimak* of the Esquimaux of Wolstenhome Sound, who were visited by the former expedition, and of which nothing more could be learned at the time from their description than that it was a large horned animal inhabiting the land, and certainly not a reindeer. It is probable that the individuals which extend their summer migration to the north-east of Baffin's Bay retire during the winter to the continent of America, or to its neighbourhood, as the species is unknown in South Greenland." It is very remarkable that the skulls of a species of musk ox closely allied to, if not identical with the American animal, have been found in Siberia on the flats near the mouth of the Oby. Pallas regarded the skulls there found as being those of the American species—if so, it may be as Cuvier

supposes who observes, "it would appear that its skull and bones have been sometimes carried on masses of ice even to Siberia." Most authors, however, regard these skulls as belonging to an extinct species, bearing the same relationship to the existing musk ox as did the mammoth to the Asiatic elephant. Dr. Richardson emphatically says, "The musk ox has not crossed over to the Asiatic shore, although fossil skulls have been found there of a species nearly allied, which has been enumerated in the systematic works under the name of *ovibos Pallantis*."

In size, the musk ox nearly equals the small breed of cattle peculiar to highland districts of Scotland; the head is large and broad, and the nose very obtuse; there is no naked muzzle as in our ox, for the upper-lip, which is destitute of a furrow, and the chin, are covered with a close coat of short white hairs. The nostrils are oblong slits, inclining towards each other from above downwards; their inner margins, for the breadth of about three lines, are naked. It is on the absence of a true muzzle, that is of a broad, naked space extending between and around the nostrils, and occupying the upper-lip (as we see on the cow) that the genus *ovibos* is founded for the reception of this animal. The word is compounded of *ovis* a sheep, and *bos* an ox; the animal having the general aspect and character of the ox, but agreeing with the sheep and the goat in not having a naked muzzle. This point may seem of little importance, but such is not the case; it is connected with the habits of the animal, and therefore of more consequence than might at first be suspected. With a broad naked muzzle is associated that mode of taking food expressed by the term *grazing*. But ruminants having the muzzle hairy, as the sheep, *browse*—they nip the herbage, making a certain use of their lips, in guiding or collecting it—these parts

enjoy greater mobility, and a certain degree of prehension. The food of the musk ox for the chief portion of the year consists of lichens, which cover the rocks, and on which the animal *browses*; in summer, coarse grasses, the twigs of willow, birch, pine-shoots, and other herbage, constitute its fare.

The horns form another peculiarity of the musk-ox, and much resemble in form those of the African buffalo; at their origin they are flatly convex, broad and massive, covering the brow and whole crown of the head, and are in the males in complete contact at their base throughout its whole breadth—in the females they do not quite touch each other. As each horn rises from its broad basal portion it becomes round and tapering, and sweeps directly downwards between the eye and the ear, until it reaches the angle of the mouth, when it turns with a bold curve upwards in the segment of a circle to above the level of the eye. The basal portion of the horns is rough, with longitudinal filaments, and of a dull white,—beyond this they become smooth and shining, and terminate in black points.

The eyes are moderate, with greatly projecting orbits; the ears are short and scarcely to be seen amidst the long hairs of the head; and the tail being of small dimensions is quite concealed by the long woolly fur of the haunches. A dweller within the Arctic circle, and destined to endure the rigours of an arctic winter, the musk ox is fitted by its clothing for the temperature of the regions appointed as its abode. Long, thick, woolly hair covers the whole of its body, and hangs nearly to the ground; from the throat it falls in thick masses like a mane; on the neck, shoulders, and haunches it is long and matted; underneath the outer is an inner layer of exquisitely fine wool, from which stockings have been made more beautiful than those of silk, and which, could

it be produced in sufficient quantity, would be of high value in commerce.

The general colour of the musk ox is brown, more or less grizzled about the shoulders, with a brownish white mark on the back, forming, as Captain Parry terms it, a saddle. The limbs, which are short and very muscular, are clothed with close brown hair unmixed with wool. The hoofs so closely resemble those of the rein-deer of the same regions, that it requires a very experienced hunter to discriminate between the impressions either animal leaves in the snow or soft soil over which it is passing; they are narrower in the musk ox than in the reindeer; and this, which is very slight, is the only difference. The musk ox dwells in herds, which frequent the more rocky parts of the country, often destitute of wood, except along the banks of the larger rivers, which are more or less clothed with spruce firs, willows, and shrubs. Its activity is very great, and it climbs the heights with the utmost facility. Dr. Richardson observes that "notwithstanding the shortness of its legs, the musk ox runs fast, and it climbs hills and rocks with great ease. One pursued on the banks of the Coppermine scaled a lofty sand cliff having so great a declivity that we were obliged to crawl on hands and knees to follow it." Captain Franklin states that "The musk oxen, like the buffalo (bison), herd together in bands, and generally frequent barren grounds during the summer months, keeping near the rivers, but retire to the woods in winter. They seem to be less watchful than most other wild animals; and when grazing, are not difficult to approach, provided the hunters go against the wind. When two or three men go so near a herd as to fire at them from different points, these animals, instead of separating or running away, huddle closer together, and several are generally killed; but if the wound is

not mortal they become enraged, and dart in the most furious manner at the hunters, who must be very dexterous to evade them. They can defend themselves by their powerful horns against wolves and bears, which, as the Indians say, they not unfrequently kill. The musk oxen feed on the same substances as the reindeer The largest killed by us did not exceed in weight three hundred pounds. The flesh has a musky disagreeable flavour, particularly when the animal is lean, which, unfortunately for us, was the case with all that we now killed."

The weight, however, attained by the musk ox when in good condition is about seven hundred pounds, at least bulls of this species killed during Parry's second voyage averaged this weight, and yielded about four hundred pounds of solid meat; they stood about ten and a half hands high at the withers. Dr. Richardson gives the weight of the musk ox, exclusive of the offal, as three hundred pounds, which is nearly three times as much as a barren-ground caribou (reindeer), and twice as much as one of the woodland caribou. He also observes that the food of the musk ox is the same as that of the caribou, viz., grass at one season, and lichens at another; "the contents of its paunch are eaten by the natives with the same relish that they devour the *nerrooks** of the caribou. When this animal is fat, its flesh is well tasted, and resembles that of the caribou, but has a coarser grain. The

* "The stomach (of the reindeer) and its contents, termed by the Esquimaux *nerrooks*, and by the Greenlanders *nerrookak* or *noorookak*, are also eaten; and it would appear that the lichens and other vegetable matters on which the caribou feeds are more easily digested by the human stomach, when they are mixed with the salivary and gastric juices of a ruminating animal."—Richardson, *Fauna Boreali America*, *Mamm.*, p. 245.

flesh of the bulls is high flavoured, and both bulls and cows, when lean, smell strongly of musk, their flesh at the same time being dark and tough, and certainly far inferior to that of any other ruminating animal existing in North America.

A noble specimen of this animal, procured during one of Captain Parry's expeditions to the Polar Seas, graces the British Museum.

CHAPTER XI.

THE SHEEP.

THE genus *ovis*, which comprehends the sheep and its immediate allies, is distinguished from that of *capra* (including the goats) by several slight differences; which, if taken singly, are of little value, but, when taken in the aggregate, form a tangible ground on which to base the respective genera.

Cuvier says, "The goats (*capra*, Linn.) have their horns directed upwards and backwards; their chin is generally furnished with a long beard, and their chaffron is almost always *concave*. The ~~sheep~~" he observes, "have the horns directed backwards, and then spirally sweeping forwards to a greater or less degree; their chaffron is generally *convex*, and they are destitute of a beard. So little, however, do they deserve to be generically separated from the goats, that they even produce together a mixed fertile race."

In the proceedings of the Zool. Soc. for 1834, p. 108 *et seq.*, is the following table of differences between the goat and sheep, and some observations on these animals by B. H. Hodgson, Esq.

Goat.	Sheep.
Whole structure strong and compact.	Less so.
Limbs thick and rigid.	Feeble and more slender.
Hoofs high and compact.	Lower, and less so.
False hoofs well developed.	Evanescent.
Head small and fine.	Larger and heavier.
Facial line straight.	Chaffron arched.
Ears short and rounded.	Longer and pointed.

Goat.	Sheep.
Tail short, flat, naked below.	Longer, less depressed, and half-naked only.
Withers higher than croup.	Croup higher.
Fore legs longer than hind.	Fore and hind equal
Croup sloped off.	Not so.
Odorous.	Not so.
Nose moist, and nares short and wide.	Less moist, longer and narrower.
Horns of medial size, keeled, and turned upwards.	Horns very large, not keeled, and turned to the sides.
Eye dark and keen.	Paler and duller.
Hair long and unequal.	Short and equal.
Bears change of climate well.	Bears it ill.
Is eminently curious, capricious, and confident.	Is incurious, staid, and timid.
Barks trees with its horns, feeding on the peel, and on aromatic shrubs.	Does not bark trees, and is less addicted to aromatics.
In fighting, rears itself on its hind legs, and lets the weight of its body fall on the adversary.	In fighting, runs a-tilt, adding the force of impulse to that of weight.

“The goat and sheep have, in common, hair and wool; and no beard, no suborbital sinuses, evanescent muzzle, no inguinal pores, horns in contact at the top of the head, knees and *sternum* (breastbone) callous, angular and transversely wrinkled horns, striated ears, two teats only in the females, horns on both sexes, and, lastly, incisors of precisely the same form. Of the various diagnostics then proposed by Colonel Hamilton Smith, it would seem that the following only can be perfectly relied on, to separate *ovis* from *capra*:—Slender limbs, longer pointed ears, chaffron arched, *yares* (nostrils) long and oblique, very voluminous horns, turned laterally, with double flexures. I should add, myself, the strong and invariable distinction, males not odorous, as opposed to the males odorous of the genus *capra*. But, after all, there are no physical distinctions at all

equivalent to the moral ones, so finely and truly delineated by Buffon, and which, notwithstanding all that Col. H. Smith urges in favour of the courage and activity of the sheep, will for ever continue to be recognised as the only essential diagnostics of the two genera."

In one point, the writer of the foregoing extract is not precisely correct; and it is upon this point that we would lay a decided stress in our statement of the generic distinctions between *ovis* and *capra*: we allude to the presence of suborbital pits,* which Mr. Hodgson says (and most naturalists believe) are wanting both in the *sheep* and the goat. In the *goat*, indeed, they are wanting; but in the *sheep* they are not only present, but are large and deep: the orifice, however, is a slit, and, unless specially sought for, is not to be seen amidst the woolly fur, or dense hair, with which the sheep or the wild mouflon is invested. In the presence or absence, then, of this pit below the inner angle of the eye, we have a character by which to discriminate between two genera so closely allied, as otherwise to render it difficult to draw a definite line between them. To this may be added the less obvious character, consisting in the presence of an interdigital sack or pit in the sheep, which is wanting in the goat. This sack, between and at the base of the toes, is lined with hair, and furnished with sebaceous follicles for the secretion of a lubricating fluid.

To dwell upon the differences between the goat and the sheep may appear unnecessary to those who judge only from the domestic races of each with which we are so familiar in Europe; but the domestic races of these animals in other parts of the world do not possess those marked features which

* It was by Mr. Ogilby that this character was first pointed out.

we are accustomed to see in our own races—features which we habitually associate with the respective idea of each animal, and which we are, therefore, inclined to think must be essential. But, granting even that the specific distinction between the goat and the sheep may be everywhere clear and palpable, yet the grounds on which to separate them, generically, have been indeterminate. Of the many characters proposed—none, perhaps, of great importance—that consisting of the presence on the one hand, and the absence on the other, of suborbital pits, is the surest.

The varieties of the common sheep (*ovis aries*) are innumerable; widely indeed do they differ from each other in external form and clothing, nor know we which of them to refer to as the type, or as nearest the original stock from which all claim their descent. The sheep—and the observation applies to all our domestic animals—cannot be traced to any known wild origin, we can identify no wild species as its undoubted type; conjectures indeed have been abundantly hazarded, but the mystery has not been solved; it remains as it did, a stumbling block in the path of zoological research. Most naturalists look to the mouflon of Corsica (*ovis musimon*) as the wild type of the sheep, and some regard this to be the origin of the European breeds, and the argali of Siberia (*ovis ammon*) that of the Eastern races. The reasons upon which it is assumed that the mouflon, or the argali, are the wild types of either European or Asiatic races of sheep, appear very problematical, and on the whole we are disposed to consider the domestic breeds of sheep as the descendants of a race subject from the beginning to man, and no longer in an independent condition. As we fail, on the one hand, to ascertain with anything like certainty the primitive wild stock of our domestic

ances; so, on the other hand, we are in utter ignorance as to the circumstances attending the first endeavours to reclaim them from their natural independence.

“The weakest species of useful animals,” says Buffon, “were the first that were reduced into a state of domestication. The sheep and the goat were subjugated before the conquest of the horse, the ox, or the camel; with greater ease also, have they been transported from climate to climate; whence the great number of varieties into which these two animals have branched out, and the difficulty of knowing which is the true origin of each. It is certain, as we have demonstrated, that the sheep, such as it exists at present, cannot subsist independently, that is to say, without the succour of man; it is equally certain then that nature has not produced it such as it is, but that it has degenerated in our hands; consequently, we must seek among the wild animals those whom it approaches the nearest, we must compare it with the domestic sheep of foreign countries, investigate in the mean time the different causes of change and degeneration which must have had an influence on the species, and finally endeavour if possible to refer every variety, every pretended species, to a primitive race.” This primitive race, as we have said, is regarded by most, but without proof, as the mouflon, principally we believe because this animal and the common sheep breed together, producing, it is said, a fertile offspring; which circumstance, even if true, is not conclusive. Buffon indeed affirms that the skeleton of the two animals, viz., of the mouflon and the common sheep, resemble each other; but surely the number of the caudal vertebræ in the sheep (whose tail naturally reaches almost to the ground), far exceeds that of the caudal vertebræ of the mouflon, whose tail is so short as scarcely to be perceived.



The Mouflon.

We have no accounts of the early existence of the mouflon in other districts than those it inhabits at the present time. It is a native of Corsica, Sardinia, some of the Greek Isles, and the mountain ranges of Asia Minor. Strong, active, and bold, it occupies the most elevated ridges, where it lives in troops which feed on the mountain herbage, and which in winter descend into the dells among cliffs, or into a lower range of pasturage. In summer, the mouflon is covered with coarse short stiff hair; but in winter this thickens and lengthens, and an undercoat of a finer texture is also added. Pliny notices the mouflon, which, he says, occurs in Spain, but especially in Corsica, and says it is covered with hair resembling that of a goat (*caprino villo*); and Strabo observes that in Sardinia and Corsica are produced sheep called mouflons (*musmones*), which instead of

wool produce hair like that of a goat (*pilum caprinum*). Gesner likens the hair of the mouflon to that of a stag. The hair of the mouflon, however, is not like that of the goat, and still less that of the stag; it is crisp, harsh, brittle, not pressed to the skin, but standing out, and admirably adapted for preserving the body from cold. Mr. Bell affirms that this hair has the essential characters of wool (which indeed the hair of many animals has), and that "it is certainly the original state of the fleece of the sheep, which has become thus improved by care and breeding, until its original coarse character has wholly disappeared." That its hair may be truly wool, we admit; but it by no means therefore follows that the fleece of the sheep is to be traced to it. However, the observations of Mr. Bell respecting the hair of the mouflon are very interesting, inasmuch as they are deduced from his own examination. "The covering of the mouflon," he observes, "differs considerably in its appearance from that of the domestic sheep, and it is customary to account for the difference in the following manner:—It is said by all the naturalists who have written on the subject, that the pelt of the mouflon consists of long hair forming the apparent covering, and of short wool beneath, which is only visible when the former is removed. It is therefore presumed that by domestication this interior covering is developed at the expense of the former, and becomes the woolly pelt of the domestic races. This however is totally erroneous. The longer hairs of the mouflon are in their structure as genuine wool as that of the sheep. They are coarse and stiff, it is true, and nearly straight; but they possess the essential character of wool in the imbricated scaly surface, which gives to wool that remarkable felting property upon which its peculiarity in many cases depends. It is also somewhat

waved, and it requires no considerable change to convert such a filament as this into one of fine curly wool. On the contrary, the short soft pelt which lies at the root of this, is nothing more than extremely fine hair, uniform and smooth over its whole surface, and not assuming the slightest appearance of the woolly texture. I have examined these two kinds of hair of the mouflon from various parts of the animal, and have found no essential variation." The horns of the mouflon are stout, three-sided, transversely wrinkled, arched in the segment of a circle, and directed obliquely backwards and outwards. They are generally wanting in the females, and, where present, are very small. The general colour of the animal is dark brown, passing into rusty yellow on the flanks, crupper, and outer surface of the thighs.

