A treatise on cattle : showing the most approved methods of breeding, rearing, and fitting for use, asses, mules, horned cattle, sheep, goats, and swine ; with directions for the proper treatment of them in their several disorders : to which is added, a dissertation on their contagious diseases ; carefully collected from the best authorities, and interspersed with remarks / by John Mills, Esq.

Contributors

Mills, John, -1784?
Spotswood, William, 1753?-1805
Foote, A. E. 1846-1895
National Library of Medicine (U.S.)

Publication/Creation

Boston : Printed and sold by William Spotswood, no. 55, Marlborough-Street, 1795.

Persistent URL

https://wellcomecollection.org/works/pd9mj3x4

License and attribution

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

A

TREATISE

ON

CATTLE:

SHOWING THE

MOST APPROVED METHODS OF

Breeding, Rearing, *and* Fitting *for* Uſe,

ASSES,		*SHEEP,*
MULES,		*GOATS,* and
HORNED CATTLE,		*SWINE.*

WITH DIRECTIONS FOR

THE PROPER TREATMENT OF THEM IN THEIR SEVERAL DISORDERS:

To which is added,

A Diſſertation on their Contagious Diſeaſes.

Carefully collected from the beſt AUTHORITIES, and interſperſed with REMARKS.

By JOHN MILLS, Eſq.

Fellow of the Royal Society of London, Honorary Member of the Dublin Society, of the Royal Societies of Agriculture at Paris and Rouen, of the Oeconomical Society of Berne, and of the Palatine Academy of Sciences and Belles-Lettres.

BOSTON:

PRINTED AND SOLD BY WILLIAM SPOTSWOOD,
NO. 55, MARLBOROUGH-STREET.

1795.

IN THE PRESS,

And ſpeedily will be publiſhed, by

WILLIAM SPOTSWOOD, BOSTON,

MILLS's

MODERN SYSTEM OF FARRIERY;

Comprehending all the moſt valuable PRESCRIPTIONS and approved REMEDIES, accurately proportioned and properly adapted to every known diſeaſe to which the Horſe is incident; together with the moſt approved methods of breeding, rearing, and fitting them for uſe; alſo directions how to judge of Horſes.

To which is added,

A ſucceſsful Method of treating the CANINE SPECIES in that deſtructive Diſeaſe called the Diſtemper.

By JOHN MILLS, Eſq.

Author of the TREATISE ON CATTLE, &c.

CONTENTS.

BOOK I.

Of ASSES. Page 1

BOOK II.

Of MULES. 10

BOOK III.

Of HORNED CATTLE. 15

CHAP. I. *Of the general Properties and Uſes of Horned Cattle* ibid.

CHAP. II. *Of the Choice of Cattle, and of fitting them for Tillage* 23

CHAP. III. *Of Feeding, Fattening, and Tending of Cattle* 28

CHAP. IV. *Of the Propagation of Cattle, Care of the Cow whilſt pregnant, and Management of the Calf, till fit for Slaughter, or for Work* 39

CHAP. V. *Of the Diſeaſes of Horned Cattle* 46

BOOK IV.

Of SHEEP.

CHAP. I. *Of the Qualities and different Kinds of Sheep* 53

CHAP. II. *Of the Management of Sheep* 65

CHAP. III. *Of the Propagation of Sheep* 91

CHAP. IV. *Of the Diſeaſes of Sheep* Page 95
SECT. I. *Of cutaneous Diſeaſes in Sheep* 100
SECT. II. *Of Diſeaſes of the Head and Throat* 103
SECT. III. *Of Coughs and Shortneſs of Breath* 104
SECT. IV. *Of Diſeaſes of the Belly* 105
SECT. V. *Of Diſeaſes of the Liver* ibid.
SECT. VI. *Of the Dropſy* 107

BOOK V.

Of GOATS. 111

BOOK VI.

Of SWINE. 118

CHAP. I. *Of the Character, Properties, and Uſes of Swine* ibid.
CHAP. II. *Of Feeding and Fattening of Hogs* 121
CHAP. III. *Of the Propagation of Swine* 124
CHAP. IV. *Of the Diſeaſes of Swine* 128

BOOK VII.