In temper and disposition, the mouflon is far more untractable than any of the domestic sheep; and though inferior in size to some of our English breeds, it is much stronger and more active. Those which we have seen have been stupid, vicious animals, not to be approached without caution, as they strike violent blows, rushing forward with all their force, and repeating the assault with great rapidity. In their native fastnesses the old rams have often most furious contests, in which both have been known to perish. According to Pliny, the mixed breed between this animal and the domestic sheep were called *umbri*. We are not aware that a mixed breed at present exists in any part of Europe; and we believe that the mouflons kept in the menagerie of the Zoological Society never bred with sheep of the domestic race.

A mouflon, closely allied to the Corsican species, exists in the Kachâr region of Nepal, amidst the glaciers of the Himalaya, and both on the Indian and Thibetan sides of the snowy crests of that range.

It is described by Mr. Hodgson (see Zool. Proceeds., 1834, p. 107) under the title of *ovis nâhoor*. It is the nâhoor of the Nepalese. In size it is considerably larger than the *ovis musman*, the measurements of an adult male being thus stated: from snout to rump forty-eight inches; height, thirty-two. The horns are twenty-two inches along the curve, and are inserted high above the orbits, on the crown of the forehead, touching nearly at the base, whence they diverge greatly, but can scarcely be said to be spirally turned. They are first erected upwards, considerably before the facial line, and then sweep downwards with a bold curve, the points being recurved upwards and inwards. They are uncompressed, triangular, broadly convexed to the front, and sharp-edged at the back: they are transversely wrinkled, except near the tips, which are smooth and round. The double flexure of the horns, their presence in the females, and the want of a tuft beneath the throat, are the points, according to Mr. Hodgson, in which the nâhoor differs from the mouflon. In the mouflons which we have seen, the tuft under the throat was not apparent; perhaps it is more distinguishable in summer when the hair of the body is short, than in winter when the development of the hair would tend to the obliteration of any sensible difference between its length in one part and another. The nâhoor is bold and active; the females have the chaffron straight, and the horns short, erect, sabre-curved, and greatly depressed. According to the authority already referred to, the nâhoor refuses to breed with the domestic sheep—a point of some importance. The colour of this animal is very similar to that of the mouflon, and is described as being of a pale slaty tint, obscured with earthy brown: in summer, overlaid with a rufous tint. Head below, and inside of

limbs and hams, yellowish white; face, and fronts of the entire limbs and chest, blackish; bands on the flanks, and tip of tail, the same; tongue and palate dark; eye, yellow hazel.

We have stated that another source to which the domestic sheep, and especially the Asiatic races, have been ascribed, is the argali of Siberia (*ovis ammon*, Eixl; *ovis argali*, Bodd.) The probability of the argali being the type of the sheep, we think to be less than that of the mouflon. It is true, however, that Buffon regards these two animals as specifically identical; and Mr. Bell observes,—“Even to the present day there appears to be some doubt whether the argali of Asia may not be a geographical variety of the musmon, and whether, therefore, different stocks of the domestic sheep may not have originated from the two forms.” M. Gmelin, to whom Buffon appeals as an authority in his favour, concludes an admirable description of the argali, as follows:—“By its hair, the flavour of its flesh, its form, and vivacity, this animal belongs to the deer tribe; but from this class, its horns, which are permanent, and not shed, exclude it. The horns, curved in a circle, give it some resemblance to the sheep: the absence of wool, and its vivacity, distinguish it altogether from the sheep. The character of its hair, its abode on rocks and elevated places, and its frequent combats, place it in some degree of approximation with the goats; but the want of a beard, and the figure of the horns, forbid this. May we not then the rather regard this animal as forming a particular section? and do we not see in it the musmon of the ancients? In fact, it resembles in a remarkable manner the description given by Pliny, and, still better, that of the learned Gesner.” For ourselves, we cannot but regard the argali as specifically distinct from the mouflon. It far exceeds this latter

animal in size, and differs in certain permanent marks of colouring; having a haunch mark, as in the stag, of a yellowish colour, around the base of the tail. There are horns, moreover, in both sexes, which are not small in the female, and in the males are of large dimensions, insomuch that the small fox of Siberia (the isatis) is said to make use of such as have been struck off during the furious contests in which the males often engage, as a place of retreat and concealment. The range of the argali extends through the vast chain of mountains which runs through the centre of Asia to the Eastern Sea, and in the branches which that great chain sends off to Tartary and Northern China, and hence onward to Kamtschatka. Throughout this extensive range, it dwells amidst the rocks, avoiding the presence of man, before whom it retires to remote solitudes. No animal is more shy, and its cunning and activity render the task of the sportsman who wishes to obtain a specimen one of great difficulty. Wild, however, as are the adults, the young are easily tamed, as has been proved by Russian colonists in Tartary, who fed them first with milk, and then with fodder, like the domestic sheep, and gradually rendered them familiar with the flock, and from which they showed no inclination to escape and revisit their native fastnesses. * The adult argali equals a fallow deer in height, but is a much more stout and bulky animal; its limbs are shorter, and its whole form more robust. * The male exceeds the female. One which Pallas procured weighed 310 medical pounds. The horns alone often weigh sixteen pounds, and measure from three to four feet in length. The ears are small and erect.

The argali generally herd in flocks of ten or twelve in number, which tenant the lower mountain ranges at a far less elevation than that occupied by the ibex of the same regions. During the spring and



Head of the East Indian Argali.

summer, they pasture on the sides of the hills, or among the secluded valleys, at a certain elevation among the mountains, whence, as winter approaches, they descend lower in search of food, which is then scarce, and not easily attainable. At this season they are very thin; but during the summer, while food is plentiful, they are fat, and in high request, their flesh being then excellent. At certain times of the year the males are fierce, and fight obstinately with each other; but at other times they are quiet, and even timid, rarely offering resistance when pursued, unless driven to desperation. The females produce young in spring, and the lambs are covered with a soft gray curling fleece; the situation of the future horns are each indicated by a large flat protuberance.

The summer coat of the adults consists of short, smooth hair, resembling that of the deer. In winter this lengthens, and conceals an under vest of thick, close, woolly hair, of a whitish colour. The general tint of the hair in summer is reddish brown, which changes to brownish gray in winter, the buff disc on

the haunch continuing throughout the year. In the female, however, this mark is much less conspicuous.

The argali, before Siberia was colonised, was common in the mountains adjacent to the river Irtisch; but it is now rare in these parts, if not altogether extirpated. Its name, argali, is said to signify in Siberia "wild sheep;" its appellation in the Russian language is "Kammenoi barann," which signifies the sheep of the rock. The propensity for salt, so remarkable in the ox, the domestic sheep, and other ruminants, is also manifested by this animal; and it is said regularly to repair in spring to the salt marshes which are so abundant in Siberia and Tartary. Exhausted by the cold, and enfeebled by the scanty fare of winter, the stimulus of this material may be needed, as tending to the restoration of the health and vigour of its system. It is no doubt to this animal, the argali, that Captain Kotzebue alludes, as inhabiting the rugged mountain ranges of Kamtschatka. The great peninsula of Kamtschatka, it may be observed, is between the same parallels of latitude, or nearly so, as Great Britain, but, from its geological formation, and other circumstances, its climate is infinitely more rigid than even that of the most northern parts of Scotland. A single chain of lofty mountains, in many parts covered with perpetual snow and glaciers, runs from one end of the peninsula to the other, and is based upon nearly its entire breadth. These mountains are broken into jagged rocks and tremendous precipices, exhibiting everywhere signs of volcanic violence; while in some places, as in Iceland, the waters of volcanoes are still in activity, and are seen pouring out smoke and flame and streams of lava in the midst of ice and snow. The natives possess no domesticated sheep; but the argali abounds, and is hunted for the sake of its flesh.

"The Kamtschatkan sheep," says Captain Kotzebue (see Voyage from 1823 to 1826), "is amazingly fleet and active, exhibiting itself on the loftiest pinnacles, and achieving, like the chamois, prodigious springs among the rocks and precipices, and is, consequently, with difficulty killed or taken. In preparing for these leaps, its eye measures the distance with surprising accuracy. The animal then contracts its legs, and darts forward head-foremost to the destined spot, where it alights upon its feet; nor is it ever seen to miss, although the point may be so small as to admit its four feet only by their being closely pressed together. The manner in which it balances itself after such leaps is also admirable: our ballet-dancers would consider it a specimen of a perfect *à plomb*."

Closely allied to the Asiatic argali, and, indeed, regarded by many as a mere variety, is an animal termed high-horn, or Rocky Mountain sheep, tenantiing the Rocky Mountain range of North America, and, as most suppose, first discovered by the Fathers Piccolo and de Salvatierra, when, in 1697, they established the first mission in California, nearly two centuries after the first discovery of that country.

"We found," observes Father Piccolo, "two sorts of *deer*, that we know nothing of; we call them sheep, because they somewhat resemble ours in make. The first sort is as large as a calf of one or two years old; its head is much like that of a stag, and its horns, which are very large, are like those of a ram; its tail and hair are speckled, and shorter than a stag; but its hoof is large and round, and cleft, as an ox's. I have eaten of these beasts; their flesh is very tender and delicious. The other sort of sheep, some of which are white, and others black, differ less from ours. They are large, and have a great deal more wool, which is very good, and easy

to be spun and wrought." Dr. Richardson, in reference to the above notice, observes,—“ Hernandez, Clavigero, and other writers on California, likewise mention these animals; and Vanegas has given a figure of the first-mentioned one, which has, though evidently on insufficient grounds, been considered to be the same with the Siberian argali, while the one noticed in the latter part of the quotation has been referred to the species described under the name of Rocky Mountain Goat. The speckled hair does not agree with any descriptions I have met with of the Rocky Mountain sheep; nor have I heard that black individuals are ever met with in the herds of the Rocky Mountain goat. It is therefore probable that the Californian animals are different from the allied ones which inhabit the more northern parts of the Rocky Mountain ridge. Mr. David Douglas describes Piccolo's sheep under the name of *ovis Californica*. Pennant, who considers the Asiatic argali (*O. Ammon*) and the Corsican mufro (*O. Musimon*) to be varieties of the same species, says, in 'Arctic Zoology,' that the argali is suspected to be found in California, but not on the best authorities." We cannot, however, but think that the Rocky Mountain sheep was the animal indicated by Piccolo, nor is the vague term *speckled* any formidable obstacle. The colour of the fur of this animal, which is of a dusky brownish hue, resides in the ends of the hair, and as these are rubbed off during the progress of the winter, the tints become paler, some hairs being worn more than others, giving somewhat of a grizzled appearance, which becomes paler and paler, till in the old rams the coat in spring is almost pure white. That grizzled appearance, or the patches caused by the greater abrasion of the hair in one place more than another, might suffice to lead a person writing loosely, and no naturalist, to call the animal speckled.

Though skins of the Rocky Mountain sheep were brought by Captain Cook from the north-west coast of America, and also imported by the North-West Fur Company, it was not until 1803 that the attention of naturalists was drawn towards the animal by a paper published in the 'Medical Repository of New York,' by Mr. M'Gillivray, who had previously procured skins on the mountains in which the Elk river takes its rise, whence others also have since been procured; as well as from the mountains skirting the south bank of the Mackenzie. From one of the specimens procured by Mr. M'Gillivray, which was first deposited in the New York Museum, and afterwards sent to France, M. Geoffrey published a figure and description in the *Annales du Museum*, entitling the animal "Belier sauvage d'Amerique." A fine male and female specimen exist in the museum of the Zoological Society; these were obtained by Dr. Richardson, on the banks of the Mackenzie. From this naturalist we borrow the best description of the habits of this animal which we have yet seen:—

"The Rocky Mountain sheep inhabit the lofty chain of mountains from whence they derive their name, from its northern termination in lat. 68° to about lat. 40°, and most likely still farther south. They also frequent the elevated and craggy ridges, with which the country between the great mountain range and the Pacific is intersected; but they do not appear to have advanced farther to the eastward than the declivity of the Rocky Mountains, nor are they found in any of the hilly tracts nearer to Hudson's Bay. They collect in flocks consisting of from three to thirty; the young rams and the females herding together during the winter and spring, while the old rams form separate flocks, except during the month of December. The ewes bring

forth in June or July, and then retire with their lambs to the most inaccessible heights. Mr. Drummond informs me that in the retired parts of the mountains, where the hunters had seldom penetrated, he found no difficulty in approaching the Rocky Mountain sheep, which there exhibited the simplicity of character so remarkable in the domestic species; but that where they had been often fired at they were exceedingly wild, alarmed their companions on the approach of danger by a hissing noise, and scaled the rocks with a speed and agility that baffled pursuit. He lost several that he had mortally wounded, by their retiring to die amongst the secluded precipices. Their favourite feeding places are grassy knolls skirted by craggy rocks, to which they can retreat when pursued by dogs or wolves. They are accustomed to pay daily visits to certain caves in the mountains that are encrusted with a saline efflorescence, of which they are fond. These caves are situated in slaty rocks, and it was in them alone that Mr. Drummond found the *Weissia macrocarpa* growing. The same gentleman mentions that the horns of the old rams attain a size so enormous, and curve so much forwards and downwards, that they effectually prevent the animal from feeding on level ground. The flesh of the Rocky Mountain sheep is stated, by Mr. Drummond and others who have fed on it, to be quite delicious when it is in season, far superior to that of any of the deer species which frequent the same quarter, and even exceeding in flavour the finest English mutton. The Kamtschatdales in like manner esteem the flesh of the argali as food fit for the gods."

In size, the Rocky Mountain sheep, or big-horn (of Lewis and Clark), exceeds the Asiatic argali. An adult male measures six feet in the length of the

head and body, and three feet five inches in height at the shoulder. The horns are much larger in the male than in the female; in the former they are of great thickness, three-sided, furrowed transversely, and curving from their base first backwards then downwards, forwards, and upwards, until they form a complete turn, during the whole course of which they recede from the head in a spiral manner. In a full-grown male they measure about two feet ten inches, following the curve, and have a basal circumference each of twelve or thirteen inches. In the female they are nearly erect, short, and slightly inclined backwards, and at the tips outwards.

From these wild races of sheep, let us turn to the domestic race, without presuming what is or what is not the source from which it has originally descended.

Long subject to man, and dependent upon him for care and protection, the sheep has in a great measure degenerated into an *artificial* being, and as such, were it not for the perpetual care of man, it would soon rank among the extinct races that have passed away, unless indeed its character and habits underwent a change,—in fact, unless it became again the wild denizen of the mountains, and that this, of the two, would be the case, is by far the most probable. The sheep, as we ordinarily contemplate it, an animal destitute of weapons enabling it effectually to resist even the weaker of the beasts of prey,—deficient in address and cunning, incapable of long-continued speed; timid and irresolute, necessarily requires the care of the shepherd and his dog. Naturally gregarious, the flock follows a leader, where one goes, all follow in succession, and yet, they often rush headlong into the danger from which they would escape. They are easily alarmed, and seldom venture to resist the attack of even the

smallest foe ; and, in some countries, notwithstanding every effort on the part of the shepherd, they fall in multitudes before the wolf and other ferocious beasts. Their physical constitution is far from being robust, and they are subject to many and fatal diseases ;— a rank pasturage, or a rainy season, thins the flock by wholesale. This is one side of the picture. On the other hand, abundant instances might be cited in which the sheep has discovered more address, more vigour, and more courage than could almost have been anticipated ; in fact, the more the sheep is neglected, the more wild it is allowed to run, and the less circumscribed its range of pasturage, the more will it acquire habits of independence, and the more will its instincts become drawn forth, and put into exercise. Under such circumstances it soon begins to display its affinity to the mouflon, and to show that although its instincts are dormant they are not eradicated. Those who have seen the sheep in the wilder and mountainous districts of England, as we have, will agree with us in our opinion. In these districts they will unite in self-defence, and form a phalanx, in opposition to a strange dog, or a prowling fox, the males heading the array, and presenting a formidable front to the foe, while the females and young crowd together in the rear. Should the intruder venture within a certain distance, they rush on him, and commence a violent assault.

From this view of the case, it might be argued that the sheep is not so utterly destitute of intelligence as is usually imagined, and many facts on record seem to justify the conclusion. The habits of the sheep have seldom been sedulously attended to. That the sheep is capable of strong attachment both to individuals of its own species, to other animals, and to man, is abundantly proved. "There are few animals," says

Mr. Youatt, "who form so steady and permanent an affection for each other." There is scarcely a flock in which the same sheep are not always seen side by side, searching for food or ruminating in the fold; hence the practice of including them all, if possible, in one fold at night, that the friends may not be parted. Some careless shepherds are inattentive to this. A writer in an agricultural periodical (*Edinb. Farmer's Mag.*, Aug., p. 4) has given some very good advice on this point. "Here I shall observe—and the observation ought to have its due weight with the shepherd in the disposal of his flock during the night—that the sheep which have been together during the day, and have been making eager and joint exertions for a scanty subsistence, and have alternately sheltered each other from the biting blast and the suffocating drift, and by their perseverance and mutual endeavours have stimulated and supported each other during the day, and have become endeared to each other, should not be separated at night. Their being forcibly parted in the division of the flock has frequently been productive of a degree of alarm and distress that could scarcely be conceived possible—the whole fold has been in one state of continued disturbance; and they who have had observation or feeling enough to appreciate what may occasionally pass in the mind of a sheep have traced to this, or to a similar cause, the after-declension of strength and the inability to endure the inclemency of the season."

A very interesting case in point is also narrated by Mr. Youatt, which we cannot forbear quoting:—"At the present moment (1837) there is in the Regent's Park a poor sheep, with a very bad foot-rot, crawling along the pasture on its knees; it with difficulty contrives to procure for itself subsistence; and the pain which it suffers when compelled to get on

its feet is evidently very great. The author had heard that in such a case, a companion will be seen at a little distance from the sufferer, and that, if that companion be closely regarded, it will always be found to be the same sheep. He found it to be literally the case here. As he pursued his regular morning's walk through the park, he regularly sought out the friends, and after two or three days they seemed to be aware that no harm was intended to them, and they suffered him to approach sufficiently near to observe and to comprehend their intercommunication of signals, and fully to satisfy himself that it was always the same faithful adherent by whom the cripple was solaced and watched. When a sheep becomes blind it is rarely abandoned to itself in this hapless and helpless state; some one of the flock attaches himself to it, and, by bleating, calls it back from the precipice, and the lake, and the pool, and every kind of danger."

The maternal affection of the sheep for her offspring is well known, and many touching instances are on record of the exercise of unexpected intelligence in defending it or rescuing it from peril. "A gentleman of Inverness, on a recent journey in the Highlands, while passing through a lonely and unfrequented district, observed a sheep hurrying towards the road before him, as if to interrupt his progress, and at the same time bleating most piteously. On approaching nearer, the animal redoubled its cries, and, looking significantly in the face of the traveller, seemed to implore some favour or assistance at his hands. Touched with a sight so unusual, the gentleman alighted, and, leaving his gig, followed the sheep to a field in the direction whence it came; there, in a solitary cairn, at a considerable distance from the road, the sheep halted, and the traveller found a lamb completely wedged

is between two large stones of the cairn, and struggling feebly with its legs uppermost. The gentleman instantly extricated the little sufferer, and placed it safely on the neighbouring greensward, while its overjoyed mother poured forth her thanks in a long-continued and grateful if not a musical strain."—See Brown's Sketches, &c.

That the sheep can and often does form an intimacy or friendship with other animals is also proved by many observations.

Mr. Jesse observes that he has seen a sheep which had been brought up by hand, and which had only a solitary horse to bestow its affections upon, forsaking those of its own species, and grazing in preference by the side of its early friend.

The following narrative, from the 'Illustrations of Nat. Hist.' (p. 132), is authentic:—"A drover being on his way to Smithfield-market with a flock of sheep, one of them became so sore-footed and lame, that it could travel no farther. The man, wishing to get rid of the impediment, took up the distressed animal, and dropped it over the pales of a paddock belonging to Mr. O'Kelly, and where the celebrated race-horse Dungannon was then grazing, and pursued his journey, intending to call for the sheep on his return, believing that after a little rest it would quickly recover, and which was the case. A strong attachment, however, soon grew up between the two inhabitants of the paddock; the horse would playfully nibble the neck of the sheep, and, without hurting it, would lift it into the manger of a neighbouring shed belonging to the field, as much as to say, Although you are not able to reach it, I will help you to the banquet; besides this, the horse would on all occasions protect his new friend, and would suffer no one to offer him the slightest molestation. Mr. O'Kelly, having been made ac-

acquainted with these circumstances, bought the sheep, and left the two friends in peaceable possession of the paddock and its adjoining sheiter."

In ancient times, the intimacy, if we may so speak, between the shepherd and his sheep was more close than it is at present, at least in most parts of Europe,—and the necessity of the dog as an assistant was never felt. From this resulted a docility in these animals which is rarely seen in this island. It was a custom to give names to the sheep, which the animals learned (as the dog does), and to which they answered when the shepherd called them. Instead of driving them before him, he walked first, and they followed attentive to his voice; at least, such was the custom in some places; and hence the force of our Saviour's words, in reference to himself as the Good Shepherd:—"The sheep hear his voice, and he calleth his own sheep by name, and leadeth them out, and he goeth before them, and the sheep follow him, for they know his voice." The practice of teaching sheep to know their name and obey when called is not extinct. The Rev. J. Hartley, who has travelled as a missionary in Greece, records in his Journal the following interesting fact, in illustration of the custom alluded to in the sentence above quoted:—"Having had my attention directed to the words (John x. 3) '*The sheep hear his voice, and he calleth his own sheep by name,*' &c., I asked my man if it was usual in Greece to give names to sheep. He informed me that it was, and that the sheep obeyed the shepherd when he called them by their names. This morning I had an opportunity of verifying the truth of this remark. Passing by a flock of sheep, I asked the shepherd the same question which I put to my servant, and he gave me the same answer. I then bade him call one of his sheep; he did so, and it instantly left its pas-

turage and its companions and ran up to the hand of the shepherd, with signs of pleasure and obedience which I had never before observed in any animal. It is also true of the sheep in this country, *that a stranger they will not follow, but will flee from him; for they know not the voice of the strangers.* The shepherd told me that many of his sheep were still WILD; that they had not yet learned their names, but that by teaching they would all learn them. The others, which knew their names, he called TAME.*

When the flock, as was often the case in the earlier ages, was very numerous, it is not to be supposed that every sheep was, as the Greek shepherd said, rendered tame: it would suffice that a few of the leaders, the rams of the flock, should thus be instructed, for so remarkable is the principle of imitation in this animal, that where one goes the flock all follow; and thus one or two, obeying the shepherd's voice, will lead, and, as it were, overrule the actions of the rest. It is thus that the shepherds manage their flocks in some parts of France. "They select certain sheep from the flock; they give them particular names, and teach them to come when they are called. In order to accustom them to this, they make the sheep follow them by offering them a piece of bread. When the shepherd wishes to lead his flock through a defile, or to make them change the direction in which they are proceeding, he calls to him one of these selected sheep. Those that are nearest to him immediately follow, and the others are not far behind; and so, by degrees, the whole flock is disposed to obey the call of the shepherd, and to follow him."—*Instructions pour les Bergers*, p. 15.*

* This practice exists also in England at a distance of less

In mountainous countries, or in wild districts, over which the flocks wander dispersed asunder, the use of the pipe or horn has been known and practised from a very early period; the sheep obeying the signal-notes to which they have been taught obedience. In ancient times shepherds were more musical than in these degenerate days; and are said to have ruled their flocks by their "pandean strains." As they played their simple airs, the sheep would follow, or they would collect at a signal-call. "In many parts of the Alps, and in certain provinces in France, the shepherd and his pipe continue with true antique simplicity. The flock is regularly penned every evening to preserve them from the wolf, and the shepherd returns homeward at sunset, with his sheep following him, and seemingly pleased with the sound of the pipe, which is blown with a reed, and resembles the chanter of a bagpipe." The horn, of rude make and shrill tone, resounding far, is a very common instrument for calling sheep or cattle, and admirably adapted for mountain-ranges and wild extensive pasture-lands. Its use in ancient times was well known. If we are to credit Polybius, the flocks in the island of Ceylon, on the landing of any stranger, would flee into the interior of the country, but at the sound of the shepherd's horn they would return, and congregate around him, forgetting all their fears.

The herdsmen of the Alps use the horn in collecting cattle, and in Lithuania and Muscovy the herdsmen and shepherds lead their cattle, horses, and sheep by the sound of the horn, both to pasture

than twenty miles from London. At Thames Ditton, the shepherd of Captain White, a gentleman residing there, walks every morning and evening before his sheep in going to and returning from their pasture. He also calls by name two of the rams.

and to the water, and again direct their return home; each part of the business having its definite signal. In Sweden and in Iceland the shepherds use horns made of birch-wood. Two excavated pieces of birch-wood are fitted together, and bound tightly round with the bark of the same tree, so that one circular pipe is formed. The sound made by this horn is shrill, but not unpleasant.

From the milk both of the sheep and goat, cheese was made at a very early epoch; most likely, however, it was at first used in its freshly-curdled state (the "pressi copia lactis" of Virgil), but very soon would be discovered its fitness of being kept as a dry and consolidated mass pressed into moulds or wicker baskets. With respect to butter we hear nothing definite concerning it till at a comparatively late period; yet the milk of the sheep (and it was the milk of this animal rather than of the cow which was used in days of antiquity) exceeds that of either the cow, goat, ass, or mare, in the comparative produce of this material. Abram indeed is reported to have set *butter* and milk, and the calf which he had dressed, before the three strangers; and in Isaiah it is written, "It shall come to pass in that day, that a man shall nourish a cow and two sheep; and it shall come to pass for the abundance of milk that they shall give, that he shall eat butter: for butter and honey shall every one eat that is left in the land." Isa. vii. 21, 22.

It is then somewhat strange that neither the ancient Greeks nor the earlier Roman writers allude to this product of the farm seeing that it was already known and valued in the East, though they frequently mention cheese—cheese of ewe-milk, from which it was ordinarily prepared. The word *butyrum*,* indeed (which is used by Pliny), evidently meant an

* From *Βούτ*, an ox, and *Τυγός*, cheese.

imperfect sort of *butter*, mixed, as the account of this material suffices to show, with some portion of curd. Its preparation is directed by Pliny, lib. xxviii. c. 35, who enumerates it rather as among the medicinal preparations in use at Rome than as constituting an article of diet, though he states it to be a delicacy among barbarians, from whom the manufacture of it was evidently derived. Aristotle gives directions respecting cheese, but says nothing about *butter*. Homer, Euripides, and Theocritus speak of cheese, but not of butter, nor does Virgil ever allude to it. The directions of Pliny are as follow:—

“From milk also is *Butyrum* made, a choice article of food among barbarian nations; the use of which distinguishes the rich from the common people. The most is obtained from the cow, and hence its name; the fattest from sheep. It is also made from goat’s milk; in winter the milk requires to be made warm—in summer merely churned by rapid shaking in long vessels, of which the mouth is closed, except a narrow orifice for admitting the air. A little water is added, for the production of acidity. The part that clots swims at the top; this, being removed, and salt added, is called *oxygala*.* The remainder is boiled down in earthen pipkins; there, the supernatant matter is *butyrum*, of an oleaginous nature. The stronger the flavour of this, the more valuable (in medicine) is it accounted. It is an old ingredient in many mixtures. Its nature is (internally) astringent, (externally) an emollient, a filler up and purifier (of wounds or ulcers).”

The mode of procuring butter thus described may be compared with that practised at the present day by the Arabs and Moors. Burckhardt, in his Notes on the Bedouins, says, “By the present Arabs the *camel’s*

* *Oxygala*, from *ὄξύς*, sharp, acid, and *γάλα*, milk.

milk is used to drink either alone or mixed with rice and flour, and either sweet or sour; the butter is made of goat or sheep's milk. It is put into a goat-skin, tied to one of the tent-poles, and for one or two hours constantly moved backwards and forwards. The buttery substance then coagulates, the water is poured out, and the butter is put into another skin. If after two days they have collected a certain quantity of butter, they place it over the fire, throw in a handful of *bourgoul* (wheat boiled with some leaven and then dried in the sun), and leave it to boil, skimming it carefully. After having boiled for some time, the *bourgoul* precipitates all the foreign substances, and the butter remains quite clear at the top. The *bourgoul* that has been thus used is eaten by the children.¹⁷ D'Arvieux states that the Arabs regale themselves at breakfast with butter and honey, adding, "although these do not seem to suit very well, experience teaches that it is no bad mixture, nor disagreeable to the taste of one, if ever so little accustomed to it;" a circumstance which throws light on the expression in Isaiah already alluded to. Speaking of the preparation of butter by the Syrian Arabs, Burckhardt says,—“The sheep and goats are milked, during the three spring months, morning and evening. They are sent out to pasture before sunrise, while the lambs or kids remain in or near the camp. About ten the herd returns, and the lambs are allowed to satiate themselves, after which the ewes belonging to each tent are tied to a long cord and milked one after another. When a ewe is feeble in health, her milk is left wholly for the lamb. The same process occurs at sunset. From a hundred ewes or goats (the milk of which is always mixed together) the Arabs expect in common years about eight pounds of butter per day; or about seven hundred weight in the three spring months. What the

Arab's family does not use is sold to the peasants or townspeople." In Barbary, according to Shaw, the milk of the ewe is put into a goat-skin turned inside out; this is then suspended from one side of the tent to the other, and, on passing it to and fro in one uniform direction, a separation of the buttery and wheyey parts is quickly occasioned. In the Levant, they tread the skin bags (partially filled with milk) with their feet till the butter separates. Between the skin bag and the long vessel in which Pliny directs the milk to be shaken, there is little difference; and with regard to the use of fire in separating the butter from the refuse, we see the practice still continued by the Arabs. The fondness of this people for butter is excessive, they eat it in large quantities; the richer, who can afford it, not only swallowing a large cupful before breakfast, and saturating their food in it, but even snuffing up the semi-concrete oil, into their nostrils. If Pliny alluded to the Arabs, his expression . . . "*butyrum, barbararum gentium lautissimus cibus, et qui divites a plebe discernat,*" is very descriptive.

In Syria, Arabia, and Africa, there exists a breed of sheep, distinguished by a lengthened tail, with an accumulation of fat around its upper part and base; while, equally in Palestine, and, indeed, in Southern Asia generally, and some parts of its more northern regions, but not in Africa, there exists a breed closely allied, indeed, to the former, but distinguished by an accumulation of fat commencing on the loins, whence it swells gradually into a large mass at the rump, assuming the form, when viewed posteriorly, of two rounded projections, almost concealing between them a short conical tail. The first breed may be termed *fat-tailed*, the latter *fat-rumped*. Of the latter, at the present time, are composed the vast flocks of the Turcoman hordes, and of the natives of

the Caucasian range. It exists in Persia, whence a fine specimen in the menagerie] of the Zoological Society was imported. Antony Jenkinson, a writer in the sixteenth century, in his travels from Moscow to Korassan, thus speaks of this breed:—“Their sheep are of great stature, with large buttocks, weighing sixty or eighty pounds in weight.” More modern writers speak of the oily fat on the rump of the sheep of this breed as weighing from twenty to forty pounds. A writer in the ‘Agricultural Magazine’ for 1804 thus describes the Kerguise and the Kalmuc breeds. In the mountainous districts, he observes, “they are higher than a newborn calf, and so strong and heavy, that the full-grown ones weigh between four and five poods.* In shape they resemble the Indian sheep. They have the arched front of the old battering-ram, prominent under-lips, and large pendulous ears: instead of a tail, they have a monstrous round of fat, like a cushion, weighing thirty or forty pounds, and yielding between twenty and thirty pounds of tallow. Their wool is, coarse, entangled together, and strongly mixed with hair: the rams are universally, and the wethers generally, horned, and some, like the Icelandic, have four, five, or six horns. During the whole winter they seek their fodder under the snow, without losing their condition by it. To this the shortness of the season much contributes, as well as the circumstance that the snow passes away more rapidly on the salt parts of the steppes; and all animals are fattened by feeding on the vegetables of a saline soil. So rich is the country with sheep, that common Tartars often possess a thousand, and some of the richer ones more than fifty thousand. The Kalmuckian sheep differ from the Kerguise in their

* A Pood is 36 lbs. English.

smaller size, less curved forehead, lesser although pendulous ears, less hairy wool, and being seldom horned. They are sadly neglected; indeed, it is in a manner impossible to compel the Kalmucs to be good agriculturalists."