Of the CONTAGIOUS DISEASES of CATTLE 129

Of the Cauſes of the contagious Diſeaſes of Cattle 151
Of the Cure of the contagious Diſeaſes of Cattle 159
Additional Obſervations on the Diſeaſes of Cattle, and on their Cures; by the Royal Society of Agriculture at Paris 182
On the Symptoms and Cure of the late contagious Diſtemper among the Horned-Cattle in England; by Peter Layard, of Huntington, M. D. and F. R. S. 211

A TREATISE ON *CATTLE.*

BOOK I.

Of ASSES.

FAR from deſerving the contempt in which he is generally held, the *aſs* is, in fact, one of the moſt neceſſary animals about a farm-houſe. He coſts hardly any thing to keep, and does a great deal of work, ſuch as carrying corn to the mill, proviſions to the market, or to labourers in the field, with numberleſs other uſeful offices; for, in proportion to his ſize, he will carry a heavier load than perhaps any other animal. In ſome countries too, he is made to till the ground where the ſoil is light, to draw a cart, and even to ſerve inſtead of a horſe for riding poſt: nor is there any more eaſy going, or ſurer footed creature. The milk of the female is an excellent medicine to man, particularly in conſumptive and gouty caſes; and the ſkin

of theſe animals is rendered ſerviceable and profitable after they are dead; for of it, being very hard and very elaſtic, are made drums, ſieves, &c. The merit of the aſs's ſkin pocket-books is well known; and in many parts the peaſants make good ſtrong ſhoes of the tanned ſkin of the aſs's back. It is alſo with the hinder part of the aſs's ſkin that the Orientals make the *ſagri (a)*, which we call ſhagreen†. The dung of aſſes is an excellent manure for ſtrong or moiſt lands.

Is it then, as M. de Buffon compaſſionately aſks on this occaſion (*c*), that men extend their contempt of thoſe who ſerve them too well and too cheaply, even to animals? The horſe, continues he, is trained up; great care is taken of him, he is inſtructed and exerciſed; whilſt the poor aſs, left to the brutality of the meaneſt ſervant, and the wantonneſs of children, inſtead of improving, cannot but be a loſer by his education. Moſt certainly, if he had not a large fund of good qualities, the manner in which he is treated, would be ſufficient to exhauſt them all. He is the ſport, the butt, the drudge of clowns, who, without the leaſt thought or concern, drive him along with a cudgel; beating, over-loading, and tiring him. It is not remembered, that the aſs would be, both in himſelf and for us, the moſt uſeful, the moſt beautiful, and moſt diſtinguiſhed of animals, if there were no horſe in the world. He is the ſecond, inſtead of being the firſt; and for that alone he is looked upon as nothing. It is the compariſon that degrades him. He is conſidered, he is judged of, not in himſelf, but relatively to the horſe. We forget

(*a*) See *Thevenot's Travels, tom II p.* 64.

† The beſt is made with the ſkin that covers the rump and buttocks of the wild aſs. It is prepared in Syria, and comes from Conſtantinople.

(*c*) *Hiſtoire Naturelle de l'Aſne.*

that he is an aſs; that he has all the qualities of his nature, all the gifts annexed to his ſpecies; and think only on the figure and qualities of the horſe, which are wanting in him, and which he could not have without ceaſing to be an aſs.

By his natural temper, he is as humble, as patient, and as quiet, as the horſe is proud, fiery, and impetuous. He bears with firmneſs, and perhaps with courage, blows and chaſtiſements. He is ſober, both with regard to the quantity and quality of his food; contenting himſelf with the harſheſt and moſt diſagreeable herbs, which the horſe and other animals diſdain to touch. In water, indeed, he is very nice, drinking only of that which is perfectly clear, and at brooks he is acquainted with. He is as temperate in his drinking as in his eating, and does not plunge his noſe into the water, from a fear, as is ſaid (*d*), of ſeeing the ſhadow of his ears; and to this alſo, ſome, with great ſeeming reaſon, impute his being leſs ſubject to the glanders than the horſe*. As no one beſtows upon him the pains of currying, he often rolls himſelf on the graſs, on thiſtles, or on fern; and, without