The deposition of fat on the haunches of the Tartarian sheep is ascribed by Pallas to the continued influence of the bitter saline pasturage of the districts upon which the flocks and their progenitors have fed; that, in fact, it is a sort of preternatural accumulation, the predisposition to which has become hereditary—but that its actual deposit depends to a great degree on the saline or non-saline nature of the pasturage. With respect to the *fat-tailed* sheep, they are to be regarded as closely allied to the



Syrian Fat-tailed Sheep.

former. They prevail in Syria, Egypt, Æthiopia, Madagascar, the Cape of Good Hope (before the introduction of European breeds), and in many parts of the interior of Africa. Russell mentions two breeds of fat-tailed sheep about Aleppo, in the first of which the caudal deposit of fat is moderate. The other, he adds, are "a sort often mentioned by

travellers on account of their extraordinary tails, which are very broad and large, terminating in a small appendix, that turns back upon it. These tails are of a substance between fat and marrow, which is not eaten separately, but mixed with the lean meat in many of their dishes, and also often used instead of butter." Some of these sheep, he states, attain to the weight of 150 pounds; he observes, however, that "animals of this extraordinary size are very rare, and kept up in yards, so as to be in little danger of hurting their tails as they walk about; but in the fields, in order to prevent injury from the bushes, the shepherds in several places of Syria fix a thin piece of board to the under part, which is not, like the rest, covered with wool, and to this board are sometimes added small wheels, whence, with a little exaggeration, we have the story of the oriental sheep being under the necessity of having carts to carry their tails. But the necessity of carriages for the tails of the African sheep, mentioned by Herodotus, Rudolphus, and others, is real. The tail of that animal, when fat, actually trails, not being tucked up like those of the Syrian sheep." The sheep of Bucharria are described by Pallas as being of moderate size, and in general aspect resembling the fat-rumped breed, except that the muzzle is sharper, and the ears large and pendant. There is a small collection of fat on the rump: the tail is broad at the base, whence it gradually narrows into a long appendage; the wool is compact, thick, soft, and curled into "frizzled circles." In Egypt the fat-tailed race prevails, and especially that breed of it distinguished by long tails reaching to the ground; the shorter and broader tailed kind, however, are not uncommon. The former kind, with tails sometimes weighing eighteen or twenty pounds, prevail in Lower Ethiopia: more south-

wards, however, a black breed, clothed with fine, glossy, soft hair, and having a tail like the ordinary sheep, is noticed by Bruce: but the fat-rumped race is also to be found there. Now the very extent to which these breeds of sheep, or rather, varieties of a peculiar race, are spread in the East, would lead us at once to suspect their antiquity to be very considerable; and, from several expressions in the Scriptures, we may infer that the breed characterised by a deposition of fat upon the *rump* was that which constituted so important a part of the wealth of the patriarchs. In Leviticus (ch. viii. 25) it is said of Moses that he "took the *fat*, and the *rump*, and all the fat that was upon the inwards," &c., and burnt them on the altar; and in another place (ch. ix. 19), he took the fat of a bullock, "and of the ram the *rump*," and "he burnt the fat upon the altar."

From these, and other expressions, there is at least a strong probability that the breed which now prevails in Palestine and in the adjacent parts of South Tartary, is that which Jacob fed when he served Laban seven years for the sake of Rachel.

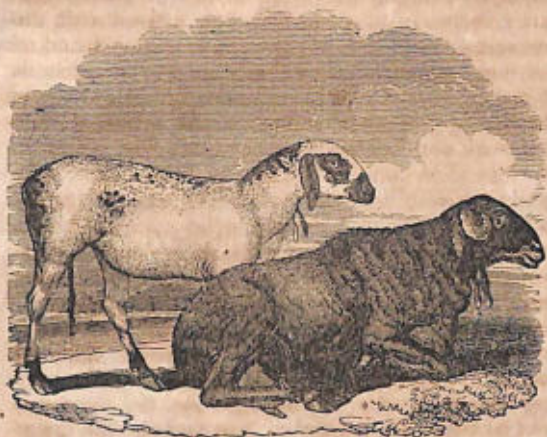
The original colour of the sheep was undoubtedly dark brown, and the change from this colour to white must have been the work of time and judicious breeding. Most writers on the sheep impute, and perhaps justly, the first improvement in this respect to the skill of Jacob; however this may be, white flocks were common at an early date, and in our western portion of the globe have long been universal; still, however, as if to show that nature, though controlled, is not to be subdued, we see lingering traces of the dark brown in many of our breeds; this colour prevailing about the face and on the legs; and now and then a black or dark-coloured lamb may be noticed in the midst of a flock of snowy whiteness; indicating, by its presence, how

easy would be the transition from the acquired but common colour of our races to that of their primeval parents.

The sheep is pre-eminently a wool-bearing animal; yet many races are destitute of this covering, being clothed with short hair,—or, if indeed it be essentially wool, wool approaching hair so closely in appearance as not to be distinguishable from it unless by means of a powerful microscope. The essential character of wool as distinguished from hair consists in its surface being covered with imbricated scales, upon the presence of which and its waviness depends its property of *felting*: that is, of being worked up into a mass of firmness and tenacity by the interlocking of the scales of such fibres as are twisted together with the scales in opposite directions. “Pressure brings the hairs (woolly fibres) against each other, and multiplies points of contact. Agitation gives to each hair a progressive motion towards the root—(we all know how an ear of barley will work its way up a person’s sleeve)—but the roots are disposed in different directions—in every direction;” and thus the scales of the multitudinous and intertwined fibres diversely directed will become locked together. We may here note that other animals besides the sheep are wool-bearers to a greater or less degree—the fur of the bat, the hare, the beaver, the seal, the bear, and many other animals, consists of a mingled mass of hair and wool;—of such is the matted covering of the sheep-dog,—of such the lion’s mane.

Reverting to the sheep; when we say that some races are covered merely with hair, we must be understood as meaning either that the existence of true wool is not abundant, or that, if the hairs be intrinsically wool in their nature, that their properties as such are of the lowest degree. It is in the hotter

regions, more particularly of the African continent, that we meet with these hair-clad breeds. Many of them, and especially the Guinea sheep, so little resemble our European races, that a stranger unacquainted with them, unless he heard them bleat, would hardly know what animals they were. The limbs are long, the body gaunt, the ears pendulous, the forehead much arched, and two wattles or fleshy excrescences hang from the throat.



Guinea Sheep.

A smaller hair-clad breed extends along the Slave Coast. The Fezzan or Barbary sheep, of which we have seen examples in England, closely resemble the Guinea sheep; they want, however, the throat-wattles, but have a pendulous dewlap; their hair is coarse and shaggy, their ears large and pendant, their form spare and gaunt. The males have small horns. Between the hairy breeds and the wool-

bearing races there are many intermediate grades, in which the covering consists of a mixture of coarse wool and coarser hairs; most of the fat-rumped and fat-tailed sheep are thus clothed; such is the case with the Kirguise sheep, with the Persian fat-rumped breed, and with the original Cape breed, which are a very inferior race, having lank necks and bodies, and long pendulous ears, with broad, thick, fatty tails. Their colour is varied,—black, brown, bay, but mostly spotted, and their wool is like frizzled hair, fit only for stuffing cushions and mattresses. It may, however, be remarked, that the rude natives do nothing to improve its quality—they neither wash nor shear their sheep, but let the wool drop off of its own accord, which it does in September or October. The colonization of South Africa has produced a great alteration in the breed of sheep, which is now almost altogether Merino, in great purity.

Among the more excellent wool-bearing races, not in Europe, may be noticed the Thibet, the Bucharian, and some of the Indian breeds; those of Kerman in Persia, and of Khorasan. With respect to the sheep of Thibet, we learn that they are a small race; their heads and legs are black, their wool is soft, and their flesh is said to be the best mutton in the world. No great care seems to be taken of them—they are fed without distinction wherever sufficient pasture is to be found, but principally upon the short herbage peculiar to the sides of eminences and bleak exposed plains.

When the Thibetans slaughter their sheep, they most commonly cure the skins with the wool on them. These skins form a most excellent winter garment for the peasant and the traveller. To obtain fine lamb-skins, which here, as in nearly all the countries of the East, are very highly prized, they have recourse to a cruel but very common practice.

By a Cæsarian operation, they take the offspring prematurely from the womb.

“In order,” says Captain Turner, “to obtain the skin in its highest perfection, the dam is sometimes killed before her time of yeaping; a cruel precaution, which secures, however, a silky softness to the fleece, and stamps a very high price upon it in this region, where the merit of good furs is well ascertained. It serves particularly for lining vests, and is in equal estimation all over Tartary; it bears a very high price also in China. But, powerful as the temptation is, I conclude, from the high prices of such lamb-skins, that the practice is not very frequently adopted.”*

The practice, however, obtains in Tartary, Persia, Turkey, the Crimea, and many other eastern countries.

The sheep, in Thibet, it would appear, is not only valuable for the sake of its flesh and fleece, but also as a beast of burden, as was the llama formerly in the Peruvian Andes. Captain S. Turner informs us that in Thibet he frequently saw numerous flocks of sheep in motion, laden with salt and grain, each animal carrying from twelve to twenty pounds weight. They are also the bearers of their own fleeces to market; the wool is usually fabricated into a narrow cloth resembling frieze, or into thick coarse blankets.

We have already said that the wool of Bucharian sheep is compact, thick, soft, and elastic. That of the lambs is peculiarly valued, being beautifully close and curled;—their colour is black, blueish, or silvery grey; the first, when thoroughly glossy, being the most esteemed. In general, the male lambs are destroyed as soon as born, for the sake

* Account of an Embassy to Thibet.

of their skins, but in some districts the mother is sacrificed that the skin of her unborn young may be obtained, which is accounted more beautiful than it would have been after the creature's birth. The wavy curls are so delicate and glossy as to give the appearance of rich damask.

According to Dr. Anderson, the inhabitants of the Ukraine and Podolia, when a prettily marked lamb is born, sew it up in a sort of vest fitted so closely that it presses the curls of wool to the skin; this vest is enlarged as the animal grows, and is also wetted every day with warm water. The wool thus treated forms into ringlets, which remain permanently *in curl*: and the animal is killed at an earlier or later period, according to the material intended to be produced, viz., whether a short glossy nap for ornamental purposes, or a thicker and longer nap for warm winter clothing.

In Persia, where the shepherds follow the nomadic life of their ancestors, travelling from pasturage to pasturage as necessity compels, many districts produce sheep of peculiar excellence for their wool. The mountainous district of Kerman is especially celebrated; nor less so the province of Khorasan: the character of the wool is soft, fine, and spirally curled; the sheep are of a moderate size, or rather small,—the male is horned, the ears are pendulous, and the tail not well developed as to its breadth or fatness. "At Kabooshan, in the mountains north of Khorasan, is a celebrated manufactory of sheep-skin pelisses, called *posteens*. The skins, having been dressed with the wool on, are cut into narrow stripes; the coarser and inferior portions are rejected, and the others sewed with the wool outside, and made into pelisses, which are almost universally worn in the winter. The best are formed from the skins of unweaned lambs, and are exceedingly light and fine;

the price of those is often enormous. The next in value are from the skin of selected sheep not more than a year old; the coarser skins are used for the poorer people."—See Fraser's Journey through Khorasan, p. 573.

With respect to the Indian breeds, they vary extremely both as to size, general figure, and the character of the wool.

Mr. Moorcroft (see Trans. Royal Asiat. Soc., vol. i. p. 49) says, that the *Pūrik* sheep of Ladakh, in the fineness and weight of its fleece, and in the flavour of its mutton, added to its peculiarities of feeding and constitution, yields not in merit to any race hitherto discovered." "The *Pūrik* sheep gives two lambs within twelve months, and is twice shorn within that period." On the contrary, Col. Sykes (see Proceed. Zool. Soc. 1830-1, p. 105) states that "the variety of sheep most extensively bred in Dukhun, has short legs, short, thickish body, and arched chaffron. The wool is short, crisp, and coarse, and is almost universally black. In most individuals, there is a white streak or line from the anterior angle of each eye towards the mouth, and a white patch on the crown of the head.

Within the territories of the European continent the breeds of sheep are varied *ad infinitum*. One of the most remarkable of these is the Wallachian sheep, or the Cretan sheep of Pennant (*ovis aries*, Var.; *strepsiceros*, Linn.). Though said to be common in Wallachia, Hungary, and the western parts of Asia, sheep of this race are so rarely brought to England or to the adjacent parts of the continent, that we can scarcely be said to be acquainted with it. A few years since, a splendid ram, which came from Mount Parnassus, was presented by Dr. Bowring to the Zoological Society. Its temper was unruly, and its strength and viciousness rendered it not quite

safe to be approached. Its horns were very large and spirally contorted, adding greatly to its striking and picturesque appearance. Its fleece consisted of mingled wool and hair, of which the latter covered the former, being very long, beautifully fine, and falling from the middle of the back on either side of the animal almost to the ground. On the face the hair was short and of a rusty black,—the fleece was white. In most figures and accounts of the Wallachian sheep the horns are represented as rising almost perpendicularly from the skull, making a series of spiral turns in their ascent, the first turn being the largest; while in the female they are said to diverge, taking a lateral direction. In the specimen, however, to which we have alluded, and which was a male, they extended laterally from the skull, and after the first turn took a downward sweep. It is probable, therefore, that, as far as this point is concerned, there is a certain degree of individual variation among the breed; as indeed might be expected, seeing, as we do, how unfixed are all the external characters of the domestic races of the sheep, and how soon they are capable of being modified. According to Belon, this race of sheep occurs in Crete; it appears to have been known in ancient times, and is considered by some to be alluded to both by Ovid and Pliny. With respect to the latter writer, this is very doubtful. In the eleventh book (cap. xv.) he alludes to an animal called *strepsiceros*, with horns erect, lyre-shaped, pointed, and wound round by a spiral wreath of *rugæ*; this animal, he adds, is called *addax* in Africa, and is doubtless an antelope. Buffon, in the third volume of the supplement to his work; gives a figure of the male and female of this curious race, from a drawing sent him by Mr. Collinson, of London, from whom he was in the habit of receiving many communications; but he

obtained no information connected with their history.

The sheep of Greece are said still to retain no little portion of their original excellence : their head is large, the countenance lively, the back broad, the chest round, the legs small, the wool thick, soft, and much curled. They form an important part of the wealth of the natives of the mountain districts, but are not well managed in an agricultural point of view. Cheese is made to some extent from their milk ; and at Easter there is a great consumption of the lambs among the followers of the Greek church, at which time they sell for from four to six piastres each, or from about three to five shillings of our money. In some of the Greek Islands, and especially in Cyprus, a coarse-woolled variety of the fat-tailed race prevails, having four horns, of which the two middle are nearly erect, the lateral being variously curved.

In ancient times Italy was celebrated for the fineness of the wool produced in several of its districts, especially Apulia (to the south of Naples), the banks of the Po, and Lombardy ; the care bestowed upon the improvement of this material was proportionate to the desire of rendering the fabrics of the loom (for woollen fabrics constituted the clothing of the Romans) as beautiful and delicate in their texture as possible. Hence the sheep were often clad in order to improve the fleece, and hence the attention of the shepherd to his charge was unremitting. Virgil gives exact directions in the Georgics as to the treatment of the flocks both of sheep and goats, while he has thrown a sort of charm about the shepherd's life, which has more of poetry in it than of sober truth. The Roman poet's directions may be summed up as follows :—During winter the flocks are to be kept in warm stalls, with a good bedding of straw or fern, lest the frost injure them, and bring on scabies and

diseased feet. On the return of spring they are to be sent into the pasture-grounds; there, "while the morning is new, while the grass is hoary, and the dew, most grateful to cattle, lies on the tender herbage," they are to feed till the fourth hour of day, when they are to be led to the watering-troughs. In the noon-tide heat they are to repose in some shady place; in the evening they are again to feed and have drink. The practice of leading the flock to some retired and shady spot, in which to rest during the heat of mid-day, was a universal custom in the warm climates of Italy and Syria. To this custom also we find an allusion in Solomon's Song—"Tell me, O thou whom my soul loveth, where thou feedest, where thou makest thy flock to rest at noon." With the fall of the Roman Empire, and the irruption of barbarian tribes into Italy, the breeds so much valued became lost or mingled with inferior races. In Piedmont, indeed; the fine race described by Pliny long continued to preserve its old reputation; but of late the Alpine region of Italy has received importations from various countries, and among them flocks of the Merino breed, insomuch that nowhere can the pure relics of an ancient stock be found. In different parts of the Alps the sheep are more or less numerous, and of more or less value, according to the mountainous character of the country and the quality of the pasturage. In Savoy the necessity of housing the sheep in winter, and the difficulty of providing them with food during that season of the year, tend to circumscribe their numbers; and the few that are kept by the peasants are maintained for the sake of their wool. A gentleman has favoured us with the following statement from personal observation. He writes—

"In the mountains of Savoy, although the soft sound of the sheep-bell is often heard, there are no

large flocks, as it is absolutely necessary to keep them housed during the severe winter season, and as scarcely any of the peasantry or farmers have the means of thus sheltering them on a large scale.

“There are of course exceptions near the city of Chamberi, and in some other places, but, generally speaking, the Savoyard peasant possesses a small piece of ground capable of cultivation, on which he raises potatoes (now their principal food) in quantity sufficient for his family. The rest of his wealth consists of a few sheep and goats, a cow, or perhaps two or three cows, and an ass. The cows and the goats give their milk, the sheep their wool (of which the primitive clothing of the Savoyards is chiefly made), and the ass serves to bring home the dried leaves of autumn, the winter food of the sheep and goats, to carry wood for fuel, and to do sundry other useful duties. A pig or two are sometimes added to these possessions. The interior of a Savoyard cabin, where most of these domestic animals are frequently found lodged as forming part of the family, presents a curious scene to the stranger. The writer of this had once the fortune to pass a night in such a dwelling. On returning home from an excursion in the neighbouring mountains he felt himself so fatigued, and the night was so advanced, that, instead of going on to Lanslebourg at the foot of Mont Cenis, where, at that time (1819), there was a tolerably comfortable inn kept by an Englishwoman, he accepted the invitation of some peasants, who had been his guides and only companions, to stop short at their abode at Lanslevillard, a small village not far from Lanslebourg. He had found the poor fellows civil and obliging, active and sufficiently intelligent; and was also glad to see more of them and their way of living. A path, scarcely discernible through the snow which had fallen (the season was November), led to a

group of low cottages, central among which was the residence of his hosts, which seemed the most considerable of them. Before it there was a yard, shut in with hurdles and a gate, and on one side of it was a pig-sty (the pigs not having here the honour of the *entrée*), and on the other a low shed, joined to the cottage for warmth and comfort.

“Within the cottage was a tolerably large room, where, by a fire, rather small for the season, and which had its back towards the cow-shed, two women sat spinning with the distaff, and a little boy playing with a venerable-looking goat.

“The fire was speedily renewed, and an old cauldron put over it to cook the supper. This meal consisted of boiled potatoes, boiled milk, some slices of bread chopped from a loaf as hard as a millstone, and almost as big, but much darker in colour, and a few chestnuts, the last fruit being part of a valued hoard annually imported from the Italian country of Piedmont, on the other side of the Alps. They had no wine, beer, or spirit,—no liquids whatever, save water and milk; all their stores were produced for the stranger, and if a king had been their guest they could not have furnished another luxury. It was, however, more than enough to excite the appetite of a less hungry or more fastidious traveller, to see the zest with which the poor Savoyards partook of these goods. The supper, in honour of the guest, was, no doubt, to them one of unusual excellence.

“After many excuses had been made as to accommodations, a bundle of clean straw was carried into a small inner room. The bed or bed-place in this apartment was built against the wall like a berth on board ship, and still more like the dormitories used by the Scottish peasants, which recesses are shut up by daytime, or partially closed when the nights are very cold, after the fashion of presses or cupboards.

In this recess, after driving out of the room three or four sheep and a goat, the Savoyards laid the straw; over the straw they laid some sheep-skins, which, with the addition of an old grey cloth coat, were all the materials they could furnish as sheets, blankets, and coverlets.

"The bed, however, was sufficiently warm and comfortable, and the traveller slept very well, his only annoyance arising from a frolicsome young goat who did not like to be dispossessed of what was probably his usual quarters. This agile creature contrived to open the room-door, which was closed only by a wooden latch, and presently after jumped into the sleeping-place, where he amused himself by tugging the straw from beneath the stranger, and playing other tricks, until he was forcibly ejected, and the room-door secured by means of the iron point of the traveller's alpenstock.

"The *réveillée* in the morning was striking to the stranger: the cows lowed, as if they were close to his bed-head; the sheep bleated, the ass brayed, the goats capered, the pigs squeaked—all seemingly under the same roof. These creatures were calling for their breakfast.

"Nearly every part of the dress of a Savoyard peasant is produced from his own little flock. He dresses the wool himself, his wife or daughter spins it, and then the yarn is woven into cloth by the village weaver. The holiday coats are generally dyed blue, but those of every day wear are of less expensive colour. As they have plenty of black sheep in Savoy, they mix their wool with the wool of the white sheep, and, spinning them together, produce a sort of greyish brown cloth without the expense of dyeing. In another part of the Alps, the Grisons took their name from their custom of wearing grey cloth similarly manufactured.

‘As soon as the severity of winter is passed, the Savoyard turns out his cows and sheep, esteeming himself fortunate if his provision of hay for the cows, and dried leaves for the sheep, has sufficed for the time he has been obliged to keep them under his roof. At first they graze in the low valleys near the villages, where the snow first melts, and by degrees, as the verdure succeeds the wintery covering of the mountains, they ascend higher and higher. They are, however, almost invariably driven home for the night, even during the summer season. This duty falls to the women and girls, and few scenes can well be more soothing and pastoral than those which the traveller is almost sure to meet on approaching a small Savoyard town or village towards the sunset of a summer’s day. From all sides small flocks of sheep and goats, with a cow or two, and generally a few pigs, descend the hill-sides towards the homesteads, conducted by women and girls, who are always busily employed as they walk along, either in plating straw, or in knitting, or in spinning wool or flax with the distaff.’

Bakewell, alluding to the same scene, observes that, as the little flocks wind down the lower slopes of the mountains, followed by a young girl spinning with the distaff, a goat, cow, pig, or ass, also being one of the party, “they form the most picturesque groups for the pencil of the painter, and carry back the imagination to the ages of pastoral simplicity sung by the poets.” Picturesque groups for the pencil, however, are not always those which will bear the scrutiny of the judgment, and the term “pastoral simplicity” is “in speech an irony—in fact a fiction.”

One of the most singular races of sheep is the many-horned breed, originally from Iceland and the Feroe islands; sometimes the number of the horns

amounts to six or even eight—but four is the usual number—while, however, the sheep of Iceland are thus many-horned, the cattle, strange to say, are all polled (destitute of horns). Of these remarkable sheep several individuals are living in the gardens of the Zoological Society; they are large, strongly-built animals, with a coarse fleece, consisting of long hair externally, and an under layer of close wool.

Many are the casualties to which in their dreary country the sheep of Iceland are exposed, and hundreds yearly perish. Their destroyers are not merely the cold and the tempest, the eagle and the distemper; but the variety of accidents arising from frequent and tremendous volcanic eruptions are arrayed against them. In the year 1783 the flocks as well as the herds of the poor Icelanders were almost annihilated by the great eruption of Skaptaa Jokul. Yet in no place are sheep of more importance than in Iceland, or enter more frequently into domestic economy. They are milked—the milk is either drunk or made into cheese. Their flesh, when dried or salted, is a material part of their winter food, and an article of considerable exportation. Their wool is the material of almost every part of the Icelandic dress, and of their skins are made the fishing dresses of those hardy islanders, who smear them repeatedly with oil to keep out the water. The tenant of a farm pays his rent partly in wool and tallow. When butter is scarce sheep's tallow is the general substitute. The children are so fond of this substance, that they may be seen eating lumps of it, as though it were barley-sugar. One of the ways in which this simple people reward their parish priest is by keeping each of them a lamb for him, during the hard winter season, taking it under their care in October, and returning it to

the minister in good condition about the middle of May.

Here also, as in the sultry plains of Arabia, a sheep or a lamb is the usual tribute of hospitality, and the common present to the stranger and traveller.

Instead of being shorn, the wool is rudely pulled off from the skin,* and thus the Icelanders lose and spoil a great deal of the fleece, which is long, but not fine. As early as 1756 attempts were made to improve the quality of the wool by the introduction of Spanish rams. These attempts seem to have failed through the negligence of the islanders, but in 1808 they were renewed by a spirited individual who brought a few Merinos from Norway. When Sir George Stewart Mackenzie, to whom we are principally indebted for these details, was in Iceland in 1809-10, the first cross promised well.

In Iceland, as well as in Spain, the sheep pass the summer months on the mountain-pastures, and, though not quite so extensive, these periodical migrations are more primitive and picturesque than those of the Spanish *mestas*.

The gathering in of the flocks from the mountains at the approach of winter is indeed an important business.

When the hay-harvest is over, and the *hrepptioré* or parish officer thinks the farmers are ready, he com-

* It was the custom of the Romans thus to pull the fleece from the skins of the sheep, which custom was not altogether abolished even in the time of Pliny. The term *vellus* (fleece) is derived from the word *vellō* (to tear away), and the part of the Palatine hill called *Velleia* was the place in which the sheep originally underwent this operation. It was, however, the practice of the patriarchs to shear their sheep, and to wash them previously, as several passages in the scriptures abundantly prove.

municates with the sysselman of the district, who causes a notice to be proclaimed in the churches that on such a day the gathering of the sheep shall commence, and, at the same time, appoints a place of general meeting. Every farmer who has a considerable stock feeding on the highlands must send one man; but, if the number of his sheep be small, he may, for mutual convenience, join with another whose case is like his own, and send one man between him and his friend. When the men chosen for this service meet, they choose from among their number a shepherd who has had much experience. This sage they all agree to obey, and they give him for the time the title of "king," with the power of electing two associates as his counsellors.

The sheep-gatherers, accompanied by children, set off on horseback in very large parties, and contrive all to be on the appointed day at the spot selected near to the mountains. There they pitch their tents, and having dismounted and committed their horses to the care of the children, they await the orders of the "king," who, still on horseback, sends them off two by two, strictly enjoining them not to lose sight of their comrades.

When these men have collected as many sheep as they can find, they drive them towards the tents, and then shift their quarters.

Thus they proceed during a week, when they drive the sheep to an immense pen or fold, of which there are many in different parts of the country for the purpose. This pen is a large enclosure, surrounded by a number of smaller enclosures, in which the sheep of different proprietors are separated. This particular part of the business is quite a rural festival; but the gaiety is too often mingled with the lamentations of such as have lost many of their sheep. Those who now fail in recovering all their flock, repeat,

however, their search at the middle and again at the end of October, if the season is sufficiently clement.*

During the long night of winter that succeeds, an important occupation of the Icelandic women is to pick, clean, and spin the wool. The interior of one of their huts is seldom seen without a sheep-skin or two, destined to make fishing dresses for their husbands. These skins are prepared by being soaked in water till the wool loosens—they are then drawn over a ram's horn fastened to the roof of the hut by its ends. From the more recent travels of Dr. E. Henderson, we learn that every Icelandic farmer has a particular mark on the ears of his sheep, and that the smaller pens where the respective flocks are collected at the great annual gathering, are all built of lava erupted by the volcanoes of the island.

This traveller pleasantly describes the scene presented at one of these gatherings:—

“What with the bleating of numerous sheep, the noise made by the peasants in proving their property, and the appearance of the tents and pens which crowd the valley, this desert tract assumes on such occasions a most lively aspect, and furnishes a temporary relief from the silent monotony of Icelandic life.” †

Van Troil informs us that during bad weather the Icelandic sheep are very apt to hide themselves in caves. If no such retreat is near when a snow storm comes on, they place themselves all in a heap, with their noses towards the centre, and bent to the ground, which not only prevents them from being so easily buried, but facilitates the owners' finding them again. In this situation they can remain several days, but instances are not unfrequent, in which

* Travels in Iceland, by Sir G. S. Mackenzie.

† Iceland, or a Journal of a Residence in that Island, during the years 1814 and 1815.

they are induced by hunger to gnaw off each other's wool. The wool, it is said, forms into balls in their stomachs, and presently kills them.*

The greatest living enemy to which the Icelandic sheep are exposed, is the huge polar bear, which is frequently floated to the coasts of the island on detached masses of ice. The inhabitants use all possible care to prevent these hungry monsters from landing, but it is impossible to guard the whole of such extensive coasts, and wherever they do land, if there are any sheep exposed, they are almost certain to commit dreadful ravages. There are no wolves on the island, but the foxes are frequently dangerous to the lambs. It is said, however, that the sheep, when left to themselves, show considerable intelligence and some courage in defending their young, even against whole packs of foxes, who seldom succeed in making a prize except by stratagem.

The Orkney Islands present us with a wild, or rather neglected, breed of sheep, usually destitute of horns, but otherwise resembling those of Iceland, the Feroes, and the Shetland Islands.*

Low, in his Fauna of the Orkneys, gives an account of the operation of *rowing* which takes place about midsummer, on a particular day, "when all the men in the parish, attended by their dogs, turn out, and drive the whole flock, without any preparation of washing, into narrow pens, and from thence, I may say, to the place of execution, where the wool is torn (not shorn) off their backs; an operation which brings the whole blood into their skin, and is not only disgusting, but if the season grows harsh, is the cause of great destruction." A similar account is given also by Barry.

To enter into the various breeds of sheep peculiar

* Van Troil. Letters on Iceland.

to the various districts of Europe, would be an almost endless task; nor would it be in place in the present instance. There is one breed, however, so celebrated, and from which so much positive advantage has been derived, not only to Europe but to South Africa and Australia, as it respects the improvement of the character and qualities of wool, that we cannot omit to notice it—the more especially as the management of the flocks is peculiar, and deserves attention. It will be at once surmised that we allude to the Merino breed, for which Spain has long been famous, and which in the fineness and the felting property of the wool, no less than in the weight yielded by each individual, surpasses every other. Mr. Youatt in his admirable treatise on the sheep, speaking of those of Spain, observes that they are “divided into the *estantes* or stationary, and the *transhumantes* or migratory. The stationary sheep are those that remain during the whole of the year on a certain farm or in a certain district, there being a sufficient provision for them in winter and in summer. The transhumantes wander some hundreds of miles twice in the year in search of pasture. The stationary sheep consist of two breeds essentially different, and a third or intermediate one. The first is the *chunah* breed; it is altogether distinct from the Merinos, being larger, taller, and heavier, with the head smaller and devoid of wool. The staple of the wool of the body is eight inches long; it is much coarser than that of the Merino, and almost devoid of curve, and consequently of inferior value. This breed extends through almost the whole of Spain. It is the breed of the peasant and the little proprietor, and it is numerous even in those provinces where the Merinos are more extensively cultivated, and most perfect.” “The other principal breed of stationary consists of true

Merinos. They do not wander from the district or property on which they are bred. In form and fleece they differ not from the migratory sheep. They are found chiefly on the pastures scattered among the Guadarrama mountains, the Somo Sierra ranges, and the whole country of Segovia. They amount to about two millions. Besides these, and also stationary, and found in every part of Spain, are various mixed breeds, the produce of the Merinos and the chunahs, and other native varieties of sheep. Their character and value differ according to the proportion of Merino blood in them; and where that considerably preponderates they are often confounded with and substituted for the pure Merinos. The chunahs and the mixed breeds amount to six millions."