(*d*) *Cardanus, de Subtilitate, l. x.*

* Quadrupeds do not all drink in the ſame manner, though all are under the like neceſſity of ſtooping their heads to the water, becauſe they cannot otherwiſe reach it; the monkey and ſome few others excepted, which, having hands, can drink like a man out of a veſſel given them; for they put it to their mouth, and inclining the veſſel, pour out the liquor, which they ſwallow merely by the motion of deglutition. The dog, the aperture of whoſe mouth is very large, and furniſhed with a long and ſlender tongue, drinks by lapping; that is, licking up the water, and forming with his tongue a cup, which being filled every time, brings up a pretty large quantity of liquor. This method he prefers to that of wetting his noſe. Whereas the horſe, having a leſs mouth, and his tongue too thick and ſhort to form a large cup, and which, beſides, drinks eagerly, thruſts his noſe to ſome depth into the water, which he thus ſwallows plentifully by the ſimple motion of deglutition. But this very circumſtance obliges him to drink all at a breath; whereas the dog breathes freely all the time he drinks; and ſo does likewiſe the aſs, who only juſt touches the water with his lips.

minding his load, he lies down to roll as often as he has an opportunity, as if to reproach his maſter with the little care taken of him; for he does not welter like the horſe in mud and water, but is cautious even of wetting his feet, and turns aſide to avoid any dirt: accordingly, his legs are drier and more cleanly than thoſe of the horſe. He is ſuſceptible of education†, and ſome have been trained in ſuch a manner as to be ſhown for a curioſity (*g*). Regular currying and rubbing down would undoubtedly much improve the look of the aſs, and be of ſervice to its health.

In his early youth he is ſprightly, and not void of prettineſs, agility, and good humour; but he ſoon loſes theſe good qualities, either through age or ill treatment, and becomes ſluggiſh, untractable, and obſtinate; eager only for pleaſure, or rather ſo mad after it, that nothing can reſtrain him; nay, ſome have been known to be ſo violent, as to die within a few minutes after copulation; and as his love is a kind of frenzy, ſo he has alſo the ſtrongeſt affection for his iſſue. Pliny aſſures us, that if the dam be ſeparated from her foal, ſhe will ruſh through flames of fire to rejoin it. The aſs is alſo fond of his maſter, though generally ill treated by him. He ſmells him at a great diſtance, and diſtinguiſhes him from every other man. He likewiſe knows again the places where he has been uſed to live, and the roads which he has travelled. His ſight is ſtrong, and his ſmell is ſurpriſingly quick,

† In Perſia they are taught to amble; to which purpoſe the fore and hind legs of the ſame ſide are tied together with cotton lines, at a greater or leſs diſtance aſunder, according to the ſtep the creature is to make in ambling. Theſe lines are faſtened to the girth at the place of the ſtirrup: a ſort of grooms ride them morning and evening, and habituate them to this pace. Their noſtrils are ſlit to give them the more wind, and they go at ſuch a rate that there is no keeping up with them but on a gallop. *Voyages des Chev. Chardin, tom. II. p.* 26, 27.

(*g*) *Aldrovand, de Quadruped. ſoliped. lib. I. p.* 308.

eſpecially with regard to the effluvia of the ſhe-aſs. He is very quick of hearing, which has contributed to his having been ranked among the timid animals, who are all ſaid to be very quick of hearing, and to have long ears. When over loaded he hangs down his head and drops his ears; when too much vexed, he opens his mouth and draws back his lips in a very diſagreeable manner, which gives him a ſneering and deriſory aſpect. If his eyes are covered, he ſtands motionleſs; and when lying on his ſide, if his head is placed in ſuch a manner that one eye reſts on the ground, and the other eye be covered with a ſtone, or piece of wood, he will continue in that poſture, without ſhaking himſelf, or attempting to riſe. Like the horſe, he walks, trots, and gallops; but all his motions are ſhort and much ſlower. Though he may run at firſt with ſome ſwiftneſs, he can do ſo but for a little way and a ſhort time; and whatever pace he takes, he ſoon gives over if hurried.

The horſe neighs, and the aſs brays, which laſt is done by a very long and highly diſagreeable and diſcordant cry through alternate diſſonances, from the grave to the acute, and from the acute to the grave. He hardly ever makes this noiſe but when ſtimulated by luſt or by hunger. The voice of the ſhe-aſs is clearer and ſhriller than that of the male. A caſtrated aſs brays but weakly; and though he ſeems to make the ſame efforts, and has the ſame motions with the throat, his cry does not reach to any great diſtance*. Of all hairy animals, the aſs

* That judicious inveſtigator of the works of nature, M. de Buffon, thinks it a rule without exception, that in all quadruped animals, the voice of the male is ſtronger and deeper than that of the female; though ſome of the ancients tell us, that the cow, the ox, and even the calf, have a deeper voice than the bull Certain it is, that the bull has a far ſtronger voice, as being heard to a much greater diſtance than either of them; and what gave riſe to a belief of his voice being leſs deep, probably was his manner of lowing, which is not a ſimple ſound,

is the leaſt ſubject to vermin. He is never troubled with lice, probably owing to the hardneſs and dryneſs of his ſkin, which is indeed harder than that of moſt other quadrupeds; and this alſo renders him leſs ſenſible than the horſe, to the whip, and the ſtinging of flies.