The transhumantes or migratory Merinos are, however, of all the Spanish breeds, the most celebrated and valuable, and the most sought after by other nations. Their number is calculated to be ten millions; and the whole mass, divided into flocks which are under the care of a mayoral or chief shepherd and assistants, migrate from the mountains of the north to the plains of the south in winter, and return back to the mountains in the summer. The flocks follow the shepherds, who lead the way, and direct the length and speed of the journey; a few wethers, perfectly tamed, tread in the footsteps of the conductor, and the rest follow in due order; a powerful breed of dogs accompany the shepherds, in order to defend the flock from wolves, and a few mules carry their provision and other necessaries, as well as materials for making up the fold at night.

This migratory system is regulated by a tribunal termed *Mesta*, which has been of old standing; it can be traced back to the middle of the fourteenth century, at which period, definite laws with respect

to it were enacted, by which persons were prohibited from travelling along the course of the route pursued by the flocks, while the sheep were in motion; it also established a right to graze on all the open and common land that lay in the way; and moreover it claimed a path ninety yards wide, through all the enclosed and cultivated country. The journey taken by the Merino flocks, is upwards of four hundred miles, which they accomplish in six or seven weeks, and the same time is spent in retracing the route, so that in every year, about fourteen weeks (or nearly a quarter) are spent in these toilsome journeys. Popular prejudice in Spain attributes the superiority of the Merino wool to this practice,—a practice injurious to the agriculturist, through whose cornlands and vineyards the flocks pass, and injurious to the keepers of stationary sheep, inasmuch as the common and pasture lands are completely eaten bare by the multitudes that slowly pass over them, while wilfully, or through carelessness, serious damage is done to farms, plantations, fields, and vineyards, for which no redress can be obtained.

But does the Merino wool, as the Spaniards assert, owe its superiority to the above-mentioned cause? This is much to be doubted; the stationary Merinos in Leon and Estremadura produce wool equal in quality to that of the migratory flocks, and these are exceeded by some of the German Merinos which never travel; so that at least the advantages of the Mesta system have been overrated,—while the evils resulting to the flocks from fatigue, and the injury done to the lands in their course, have been treated with indifference.

With respect to the origin of the Merino breed, there is much room for speculation. It is, we believe, generally supposed that they were originally obtained from England, and were either of the Ryland or Cotswold stock.

Stow and Baker in their Chronicles say, "This yere (1464) King Edward IV. gave a licence to pass over certain Cotteswolde sheep into Spain." Baker adds, "King Edward IV. enters into a league with John King of Arragon, to whom he sent a score of Costal ewes and four rams." The word *Merino* alludes to the oversea origin of the race in question. Whatever the sheep were which were thus exported into Spain from England, certain it is that the race has there improved. Shakspeare says "every eleventh wether tods," which makes each fleece about two pounds and a half, whereas the average weight of the fleece of a Merino ram is eight pounds, and five that of the ewe. The fleece of our own breeds has also materially improved both in weight and quality since the time of Shakspeare.

We shall here introduce an abridgment from 'Dillon's Travels in Spain,' of a most interesting and valuable account of the Merinos and the Spanish Mesta, in which the subject is fully treated. This account, which was also inserted in the 'Gentleman's Magazine' in 1764, and in several other publications, appears to have been written by Mr. William Bowles, an English gentleman who was in the Spanish service for many years, during which he devoted himself with much ardour to the natural history and productions of Spain:—

The Merino flocks, after spending the summer in the northern mountains, descend in the winter to the milder provinces of Estremadura and Andalusia, where they are distributed into districts called *merindades*. Each flock, consisting generally of about 10,000 sheep, has a *mayoral*, or head shepherd, who is chosen as an active, experienced man, well acquainted with the nature of pastures, and the different diseases to which sheep are liable. This chief has under him fifty shepherds, each of whom is furnished

with a good dog. Though these immense flocks divide and separate, the management of them all as similar and uniform, being such as long experience has dictated.

These sheep are seen in the greatest numbers in the Montaña and Molina de Aragón in the summer, and in Estremadura during the winter. Estremadura abounds with aromatic plants, but the Montaña, the most elevated part of Spain, produces scarcely any.

When they reach the spots among the mountains where they are to spend the summer, the shepherd's first care is to give the ewes of the flock as much salt as they will eat. Fifty or sixty flat stones are arranged at the distance of about five steps the one from the other; the shepherd strews salt upon each of these stones, then leads his flock slowly through the stones, allowing the sheep to eat at pleasure. This is frequently repeated, taking care not to let them feed on those days on any spot where there is limestone; but driving them to pastures growing over an argillaceous soil, where, from the cravings they have acquired, they devour everything they meet with, after which they return to the salt with renewed ardour.

At the end of July each shepherd distributes the rams, in proportion of five or six rams to a hundred ewes. Previously to this they are carefully kept apart, and they are again separated at a proper season. "About the middle of September they are marked, which is done by rubbing their loins with ochre diluted in water; some say this earth incorporates with the grease of the wool, and forms a kind of varnish, which protects them from the inclemency of the weather; others pretend that the pressure of the ochre keeps the wool short, and prevents it from becoming of an ordinary quality; others again

imagine that the ochre acts as an absorbent, sucking up the excess of transpiration, which would render the wool ordinary and coarse."

Towards the end of September the Merinos begin to leave the mountains for the warmer climate of the plains. The route they take has been regulated by customs and laws from time immemorial. Where cultivated lands occur on their road, the inhabitants are obliged to leave a passage for them of the width of ninety paces; and here the flocks are made to travel fast, going, it is said, as far as six or seven leagues in the course of twenty-four hours. In open places they seldom exceed two leagues a-day, following their shepherds and grazing as they go.

On reaching the plains the shepherd's care is to lead them to the very same pastures where they have been the winter before, and where the greater part of them were yeaned: this is a task of no difficulty, for their own instinct makes the sheep discover those spots and take possession; nor will they quit them save by constraint.

Folds, made of stakes driven in the ground, and with ropes, are then prepared for them, to prevent their escaping and being devoured by wolves. The intelligent dogs are stationed without the folds. The shepherds build themselves huts with stakes and boughs, for which, and for fuel, an old law allows them to cut off one branch from every tree. In the month of March they have four operations to perform on the lambs yeaned in the season:—1st, to cut off their tails (for cleanliness) five inches below the rump; 2nd, to mark them on the nose with a hot iron; 3rd, to saw off the tips of their horns, that they may not hurt one another at play; 4th, to castrate such lambs as are intended for bell-wethers to walk at the head of the tribe.

In April the proper time is arrived for their return

to the mountains, and this the flocks themselves express, by various movements, eagerness and restlessness. The shepherd's must now be very active and watchful, or whole flocks will decamp of themselves, and take the straightest road back to the places whence they came.

On the 1st of May, unless the weather be unfavourable, the sheep-shearing commences. The greatest care is taken to avoid humidity, for the fleeces, as they are sheared being piled one above another, would ferment in case of dampness in them, and rot. The sheep are therefore sheared in covered places. Some of these enclosures will contain as many as 20,000 sheep, and the ewes are kept in them for some time after shearing:—so delicate are they that they would inevitably perish if exposed to the chilling mountain air during night.

Each man is generally reckoned as capable of shearing from seven to eight sheep a-day, but if rams, only four or five, on account of their superior bulk, and the greater difficulty of keeping them quiet. The rams afford wool in greater quantity than the ewes, but in quality it is not near so fine. Immediately before shearing, the sheep are confined in a narrow place—a sudatory—where they are kept as close as possible, in order that they may perspire freely, and that the wool (which in the males is apt to be very stubborn) may be softened. The fleece, as it is shorn, is divided into three sorts, that are carefully kept apart.

The back and belly give the superfine; the neck and sides the fine; the breast, shoulders, and thighs the coarse.

The sheep are never suffered to move out of their folds, till the morning sun has exhaled the night dews. They are never permitted to drink at brooks or stagnant waters where hail has fallen—experience having

shown that such waters are highly pernicious to them.

If the sheep are left to graze at leisure, it is found that they invariably prefer the finest grasses, never touching the aromatic plants; and that if the wild thyme and such herbs be entangled with the grass, they will separate them with great dexterity. But if interrupted, as happens when the shepherds on a likelihood of rain make signal to the dogs to collect and drive the flocks to shelter, in their hurry the sheep will devour everything—even poisonous plants.

Such are the main points of the treatment of the celebrated Merino flocks, the excellence of which, no doubt, principally depends on the periodical changes of climate, by which they avoid extremity of heat, and extremity of cold, both of which (and more especially the first) are prejudicial to sheep.

In the provinces of Andalusia and Estremadura, where the Merinos pass the winter, there are other flocks which are not driven to the mountains for the summer, and whose fleece has none of the excellence of that of the Merinos. The Merinos themselves, if left in the low country, speedily degenerate. Were they exposed on the mountains all the year round, they would do the same, and moreover frequently perish from cold, snow-storms, and other casualties; while in the plains, dried up by the scorching sun of summer, they would be exposed to drought and famine, and never could exist in such numbers as they do.

An effect, however, incident to this system is, that immense tracts of country in Spain are never touched by the agriculturist, but remain age after age mere sheep-walks. This has been felt as a serious evil, and several Spanish writers have employed both argument and invective against the system. Among them Padre Sarmiento is conspicuous.

The monk attributes its origin to a great national calamity—he holds it as a curse springing out of a curse. He is angry at the very appellation of *mesta*, which, he says, has corruptly crept into the Spanish language, where its proper signification is “a mixture of grain and seed, such as barley, beans, oats, lentils, &c.” He affirms that the English sheep were first introduced into the mountains of Segovia, without any contemplation of the *mesta*, or any annual migration to Estremadura. But that shortly after, (from 1348 to 1350) Spain was sadly depopulated by the plague, and then, “it was the great space of uncultivated land, and the want of husbandmen, that encouraged both shepherds and cattle to stray beyond their boundaries, and to wander into districts where no impediments occurred to their progress; making a casual use of the land without the least thought of proper cultivation, as this would require more hands than they were able to furnish.”

He then applauds a law made by Ferdinand King of Portugal—“That no person who was not a husbandman, or his servant, should keep sheep either for himself or others; and if any persons were desirous of keeping them, they must oblige themselves to cultivate a certain portion of land, under penalty of forfeiting their flocks and cattle, in case this regulation was not exactly complied with.”

This is not the place to discuss the points of political economy involved in this question, but we may permit ourselves a few brief remarks. When the monk states that where there is *no mesta* there is population, and where there *is* the *mesta*, there is *no population*, he ought to have remembered that (even according to his own showing) the depopulation had not arisen from the *mesta*, but the *mesta* from the depopulation. Had Spain been blessed by a wiser government, and circumstances more favourable than

those that have fallen to her lot, population, which neither the mesta nor any conventional system of the sort can prevent or retard, might have increased much more than it has, and the agriculturist might have found it to his interest to reclaim part of those vast sheep-walks.

But a very considerable portion of the great flats of Estremadura, of Andalusia, and other districts of southern Spain, are naturally arid and sterile, without water, without trees to retain and attract moisture—partially covered with green herbage in the winter, and in the summer, brown, burnt-up deserts, not much unlike those of Africa. As these *are*, they are valuable pastoral adjuncts to the mountains; but an entire change of circumstances must arise to render the planting of trees, irrigation, and other long and expensive processes absolutely indispensable, speculations likely to be attended with profit. And again, the bleak elevations of the Montana and Molina de Aragon present insuperable obstacles to agriculture; whilst for the summer season they are among the best pastures in Europe, and capable of supporting flocks and herds innumerable; but, as we have already stated, if the sheep were exposed on those mountains during winter, their wool would be deteriorated, and their numbers fearfully diminished. At that season they require the milder atmosphere of the plains. Take away the low country, and you render comparatively useless the high; so that a gain on the one hand (supposing those plains to be profitably cultivated) is met with a loss on the other.

Precisely the same is the case in several parts of Italy, particularly in the kingdom of Naples, where the mountain range of the Syla and the plains of Calabria, the highlands of the Abruzzi and Basilicata, and the wide flats of Apulia, alternate with and aid each other in a pastoral sense.

For ages the superiority of the wool of the Merino flocks of Spain was acknowledged all over Europe, without any country or individuals suggesting the idea of improving their native breeds by crossing them with the Spanish race. England, France, Germany, and all the continental states where the manufacture of fine cloth was carried on or attempted, imported the wool from Spain, and never entertained the hope of rendering by progressive improvement, the hard, coarse, and every way inferior fleece of their own flocks available for this purpose.

It was in the cold and bleak climate of Sweden that the attempt was first made to naturalise the sheep of Spain, and to breed from them for the general improvement of the Swedish stock.* That country, judging from its physical circumstances, would have seemed the last and not the first likely to make such an experiment; but the Swedes had paid particular attention to the studies of natural history, and therefore they took precedence of all other nations, who, indeed, long after, persisted in holding as impossible what had been proved by successful experiment to be quite easy. Those who can see only a trifling amusement in the pursuits of the naturalist will do well to remember this fact, and the great practical utility that resulted to Sweden from the cultivation of natural history. The original breed of Swedish sheep was miserably bad. The first steps taken to improve it, was to import some English and German sheep. This was done in 1715, and as early as 1723

* The authorities for the remainder of this section are 'Laysterie's Account of the Introduction of Merino Sheep into the different States of Europe, and at the Cape of Good Hope. Translated, and with Notes by Benjamin Thompson.' 'R. Bakewell's Observations on the Influence of Soil and Climate, upon Wool, &c. ;' and some pamphlets by Nehemiah Bartley.

the Swedish government introduced a flock of Merinos, from which a very fine race was procured. This was effected by skilfully adopting a mode of treatment suited to the different soil and climate, and by unwearied care and attention. Wherever these were neglected, the cross-breed speedily deteriorated. To dispel popular ignorance and prejudice against the foreign stock, which still obtained in some parts of the country, in 1739 the Swedish government established a school for shepherds, and granted premiums to all such as by judicious crossing and attention improved their breed of sheep. By 1764, Sweden had 65,369 pure Merinos, and 23,384 of a good mixed breed, improved not only in quality of fleece, but also of flesh.

Saxony was the first country that, after an interval of many years, followed the example of Sweden. The reigning Saxony Elector, anxious to repair the devastations committed in his dominions during the seven years' war, obtained from the King of Spain, in 1765, 100 Merino lambs and 200 ewes, selected from the best flocks in Spain. After a lapse of ten years, it was perceived that the pure Spanish race had preserved its original properties, and that animals were to be found of several crosses by the Merino ram, which had acquired a fleece, yielding to that of Spain neither in fineness nor beauty. In 1809, Saxony reared about 1,600,000 sheep of all kinds, and could boast of 90,000, partly of the pure Merino race, and partly of improvement produced by crosses of that breed. Immense advantages accrued to the country by these means. With improved materials, the woollen manufactories rose in reputation, and Saxony wool in its raw state rivalled that of Spain in the market.

Frederick the Great of Prussia had other qualities in addition to those of the great warrior. He turned

his attention to the improvement of the agriculture of his country, devoting to that purpose, between the years 1763 and 1778, forty millions of dollars, with the labour procured by which vast tracts of land, before sterile or marshy, were converted into corn-fields and rich pastures. Before this period, or in 1756, an intelligent Prussian had made the first essay in improving the breed of sheep by introducing some of the Silesian flock, whose wool was superior. Twelve years after, the same individual contrived to buy a few of the new breed in Saxony, or, as they were called, Saxo-merino sheep, and in 1778, he imported a certain number of Merinos from Spain direct. From these importations, properly managed and crossed, Prussia was soon in possession of large and beautiful flocks. Schools for shepherds, where a certain number of men were admitted annually to learn the practice of their art, were also established.

In 1786, the great Frederick himself imported from Spain 100 rams and 200 ewes; and some years after, the meritorious individual, to whom allusion has already been several times made, went from Prussia to Estremadura to obtain a still greater supply.

In Austria similar attempts were made at improvement in 1775, when the empress Maria Theresa imported from Spain 300 Merinos, which were placed on an imperial farm in Hungary, where a school for farmers was instituted. From this seminary printed instructions were issued as to the treatment of fine-woolled sheep, and the proper modes by which perfection might be obtained through them. Shepherds properly instructed were also sent from the imperial establishment to such farmers as required their services. Several subsequent importations of Merinos have been made by Austria from Spain.

About 1780, the small German states of Anspach

and Bayreuth also established schools for shepherds, and imported 40 rams and a few ewes, principally of the Saxo-merino breed. Ten years later, they made an importation from Spain direct.

In 1786, the Duke of Wurtemberg bought a small flock in Spain. These poor creatures had to travel all the way by land, and nine out of sixty-five were lost on the long journey through France, Savoy, and Switzerland. In the revolutionary war, a few years after this importation, the provisional government of Wurtemberg, on the conclusion of an armistice, gave to the French general Moreau, as a highly valuable present, thirty-two Merinos of their breed. These sheep the general presented to the Agricultural Society of Strasburg. Merinos have also been introduced into Hanover, Mecklenburg, and many other parts of Germany, where they have equally prospered.

In the north, Denmark was tardy in following the example of her neighbour Sweden; but, in 1797, the Danish government procured from Spain three hundred Merinos, which did very well on the farm of Esserum, eight leagues from Copenhagen.

In France, the great minister, Colbert, was the first who turned his attention to this important subject, and formed the design of introducing English and Spanish sheep. "His views," says M. Laysterie, "were useful, and founded on well-digested consideration; but they were also new, and, of course, therefore, they met with opposition. About the middle of the last century, some Merinos were first imported from Spain, and their introduction into France was attended by very happy results. This fact gradually excited public attention; and as farmers saw in the evidence of perfect success that their former notions and prejudices were absurd, they began to wish for the means of improving their flocks by the introduc-

tion of the foreign sheep. From the time that this conviction became pretty general, the amelioration of the French breed was pursued with increasing energy; but it was not until some years after, that M. Daubenton, a gentleman who applied a long and laborious life to the subject, was enabled to secure the means for this great improvement. An excellent treatise he published, entitled, 'Instructions to Shepherds and Owners of Flocks,' essentially contributed to the desired end, and he had the good fortune to be employed by the French government to realize his own schemes. In 1766, M. Trudaine, Intendant of Finance, seeing that Spain, who had hitherto contented herself with the profit derived from the raw material she exported, now began to establish cloth manufactories of her own, apprehended that as soon as those Spanish manufactories were sufficiently extended, the exportation of Spanish wool would be prohibited. Now without this foreign supply of material, or a great improvement in the quality of her native fleeces, France must lose the advantage accruing to her from her manufactures of fine cloths, &c.

The minister's fears as to Spain becoming a great manufacturing country, under the circumstances, were, perhaps, chimerical, but they proved highly beneficial to his country. M. Daubenton, who had made many experiments, and who was of opinion that the climate of France was more favourable to the production of fine wool than either that of Spain, or that of England, being without the excessive heats of the one and the fogs of the other, was consulted, and then intrusted with the greater part of the important business. The French government successively procured rams and ewes from Roussillon, Flanders, England, Morocco, Thibet, and Spain. These were placed on an extensive farm at Bour-

gogne, near Montbar, the favourite residence of the great naturalist Buffon, and the birth-place of Daubenton. This particular district, being somewhat mountainous, was considered by Daubenton as favourable to the production of fine wool. There were no cots or any other places of refuge erected for these sheep of many countries, but they were kept in the open air all the year round. They succeeded wonderfully, and, subsequently, they and their produce being spread over different parts of France, and crossed with the French breed, did well wherever the proper care recommended by Daubenton was taken of them. A royal sheep farm at Rambouillet, where, we believe, the Merino stock predominated, became particularly famous. By these means, and when some lingering prejudices on the part of the manufacturers had been overcome, French wool was produced, which commanded as high a market price as the best Spanish.

In 1796-7, the Directory of the French republic, being desirous of still further improvement, resolved to import annually from Spain one hundred rams and one thousand ewes, of the pure Merino breed, for the space of five years, having provided for the faculty of so doing by a secret article in the treaty of Bâle. The course of political events, however, interfered with this plan; Spain repented of the permission granted, and of rams and ewes only about two thousand reached France. At a later period, when Buonapartè so unjustly took possession of Spain, some Merino flocks were among the plunder sent into France.

England was among the last of the countries of Europe to attempt the amelioration of her native flocks, by crossing them with the Merino breed. This tardiness arose, naturally enough, from the comparative excellence of her own breeds of sheep.

English wool had been for ages the staple commodity of the nation—it had stood unrivalled by our neighbours, and the meat of our sheep was as good as the fleece. But when there is a prospect of making good better, surely the attempt ought to be made, and the opposition to all such experiments is anything rather than honourable to our fathers. In no country, indeed, were greater difficulties encountered from ignorance and prejudice. It was obstinately maintained that Merinos imported would degenerate, for want of Spanish climate, Spanish pasturage, and the annual journeys to which they were accustomed in their own country; and then it was asserted, with equal pertinacity, that any improvement which might be effected by the introduction of Merinos in the quality of our wool, would be met with a consequent deterioration in the quality of our mutton. It was in vain to refer to what had occurred in the infinitely ruder climates of Sweden, Denmark, and Norway. The merit of removing these prejudices is due to that eminent naturalist, the late Sir Joseph Banks, who, in the first place, convinced George III. that they were unfounded. Consequently, the king himself became the first importer, and the first Merinos brought into England, in 1787, went by the name of “The king’s fine-woolled Spanish sheep.” The Marchioness Del Campo di Alange presented to George III. five rams and thirty-five ewes of her own flock, which was known by the name of “Negretti,” and was the best in Spain; in return, his Majesty sent the marchioness eight fine English coach-horses.

The king gave away some of the progeny of these Spanish sheep, and afterwards permitted that a certain number should be sold publicly for more general improvement. The business of this sale, &c., was intrusted to Sir Joseph Banks.

• Subsequently the Duke of Bedford and other landed proprietors and experimentalists imported Merinos. The late Dr. Parry was particularly successful in producing a fine cross between the Spanish and our Ryland breeds. Meanwhile, the publications of Lord Somerville, the enlightened president of the Board of Agriculture; of Mr. Bakewell, the author of 'Observations on the Influence of Soil and Climate upon Wool, with Hints for the Management of Sheep,' and the writings and experiments of other gentlemen, tended to remove what prejudices might yet remain in this country.

If we were late in adopting the Merino breed ourselves, we have, however, the merit of introducing it in two distant and important parts of the globe—the Cape of Good Hope and New South Wales—in both of which it flourishes exceedingly well.

According to Mr. Dawson, the intelligent manager of the Australian Agricultural Company, sheep, in common with all other animals, increase in size in New South Wales, where both the climate and soil appear by nature intended to produce fine wool and fine animals, even from the worst beginnings. "The extensive range that can be afforded to every animal," says the same gentleman, "keeps it in good condition, and perhaps the native grasses may have more of good in them than their appearance indicates. However this may be, the climate clearly has a wonderful effect on the size of all animals, even upon man, who is almost universally tall here, although born of diminutive parents. From this I am led to believe that the climate governs chiefly, and thus every breeding animal introduced here will attain a size not known in Europe."

To the different European countries we have enumerated as having adopted Spanish sheep, must be added Holland, Norway, and even Iceland. A few

Merino rams have also been introduced into Italy, and successfully crossed with Roman, Neapolitan, and Paduan ewes. We may therefore conclude with M. Laysterie, that "The preservation of the Merino race in its utmost purity at the Cape of Good Hope, in the marshes of Holland, and under the rigorous climate of Sweden, proves that fine-woolled sheep may be kept wherever industrious men and intelligent breeders exist."

There is, however, an important limitation to this. Though sheep are not seen to degenerate under the effects of the cold climate of Sweden, they certainly do so, and that rapidly, when exposed to great heat. In some parts of Africa the sheep can scarcely be said to bear wool at all, and Mr. Bakewell informs us that two fine ewes sent to St. Domingo, soon after their arrival became languid and sickly—they lost all their wool, which in twelve months was succeeded by a harsh, wiry, spare crop of hair.

Before quitting this part of the subject, the names ought to be recorded of those intelligent and patriotic individuals who first turned their attention to the improvement of their native flocks by the introduction of Spanish and other foreign sheep. These men were better entitled to the admiration and gratitude of their country, than were many by whose fame theirs is eclipsed.

They were—Alstroemer, in Sweden; Koenig, in Saxony; Fink, in Prussia; Magnis, in Silesia; Twint, in Holland; and Nelson, in Denmark. For France and England, we have mentioned M. Daubenton, and Sir Joseph Banks.

CHAPTER X.

THE GOAT.—*Capra Hircus*, LINN.*Common English Goat.*

NUMEROUS as are the varieties into which the goat has ramified, they are less multiplied than those of the sheep, and also less removed from each other;—facts which seem to prove either that the goat is less susceptible of modification by the united agencies of domestication, food, and climate,—or that it has never been so completely domesticated,—so subdued in its nature as the sheep. In its temper it is bold, confident, inquisitive, and capricious; it acts for

itself; it is not blindly led by its companions, and it knows how to resist the attacks of an adversary with vigour. It is fond of the society of man, and becomes playful and affectionate, courting his notice, and, if encouraged, engaging in mimic combat. Its climbing propensities are irrepressible—we see it mount on palings, on the eaves of houses, on ledges of any kind, where it would scarcely be thought capable of finding foot-room; in fact, its predilection for the precipices and bold rocks, among which all the species of ibex delight to dwell, remains unbroken by servitude. Hence its adaptation for mountain districts, in which it thrives; and its utility to the natives of such provinces of Europe; provinces in which it takes the place of the cow and the sheep, the milk of the females and the flesh of the young being equally acceptable. It is indeed peculiarly active, hardy, and powerful, and will live upon the scanty herbage of the highest ranges, visiting the borders even of the line of snow, in quest of the vegetation which the transient summer calls forth;—hence the importance of the goat on the Alps, where it is kept in flocks of considerable extent, among which may be sometimes observed, it is said, a domesticated ibex; an animal formerly common in the Alps, but now very rare, and only to be seen wild in the remotest solitudes. Naturalists, it would appear, almost universally refer the origin of our domestic goat to the Paseng of Persia, the *Ægagre* (*Capra Ægagrus*, Gmel.), an animal which inhabits the mountains of that country in herds, and the mountain ranges of other districts of Asia,—and perhaps also of eastern Europe. In size it is superior to our ordinary domestic race; the chaffron is black; the sides of the cheeks reddish; and the chin is ornamented with a long beard of brown colour: the general tint of the body is rusty grey, the upper surface of the tail and the dorsal line being

*The Pashang.*

black; the horns in the male are of large size, arched boldly backwards, compressed, obscurely marked with protuberant transverse knots, and acutely ridged anteriorly,—their posterior surface being rounded. In the female they are short, and sometimes even wanting. Its manners resemble those of its relative, the ibex of Europe; it tenants the most elevated pinnacles, and displays astonishing strength and activity.

Without attempting to settle from which of the species of ibex,—whether the paseng, or another,—or whether from more than one primitive source (for more than one species breeds freely with the goat)—the domestic races of this animal have originated, we may observe that its subjugation appears to have taken place as early, or nearly so, as that of the sheep;—it is probable that Abel was a “keeper” of goats, as well as of sheep, though we do not find the animal expressly mentioned until after the Noahic deluge, when (Genesis, ch. xv. 9,) Abram is commanded to sacrifice “a heifer of three years old, and a she-goat of three years old, and a ram of three years old, and a turtle-dove and a young pigeon.” In Genesis, ch. xxvii., we find the flesh of the kid eaten as a delicacy; and indeed not distinguished from venison or the flesh of the fawn; for it was this which Isaac asked Esau to procure in the field with his “quiver” and his “bow;” but in the place of which he partook of the flesh of the kids killed by Jacob. From other passages, with which our readers are familiar, it is evident that the flesh of the kid was accounted a delicacy; while both the kid and the goat were among the list of animals offered in the Jewish sacrifices. From other passages it would appear that the goat in ancient times, at least in Syria, had fine long hair, probably like the Angora race of the present day, fit for spinning and being ultimately manufactured into cloth. Among the valuable contributions demanded of the Israelites for making the tabernacle (Exod. xxv.), are “gold, silver, and brass, and blue, and purple, and scarlet, and fine linen, and goats’ hair.” Again (Exod. xxvi. 7.), “And thou shalt make curtains of goats’ hair, to be a covering upon the tabernacle.” We are further informed (ch. xxxv.) that “every man with whom was found blue, and purple, and scarlet,

and fine linen, and goats' hair, &c., brought them," "and all the women, whose hearts stirred them up in wisdom, spun goats' hair." The curtains of goats' hair, eleven in number, were, as we afterwards learn, each thirty cubits in length, and four in breadth; a proof that the manufacture of cloth from this material was well understood. The hair of the goats of Italy, in Virgil's time, appear to have had long hair, but of a coarse quality. In the Georgics (lib. iii. l. 311). the shepherds are directed to shear the beards and hoary chins and long hair of the Cinyphian goat for the service of the camp, and for garments for the mariner. Varro also observes that goats were shorn for the use of sailors, for coverings to engines of war, as moving turrets, &c., and for workmen's instruments.

The observations made with respect to the sheep as affording milk, applies with equal force to the goat. From the earliest antiquity, the milk of the goat has been in requisition; and, in the present day, the goat and sheep take in Syria the place of the cow. In Switzerland, flocks of goats are kept for the sake of their milk, the lines of Virgil being still as applicable now as in his day.

"Pascuntur vero silvas, et summa Lycæi,
Horrentesque rubos, et amantes ardua dumos;
Atque ipsæ memores redeunt in tecta, suosque
Ducunt, et gravido superant vix ubere limen."—

*Virg. Georg. Lib. iii. **

It is from the milk of the ewe, and also of the goat, or rather both mixed, that the celebrated cheese

* On shrubs they browse, and on the bleaky top
Of rugged hills the thorny bramble crop;
Attended with their bleating kids they come,
At night, unask'd, and mindful of their home,
And scarce their swelling bags the threshold overcome.

Dryden's Trans.

of Rochfort is produced. In Syria, butter and cheese are made from the milk of these animals, as is also the case in Switzerland. The following table is given by MM. Parmentier and Desyeux, as indicating the ratio of the several properties of the milk of our domestic animals :—

For Butter.	Cheese.	Sugar.	Whey.
1. Sheep	1. Goat	1. Ass	1. Ass
2. Cow	2. Sheep	2. Mare	2. Mare
3. Goat	3. Cow	3. Cow	3. Cow
4. Ass	4. Ass	4. Goat	4. Goat
5. Mare	5. Mare	5. Sheep	5. Sheep

So that, as it respects the production of cheese, the milk of the goat takes the lead—but being only third-rate as respects butter (in which that of the sheep excels), the cheese will be deficient in richness.

Buffon observes, that the milk of the goat is better than that of the sheep,—that it is used as medicine, curdles easily, and makes good cheese; but that, as it contains but few oily particles, the cream should never be separated from it. There is another point, also connected with the use of the milk of the goat, to which Buffon alludes,—namely, the rearing of infants upon it, the goats themselves acting the part of tender and affectionate nurses. In several parts of the continent this practice is very common. “It is ordinary all about where I live,” says Montaigne, “to see the countrywomen, when they want suck of their own, to call goats to their assistance. And I have at this hour two footmen that never sucked woman’s milk more than eight days after they were born. These goats are immediately taught to come and suckle the little children, well knowing their voices when they cry, and come running to them; when, if

any other (child) than that they are acquainted with be presented to them, they refuse to let it suck, and the child to any other goat will do the same: I saw one the other day, from whom they had taken away the goat that used to nourish it (by reason the father had only borrowed it of a neighbour), that would not touch any other they could bring, and, doubtless, died of hunger."—*Montaigne's Essays*—*Cotton's Translation*, 1711.

In Holland, the goat is employed in drawing small carts proportioned to its strength; nor is this practice unknown in England. Whoever has been to Brighton, and other towns of the like nature on our coast, cannot but have observed goats harnessed to light carriages for children, which they draw with patience and docility; indeed, the teachableness of the goat forms a very striking point of difference between it and the sheep:—curious, capricious, easily tamed, fond of engaging in mimic combat with those to whom it is accustomed, or even with the dogs of the house,—bold and restless, the goat at the same time is susceptible of a great degree of education, and may be taught actions and services which it would be vain to expect from the sheep.