At the end of two years and a half, the aſs ſheds his foal-teeth, and next the other inciſories, which dropt out, and are renewed in the ſame order as thoſe of the horſe. The age of an aſs is alſo known by the teeth; and the third of the inciſories, on each ſide, is denoted as in the horſe.

The aſs is capable of generating ſo early as at the age of two years. The female is even ſooner ripe than the male, and full as laſcivious; for which reaſon ſhe is a bad breeder, ejecting again the ſeminal fluid ſhe had juſt received in coition, unleſs the ſenſation of pleaſure be immediately removed by loading her with blows; the only method of preventing the conſequences of her amorous convulſions. This is a precaution without which they would very ſeldom retain. The moſt uſual times of her heat are in the months of May and June. After pregnancy, her heat is ſoon over, and in the tenth month the milk appears in her teats. In the twelfth month ſhe foals; and ſeven days after parturition, the heat returns, and ſhe is again fit to receive the male; ſo that ſhe may, as it were, be kept continually engendering and nouriſhing her young. There is hardly an inſtance of her having two foals at a time. At the end of five or ſix months the foal may be wained; and 'tis even ne-

but compoſed of two or three octaves, the laſt of which moſt affects the ear; and if we liſten to it, we ſhall perceive a ſound more hollow than that of the ox, the cow, or the calf, whoſe lowings are alſo much ſhorter. It is love only that cauſes the bull to low; the cow oftener lows from fear than love; and when the calf lows, it is from grief, hunger, or a deſire to be with its mother.

ceſſary that it ſhould, if the dam be pregnant, in order that the fœtus may have proper nouriſhment. At the age of three years he ſhould be accuſtomed to work, and it will be right then to ſhoe him with a light ſhoe, particularly to guard the fore part of his hoof.

To have good aſs's milk for medicinal uſes, the ſhe-aſs muſt be ſound, in good caſe, and one that has foaled lately, and not been covered ſince. The foal that ſhe then ſuckles muſt be taken from her; ſhe muſt be kept clean, and fed with hay, oats, barley, and herbs whoſe ſalubrious qualities are adapted to the diſeaſe. This milk muſt not be ſuffered to grow cold, nor ſhould it even be expoſed to the open air, becauſe in either of theſe caſes it ſoon ſpoils.

A ſtallion-aſs ſhould be choſen from among the largeſt and ſtrongeſt of his ſpecies. He ſhould be at leaſt three years old, and not exceed ten. His legs ſhould be long, his body full, his head erect and airy, his eyes lively, his noſtrils large, his neck longiſh, his breaſt broad, his back fleſhy, his ribs broad, his rump flat, his tail ſhort, and his pile gloſſy, ſoft, and of a dark grey. The moſt common colour in aſſes is the mouſe grey; but there are alſo gloſſy greys, and grey mixed with dark ſpots, as well as ſome of a dun colour, ſome brown, and others black.

There are different breeds amongſt aſſes, as well as amongſt horſes; but the former are leſs known, becauſe they have been leaſt attended to. That they all came originally from hot climates, is a fact ſcarcely to be doubted. Ariſtotle (*i*) aſſures us, that in his time there were no aſſes in Scythia, nor even in Gaul, where, he ſays, the climate is ſomewhat cold; to which he adds, that a cold climate

(*i*) *De Generat. Animal. lib. II.*

diſables them from propagating their ſpecies, or cauſes them to degenerate: and we have Linnæus's teſtimony (*k*) that they have not been long known in Sweden*. In fact, they ſeem originally to have come from Arabia, and thence to have paſſed into Egypt, from Egypt into Greece, from Greece into Italy, from Italy into Spain and France, and afterwards into Germany, England, and laſtly into Sweden, &c. in all which countries it is to be obſerved, that the colder the climate is, the weaker and ſmaller the aſſes are.