In Egypt and Syria goats are often taught various feats of dexterity, for the performance of which their natural address and activity peculiarly qualify them; but to execute which, nevertheless, requires considerable practice. Dr. Clarke, in his *Travels* (vol. ii.), noticed an instance of this kind, which he describes as follows:—

“Upon our road we met an Arab with a goat, which he led about the country to exhibit, in order to gain a livelihood for itself and its owner. He had taught this animal, while he accompanied its movements with a song, to mount upon little cylindrical blocks of wood, placed successively one upon another,

and, in shape, resembling the dice-boxes belonging to a back-gammon table. In this manner, the goat stood first upon the top of one cylinder, then upon the top of two, and afterwards upon three, four, five, and six, until it remained balanced upon the summit of them all, elevated several feet above the ground, and with its four feet collected upon a single point without throwing down the disjointed fabric upon which it stood. The practice is very ancient. It is also noticed by Sandys. Nothing can show more fully the tenacious footing possessed by this quadruped upon the jutting points and crags of rocks; and the circumstance of its ability to remain thus poised may render its appearance less surprising, as it is sometimes seen in the Alps, and in all mountainous countries, with hardly any place for its feet, upon the sides and by the brink of most tremendous precipices. The diameter of the upper cylinder on



Dexterity of a Goat.

which its four feet ultimately remained until the Arab had ended his ditty was only two inches. The most curious part of the performance occurred afterwards; for the Arab, to convince us of the animal's attention to the turn of the air, interrupted the *da capo*; as often as he did this the goat tottered, appeared uneasy, and, upon his becoming suddenly silent in the middle of his song, it fell to the ground."

We need not say that the goat, like the sheep, is almost universally spread throughout the world; it exists, indeed, in places destitute both of the sheep, ox, and horse,—places to which, at some time or other, it has certainly been carried by man. We may instance the island of Juan Fernandez, on which Alexander Selkirk resided for some years, and which in his time was abundantly stocked with goats; their flesh supplied him with food, and he often captured more than were requisite for his wants. Thirty-two years after the time of Selkirk this island was visited by Captain G. Anson, whose account of it is exceedingly interesting. It will be found in 'Kerr's Collection of Voyages,' vol. xi.

The use of the goat in England, compared with other countries, is very limited: the demand for its milk is only occasional, and the flesh even of the kid is not in much request. Few stable-yards, however, are destitute of a goat or two, the peculiar odour of the animal (especially strong in the male) being supposed both grateful and salutary to horses. However this may be, the presence of the active, playful goat may not be unproductive of benefit, inasmuch as most animals, and the horse especially, delight in society; instances of close attraction between the goat and the horse are far from being uncommon. The skin of the goat is superior in its texture to that of the sheep, and is manufactured into a soft and beautiful leather. It is of goats' skins that the best morocco

leather is made, and the value of the skin of the kid, as forming a soft, pliant, and durable leather for gloves, is universally acknowledged. The goat is more productive than the sheep, the female usually producing two or even three kids at a birth: the period of gestation is five months. With the domestic races of England, we are all familiar; the varieties it exhibits in stature, colour, the length of its hair, and the size and figure of the horns, need not be detailed. In one breed we notice a pendulous fleshy excrescence on each side of the throat; and we have remarked that, in this race, the hair is short, and the beard scarcely to be discerned.

Of the foreign varieties, we may particularise the following:—The *Syrian goat*, a variety common in several parts of the East, and remarkable for the length of the ears, which are pendulous, and drag on the ground while the animal is feeding. This race appears to be one of considerable antiquity, from an expression in Amos (iii. 12), “As the shepherd taketh out of the mouth of the lion two legs, or a piece of an ear, so shall the children of Israel be taken out that dwell in Samaria,” &c.

Dr. Russell observed two sorts of goats about Aleppo—one that differed little from the common sort in Britain—the other remarkable for the length of its ears. The size of the animal, he informs us, is somewhat larger than ours, but their ears are often a foot long, and broad in proportion. They were chiefly kept for their milk, of which they yielded no inconsiderable quantity. This breed is common in the vicinity of Jerusalem, and is the ordinary kind of Cairo, where, as at Aleppo, it is kept for the sake of its milk. “Small flocks are driven every morning through various quarters of the city, and every one sees taken from them the quantity of milk that he wants.”

The *Whidaw goat*; a dwarf variety, common in Guinea, and a silky-haired race, of small stature, also occurring in Africa.

The *Angora goat*. It is remarkable that not only the goat, but the cat, and the rabbit, in the district of Angora, in Asia Minor, are covered with long fur of great delicacy and fineness. The Angora goat, in this respect, has been long celebrated. It is covered with fine hair, disposed in long spiral ringlets, or tufts, and generally of a pure white. It is from this hair that the finest camlets are prepared; hence, in the rocky mountains of Cappadocia, flocks of these animals are reared and tended with great care. The males of this race are furnished with long, spirally-twisted horns, diverging laterally—while, in the female, the horns are much smaller, and turned back. In both sexes the ears are pendulous, the limbs short, and the general form robust. Examples of this variety are sometimes imported to our island; but hitherto no serious attempts have been made to naturalise it with a view to the employment of its fleece in manufactures.

The *Cashmir, or Thibet goat*.—In Cashmir, and along the river Ural, is a breed of goats, which produces a wool of exquisite delicacy, from which are manufactured the Cashmir shawls, to be purchased in Europe only at a great price, and costly even in the country where they are wrought. The Cashmir goat is covered with silky hair, long, fine, flat, and falling—and with an under-vest of delicate greyish wool. It is this wool which constitutes the fabric of the shawls. In stature the Cashmir goat equals the moderately-sized race of England, and is robust and active; the horns are nearly erect, spiral, and diverging at the points; the ears are erect, and, like the rest of the body, covered with long silky hairs. The

*Cashmir Goat.*

peculiar odour, so strong in our European goats, is not to be perceived in this race, which may be regarded as of all others the most valuable. On all goats, and particularly on the long-haired breeds of Europe, will be found beneath the hair, and close to the skin, a wool, finer than that produced by the finest Merino sheep, and of which, as F. Cuvier remarks, it is singular that no European has availed himself in the production of a web, which, if not equal to that of a Cashmir shawl, would be very beautiful.

We cannot do better than conclude with an account of the attempts made to introduce this breed of animals into Europe, taken from the Penny Magazine:—

“The great price paid for a Cashmir shawl has led some enterprising individuals to attempt naturalising

in Europe the animal which produces the wool from which those shawls are made. It was very properly observed that much of the cost to the European purchaser was attributable to the great distance the article had to be brought, and to the high and arbitrary duties paid upon it, both for manufacturing and transporting. An extract from the journal of a French traveller will show how the matter stands between the producer and the buyer. The wool is first combed from the animal in the mountains of Thibet, where it is sold for nearly five shillings a pound: it is packed in baskets and sent to Cashmir, where it pays a duty on entry. It is there bleached with rice-flour, spun into threads, and taken to the bazaar, where another tax is paid upon it: the thread is then dyed, the shawl is woven, and the border sewed on; but the weaver must not sell his work, he must carry it to the custom-house, where a collector puts on any tax he pleases, and in this he is limited only by the fear of ruining the weaver altogether, and consequently losing any future profit. All the shawls intended for Europe are, now packed up and sent to Peshawer across the Indus; this part of the journey is generally performed upon men's backs, for the road is in many parts impassable even for mules, being across deep precipices which must be traversed by swinging bridges of ropes, and perpendicular rocks which are climbed by wooden ladders; at each station of this long traverse, which lasts twenty days, a tax is paid, generally arbitrary, but seldom much exceeding 2*l.* sterling on the whole journey. From this point until they come near the confines of Europe, in addition to the many custom-houses at which they must pay tribute, these unlucky shawls have to encounter the dangers of almost continual anarchy in Afghanistan, and the risk of

pillage in Persia by the Turkomans and Kirghiz, whose forbearance must be purchased at a high price. After leaving Persia many shawls get to Europe over the Caucasus and through Russia; but the largest number reach Constantinople through the Turkish provinces, and even then they have a tedious journey to perform before they reach the wearer. Although this statement may not be perfectly accurate, the great increase to the original price caused by the route taken is undoubted, and a knowledge of this fact stimulated the exertions of those persons who proposed to breed the shawl-goat in Europe. The animal was not quite unknown. In the 'Penny Magazine' for 1833 an account of one was given from a specimen in the Jardin des Plantes at Paris, which was received from Calcutta, where it had been bred from a couple brought directly from Cashmir. But a whole flock was wanted, not a single individual; and, as the attempt to bring any number of these animals by land from such an enormous distance as Thibet was deemed impossible, every inquiry was made as to the probability of getting a supply from some of the wandering pastoral tribes who in their migrations might occasionally touch on the confines of Thibet, and sometimes reach the steppes of Asiatic Russia. Under the French empire, persons were sent to the fair of Macarief (since removed to Nijnei Novgorod) to make inquiries of the Asiatic merchants who annually assembled at that great mart, and they learned there that flocks of Thibet goats were numerous in the steppes of Russia. Although circumstances prevented any steps being taken to procure flocks at the time, the information thus obtained proved very serviceable in directing an expedition which was fitted out several years afterwards for the purpose of purchasing some.

“The gentleman selected to take charge of the expedition was Monsieur Jaubert, whose knowledge of the Turkish language and character peculiarly fitted him for travelling through countries peopled by Turkish tribes. Monsieur Jaubert left Paris in April, 1818, and proceeded towards Asia, through Southern Russia, by Odessa, Taganrog, and Astrakhan. On his way he received much information from merchants of Bukharia and Armenia, and ascertained that a handsome race of goats with brilliant white fleeces was to be found among the Kirghiz tribes, who wander in the plains partly surrounded by the great bend of the river Ural or Yaik, which divides Europe from Asia. Samples of the down from these animals were shown him, and he found locks of it scattered here and there in parts of the steppes between Astrakhan and Orenburg, which convinced him that he was in the track of the genuine shawl-goat; this was further corroborated by the designation of *Tibet*, by which name the animal was known to the native tribes. He soon found large flocks of the goats in possession of the Kirghiz, and of them he purchased nearly thirteen hundred, with which he prepared to retrace his steps. The home journey across the plains of Russia appears to have been injudiciously timed; it was begun at the setting-in of winter; the goats crossed the Volga at Tsaritsin, nearly 300 miles above Astrakhan, and proceeded to Taganrog, where it was intended to embark them; but, as might have been expected, the sea was frozen, and it was found necessary to drive them on to Caffa, which they reached on the 24th of December, nearly 300 of their number having died by the way of cold and fatigue.

At Caffa the flock was divided into two portions; one of these, consisting of 566 goats, was put on

board a Russian vessel, which arrived at Marseilles about the middle of April, 1819; the remainder embarked on board another vessel with Monsieur Jaubert himself, and reached Toulon towards the end of April. No further account has reached us of this latter portion of the flock, but ample details concerning the division which landed at Marseilles have been given by Monsieur Tessier, who was commissioned to receive the animals as soon as they should leave the lazaretto, where they were shut up on landing, according to the quarantine regulations. M. Tessier found the poor creatures in a wretched state; they had been packed together in the hold of the vessel, where no fresh air ever reached them; and the space they had to move in was less than the length of their bodies. This treatment had produced disease in almost all the flock; the hair was dropping from them, and it was found necessary to shear off what remained. They also suffered from convulsions; but the most fatal malady with which they were attacked was a tubercular consumption, from which great numbers perished. A close lazaretto was not calculated to remove the complaint, and many deaths took place daily during the thirty days they were confined. 'We have saved but very few,' says M. Tessier, 'and only such as had slight attacks; the remedy employed was flour of brimstone mixed with their food.'

The animals that escaped these multiplied ills were soon removed to more congenial situations; some were placed in the royal bergerie near Perpignan, at the foot of the Pyrenees, some in the hilly country about Toulon, and others farther to the west in the departments near the Rhoné. The whole number surviving of both flocks when Monsieur Tessier wrote his account (August) was about 400; they were then

generally in good health, their hair had grown to a considerable length, and the valuable down had begun to show itself.

“The shawl-goat was thus naturalized; and subsequent experience has shown that the down produced in Europe is not inferior to that of the original Thibet stock. Fears were at first entertained that this could not be the case; it was said that the breed obtained was not pure, that it had degenerated; and a letter from Moorcroft, written in the beginning of 1822, at Ladakh in Thibet, seemed to confirm the suspicion. He says, ‘France has, I learn, procured a flock from some of the steppes near the Caspian, which must be inferior to those of Thibet, as lately Aga Aabdi was employed by Russia itself to procure the breed from the borders of Chinese Turkestan.’ But these fears were unfounded. A more serious evil was the small quantity of wool produced by each goat, which on an average amounted to less than three ounces; and the high price paid in Thibet for the raw material proves that the defect is in the original species. Such a small produce precluded all hope of making a profit by rearing the animal, and the scheme would have failed had not the intelligence of an enlightened Frenchman overcome the difficulty. Shortly after the arrival of the Thibet goats in France several specimens of the Angora goat were brought into that country from Persia: one of these animals, belonging to the Duchess of Berri, was seen in 1822 by Monsieur Polonceau, proprietor of several of the Thibet goats. The length and silkiness of the hair of this goat were extraordinary, and Monsieur Polonceau judged that a cross between the two races would be an improvement to both; the experiment was tried, and it succeeded beyond his most sanguine expectations. Instead of the minute quantity of three

ounces, or even less, several of the mixed race furnished thirty ounces of down in one season, and their average produce of his flock was above sixteen ounces: this was not at the expense of quality; its silkiness was greatly increased, it was finer and longer in the staple, and it had all the peculiar softness of the original stock. It was also found that the mixed race was more robust, more easily fed, and, what was of equal importance, it was less headstrong than the common goat of Europe, and could be managed as easily as a sheep; while at the same time it was active enough to seek food in such steep places as would be inaccessible to sheep.

“The great step was now made, and there would be little difficulty in diffusing the improved stock. The unmixed race had already been brought from France into England by Mr. Tower, and located, in 1824, at Weald Hall, in Essex, where it rapidly increased, and was in every respect like the French parents. In the year 1828 three shawls were made at Paisley of the wool of Mr. Tower’s flock; and they were judged by a committee of manufacturers to be superior to any brought from France. But the produce did not increase; it was still barely three ounces, and ten goats were required to furnish wool enough for a shawl of a yard and a half square. Englishmen therefore began to turn their attention to the mixed race; but the importance of wool to our Australian colonies, and the very great improvement which has been invariably produced in the fleeces of sheep exported thither, naturally induced speculation in that quarter. Mr. Riley, an enterprising proprietor of New South Wales, saw Mr. Ternaux’s flock of pure Thibet goats at St. Ouen in 1828, but the small quantity of their produce deterred him from attempting so long a voyage with so little prospect of advan-

tage. He was then recommended to visit the crossed race of Monsieur Polonceau at Versailles, which he did, and was at once convinced of its superiority: he was very anxious to purchase some of them, but the desire of Monsieur Polonceau to increase his stock, and to continue his experiments on a large scale, made that gentleman unwilling to part with any. Mr. Riley was consequently compelled to defer the execution of his object until his next voyage to Europe, which was at the close of 1831. He then visited Monsieur Polonceau again, found his stock greatly increased, and his expectations fully answered. He prevailed on that gentleman to sell him ten females and three males, all of which he conveyed safely to London. We regret we are unable to furnish the result of Mr. Riley's endeavours. The last account we have seen is a letter dated London, March, 1832, written to the Society of Arts by Mr. Riley, who had returned from France with his little flock, and was then carefully preparing them for their voyage. At that time some of the females had produced young, which was the seventh generation from the original cross. The Society presented Mr. Riley with their gold medal for his valuable endeavours.

"The crossed race, like the pure stock, begins to show a little down early in September, and sheds it spontaneously in March; it is therefore evidently a provision against the cold of winter, which in Thibet, as in Europe, extends from September to March. In New South Wales these are the summer months, and it would be interesting to ascertain whether the goats will continue to produce their warm covering at the accustomed time, or if they will change their habits with the climate. Possibly, like some flowers brought from the northern to the southern hemisphere, or *vice versa*, they may for a few years continue

their primitive habit, and then suddenly change it; or the old ones may continue the original habit, and those born in the southern hemisphere adopt the one congenial to their new abode. In any case there is little doubt that the Shawl-Goat will be a valuable addition to the stock of the colony."