The Spaniſh aſſes are by far the fineſt of any now in Europe. The climate, and the care that is taken of them, render them ſuch; for, undoubtedly, on account of the badneſs of their roads and the ſure-footedneſs of theſe creatures, the Spaniards, who make great uſe of them and of mules for travelling, feed and treat them well, and thereby render them beyond compare more gentle, active, and docile than they are with us. So great is the eſtimation in which they hold theſe animals, that a large, ſtout he-aſs frequently ſells for ſixty guineas on the ſpot; and if it be ſuſpected that he is to be carried out of the country, he will not be parted with for leſs than a hundred. In Auvergne too, where indeed the cold is felt as much as in any province of France, they have large and high-priced aſſes; and as they thrive as well, work as hard, and live as long in all parts of this iſland as they do in any other country whatever, it cannot be doubted that they would likewiſe do as well here in all reſpects, with

(*k*) *Fauna Suecica.*

* Neither aſſes nor horſes were found in America when the Spaniards firſt diſcovered that country, though the climate, eſpecially that of the ſouthern parts, agrees with them as well as any other. Thoſe carried over thither by the Spaniards, and turned looſe in the large iſlands, and on the continent, have increaſed ſo conſiderably, that in ſeveral places wild aſſes are ſeen in troops, and they are taken in toils, like wild horſes.

proper management. The preſent goodneſs of our roads in general, and the great plenty we have of all ſorts of horſes, may indeed, in ſome meaſure, account for our neglect of aſſes; but do we not carry that neglect too far? A little attention might perhaps diſcover purpoſes for which theſe animals are peculiarly proper; ſuch as their travelling ſafely over high and ſtony mountains, paſſing ſecurely through narrow winding paths in mines, and in the working of machines, for which they ſeem perfectly qualified by their natural ſteadineſs.

The aſs, which, like the horſe, requires three or four years to attain its full growth, lives alſo, like that animal, twenty-five or thirty years: but the females are generally ſaid to be longer lived than the males; a conſequence, perhaps, of their being a little more tenderly uſed, on account of their being often pregnant; whereas the males are worked and beaten without intermiſſion.

Aſſes ſleep leſs than horſes; and if ever they lie down to ſleep, it is only when they are quite ſpent with labour. The ſtallion-aſs alſo laſts longer than the ſtallion-horſe. His eagerneſs ſeems to increaſe with his age; and in general the health of this animal is much more ſteady and confirmed than that of the horſe. He is far more hardy, and ſubject to a much leſs number of diſeaſes. Even the ancients mention few, except the glanders, and this is very rare. As to the reſt, the diſeaſes of theſe animals are to be treated in the ſame manner as thoſe of horſes.

BOOK II.

Of MULES.

THE mule is a beaſt of burden, begot by a male aſs and a mare, or by a ſtallion horſe and a female aſs. There are both male and female mules, and both of them are very eager for copulation; but they do not breed, at leaſt in climates like this. Some think it is becauſe they proceed from two different ſpecies of animals: but others ſay poſitively that they do breed in hot countries.* In France, where many mules are bred, they are not ſuffered to couple, becauſe that renders them vicious and ſpiteful.

* All animals which owe their origin to creatures of different ſpecies are generally termed *mules*, and accounted barren: but, though it does not appear that mules, proceeding from the aſs and mare, or from a ſtallion-horſe with a ſhe-aſs, produce any thing either among themſelves, or with thoſe from whom they are derived; yet, as M. de Buffon obſerves in his Natural Hiſtory of the Goat, this opinion is perhaps ill founded: for the ancients poſitively aſſert that the mule is able to procreate at ſeven years, and that he does actually procreate with the mare (*a*). They alſo tell us, that a mule is capable of conception, though it never brings its fruit to maturity (*b*). Theſe things, which throw a veil of darkneſs over the real diſtinction between animals and the theory of generation, ſhould therefore either be confuted or confirmed. Beſides, had we ever ſo clear a knowledge of all the ſpecies of animals around us, yet we know not what a mixture between themſelves, or with foreign animals would produce. We are, continues this judicious writer, but little acquainted with the *jumar*, that is, the produce of the cow and the aſs, or the mare and the bull. We know not whether the zebra would not copulate with the horſe or the aſs: whether the thick-tailed creature known by the name of the Barbary ram, would not produce with our ewe: whether the chamois be

(*a*) *Mulus ſeptennis implere poteſt, et jam cum equa conjunctus hinnum procreavit.* Ariſt. Hiſt. Animal. lib. VI. cap. xxiv.

(*b*) *Eaque concipere quidem aliquando mula poteſt quod jam factum eſt; ſed enutrire atque infantem perducere non poteſt. Mas generare interdum poteſt.* Ariſt. de Generat. Animal. lib. II. cap. vi.

Mules live a long while, often above thirty years. They are very healthy, and partake of the qualities of the animals from which they proceed; that is to ſay, they have the ſtrength of the horſe, and the hardineſs of the aſs. They ſeem born for carrying heavy burthens, for carrying them gently, and for laſting a long time. They hardly ever ſtumble. Their ſenſe of ſmelling is uncommonly quick. They are very fantaſtical, and apt to kick, and their obſtinacy is become proverbial. We know not of any wild ones.

In Spain, almoſt all the carriages are drawn by mules: they carry the baggage and equipages of princes and officers, and are of excellent ſervice, particularly in mountainous places. Traders and millers uſe them there to carry their merchandize and their corn: they are even made to plow the ground, and to thraſh the corn by treading it out.

They are alſo much uſed in Italy; and in Auvergne they are employed for every thing that is uſually done elſewhere by horſes and oxen, of which there are but few in that province of France. They form a part of the parade of great perſonages abroad when they make their public entries: and it is not long ſince the magiſtrates in France rode upon mules to their courts of juſtice, and phyſicians to viſit their patients. The Flemings uſed formerly to breed from their large ſized mares conſiderable numbers of very ſtately mules, ſome of them ſixteen and ſome ſeventeen hands high, and

not a ſpecies of wild goat; whether it would not with our goat form ſome intermediate breed: whether monkies differ in real ſpecies, or whether like dogs, they are all of one and the ſame ſpecies, but varied by a number of different breeds: whether the dog can produce with the fox and the wolf: whether the ſtag produces with the cow, the hind with the buck, &c. Our ignorance with regard to all theſe facts, is almoſt invincible; the experiments by which alone they can be decided, requiring more time, and more attention and expence, than the life and fortune of a common perſon will admit of.

they were very ſerviceable as ſumpter-mules in the army: but ſince the Low Countries have ceaſed to bear the Spaniſh yoke, they breed fewer mules. They were alſo much more common in this country in former times than they are at preſent, being often brought over hither in the days of popery by the Italian prelates. They continued longeſt here in the ſervice of millers, and are yet in uſe among them in ſome places, on account of the great loads they are able to carry. We alſo ſend ſome to the Weſt-Indies, where they are much uſed and eſteemed. Poitou, and the Mirebalais, in France, ſtill continue to breed great numbers of mules, but Auvergne yet more, and theſe laſt are moſt eſteemed*.

To have handſome and good mules, the ſtallion-aſs ſhould be in his full vigour, and therefore above three years old, and not more than ten: he ſhould be of a good breed; for in the ſtuds of mules, which are not uncommon in foreign countries, a ſtallion-aſs of a good breed is worth ſixty or ſeventy pounds, whereas a middling one will not fetch above eleven or twelve: he ſhould be well made, that is to ſay, large ſized, with a ſtout, thick neck; ſtrong and broad ribs, an open and muſcular cheſt, fleſhy thighs, tight-made legs, and above all well provided in his genitals, as thoſe of the Mirebalais are remarkably. As to the colour, the plain black, or black ſpeckled with a rather lively red, or the ſilver grey, or grey intermixed

* The Spaniards have long had ſuch a predilection for mules, that it raiſed the price of ſhe-aſſes to the high degree before mentioned, and produced an abſolute prohibition of exportation. It has alſo leſſened their regard and attention to horſes; inſomuch that the ſtuds of Andaluſia formerly eſteemed the fineſt in Europe, have loſt their credit, and future ages will hardly believe what has been truly ſaid of the Spaniſh horſes. To remedy this, the government have more than once thought of reſtricting the uſe of mules to eccleſiaſtics and women.

with dark ſpots, are the moſt eſteemed: the mouſe-grey, which is the moſt common colour of aſſes, ſhould be rejected.

The mares ſhould be under ten years of age, and as near as can be of the ſame colour as the ſtallion, eſpecially when one deſires to have black mules, which are the moſt eſteemed. In the year 1689, it was enacted in France, that no ſtallion-aſs ſhould be given to a mare under fourteen hands high, which is tall enough to produce the fineſt mules; and the large, full-bodied mares in that country, are reſerved for the multiplication of this breed.

The ſtallion-aſs becomes ſo furious at the ſight of the mare intended for him, that he muſt always be kept muzzled at that time, leſt he ſhould maim the grooms who lead her to him.

It generally is from the middle of March to the middle of June that the aſs is given to the mares, in order that, as they go eleven or twelve months, the mules may be born at a time when there is plenty of good ſucculent graſs, fit for the dam and her young one. The aſs ſhould be reſted for a week before he covers the mare, and during that time he ſhould have oats once a day, and be fed with good hay. Mares which have been covered by a ſtallion-aſs go a whole year, and they cannot ſuckle their young ones above ſix months, on account of a pain they have in their teats after that time: theſe mule-colts muſt therefore be weaned at that time, or made to ſuck another mare.

The mules begot by an aſs and a mare, are better and handſomer than thoſe which come from a ſhe-aſs covered by a ſtone-horſe: they are even two different kinds. Alſo the male-mules are ſtronger than the female, and therefore preferred for labour and long journeys.

A good male mule ſhould have round and thickiſh legs, little belly, the body firm, and the rump

hanging down towards the tail. The female ſhould alſo be full bodied, but with ſmall feet and dry legs, well ſpread buttocks, a wide cheſt, a long and arched neck, and a ſmall lean head.

The age of mules, both male and female, is known by their teeth, in the ſame manner as that of horſes. Many judge of the height they will be of by the length of their legs. At three months the legs have attained their full growth, and they are then half the height of the mule.

When three years old, they are broken and trained like colts; but much greater patience is required here, becauſe they are much more headſtrong and fantaſtical. Wine is ſaid to familiarize them; and one of their feet is tied up to the thigh to prevent kicking, and at the ſame time render them docile. They kick only with their hind legs. Many do not uſe them for work till they are five years old.

They are fed and managed in the ſame manner as horſes, and are ſubject to the ſame diſeaſes; conſequently the methods of cure as generally practiſed for the latter, are likewiſe to be recurred to for theſe animals. The *Maiſon Ruſtique*, from whence I have borrowed the greateſt part of this article, M. de Buffon not having any where profeſſedly ſpoken of the mule, ſays, (*c*) in addition to the treatment of their diſeaſes, that a pint of red wine, in which half an ounce of flour of brimſtone, a raw egg, and a dram of myrrh have been mixed, will, if given repeatedly for ſome time, in caſe of their growing lean, reſtore them to their fleſh and good appearance; and alſo, that the ſame remedy will cure them of gripes and coughs.

(*c*) *Tom. 1. part I. liv. III. chap. iii.*

BOOK III.

Of HORNED CATTLE.

CHAP. I.

Of the general Properties and Uſes of Horned Cattle.

THE Ox is the moſt valuable of horned cattle. He coſts but little to keep, and yields a conſiderable profit: is very good for draught, and for the plough; ſubject to few diſeaſes, and thoſe eaſily cured. He lives to a good age, and requires but a trifle to harneſs him, though no creature turns up the earth ſo well; and when he is worn out with ſervice, he is fattened, and becomes excellent food; or, if he breaks a limb he is killed, and his fleſh is eaten. His ſkin and his ſuet ſell for a good price. Even his horns and his gall fetch ſomewhat, and his dung is a good manure. In ſhort, he may juſtly be ſtyled, by way of excellence, *the animal*; for, beſides the great ſervices which he renders to man, he returns to the earth full as much as he takes from it; even meliorates the ſoil on which he lives, and fattens his paſtures; whereas the horſe, and moſt other animals, exhauſt the richeſt meadows in a few years. Without the ox, both rich and poor would find it difficult to ſubſiſt: the earth would lie uncultivated; our fields, and even our gardens would be dry and barren. He is a principal inſtrument in all works of huſbandry, the moſt uſeful ſervant in a farm, and the ſupport of rural œconomics; for on him depends the moſt laborious part of agriculture.

Formerly the wealth of man conſiſted chiefly in his herds of black cattle, and they ſtill continue to be the baſis of national opulence; for it is only by the cultivation of lands, and the abundance of cattle, that a ſtate can be maintained in a flouriſhing condition. Theſe are, alone, real goods: all others, gold and ſilver not excepted, are only arbitrary; money and credit having no other value than what they derive from the products of the earth.

That the ox is not ſo proper for carrying burdens as the horſe, the aſs, the mule, the camel, and ſome other beaſts, is evident, from the form of his back and reins: but his thick neck and broad ſhoulders declare him to be perfectly fit for draught; and accordingly it is with them that he draws to the greateſt advantage, though ſuch is the abſurdity of ſome men, and ſuch their blind attachment even to the moſt ridiculous cuſtoms, that he ſtill is, in many parts, and particularly in ſeveral of the provinces of France, made to draw by his horns, on the ſhallow pretence of his being then moſt eaſily guided: a cuſtom almoſt as prepoſterous as was that of the Iriſh, who, till lately, uſed to make their horſes draw the plough by their tails. It may indeed be true, that the ſtrength of the ox's head is ſufficient to enable him to bear tolerably well this method of labouring: but certainly he performs his work much leſs eaſily, and leſs well, than when he draws by the ſhoulders, which nature ſeems to have formed purpoſely for the plough. The unwieldy magnitude of his body, the ſlowneſs of his paces, the ſhortneſs of his legs, every thing, even his quietneſs and patience in toil, evidently concur to fit him for tillage, and enable him, beyond any other animal, to ſurmount the conſtant reſiſtance of the earth againſt his efforts. The horſe, though perhaps equally ſtrong, is leſs proper for this uſe;

his legs are too long, his paces too quick and impetuous, and he ſoon frets and tires. Beſides, by putting him to the plough, we deprive him of all the agility and ſuppleneſs of his motions; of all the beauty of his attitude and carriage: for this heavy work requires rather perſeverance than hard labour; rather ſtrength than ſwiftneſs, and weight rather than elaſticity: and accordingly, wherever the compariſon had been made with any degree of accuracy between horſes and oxen for the labours of the field, and eſpecially for ploughing, the difference has been found to be conſiderably in favour of the latter, in every reſpect but that of ſpeed; and even in this article their inferiority amounts to nothing more than being two hours in a day longer at work than horſes: for they perform the ſame quantity of work every day, and that too in a better manner. It is univerſally allowed that they are cheaper in every ſenſe; for they coſt leſs when bought, are leſs expenſive in their food, their harneſs, and their ſhoeing; are ſubject to much fewer diſorders, require far leſs attendance, and at laſt remain fit for fatting when their labours are over, as was before obſerved. Yet, ſtrange fatuity! notwithſtanding all theſe advantages, they are ſo little uſed at preſent for the works of huſbandry in this kingdom, that, if we may truſt to the report of the author of the *Six Months Tour through the North of England* (*a*), and ſurely we may confide in what that gentleman ſays from his own perſonal inquiries and obſervations on the ſpot, whole counties in England, which, not many years ago, ſcarcely poſſeſſed a plough-horſe, now have not a ſingle ploughing ox.

To account for this very extraordinary and every way highly detrimental change, and at the ſame

(*a*) *Vol. IV. letter xxxii.*

time to refute the groundleſs opinion of thoſe who look upon it as a kind of proof that horſes are really preferable, the author here referred to, Arth. Young, Eſq. F. R. S. very judiciouſly attributes it to the great price which live cattle have yielded of late years. "It is well known," ſays he, "that the regular courſe of buſineſs in the "ox-counties, uſed to be, to keep three ſets of "beaſts; one of young cattle that were coming into "work; the teams; and fattening cattle, that had "been worked three years. But when cattle "came to be ſo very dear, as to coſt when lean "near as much as they ſold for when fat, the ox-"farmers were tempted to ſell their young ſtock "before they ploughed them; or at leaſt to throw "them directly to fattening, that their high value "might come in the ſooner. And as horſes, once "bought, required no annual addition, they by "degrees increaſed with all poor farmers, to enable "them to ſell their oxen at high prices. The "great decreaſe of the uſe of oxen during the pe-"riod of live cattle ſelling ſo very high, gives ſome "reaſon to ſuppoſe this the cauſe of it. I need "not, ſurely, add, that this, or any other reaſon "that can be offered, is, and muſt be, falſe and "incomplete; and that the uſe of them in tillage "is much ſuperior to that of horſes. The avarice "of the farmers has alone driven them out of uſe, "not for the ſake of profit, but for raiſing money "at a future expence. The great farmers in Nor-"thumberland, who, we are certain, are not "*poor*, ſtill continue to make much uſe of oxen, "*viz.* half and half."

If the above arguments are not ſufficient, the following indiſputable fact, atteſted by the ſame obſervant writer, who relates what he himſelf ſaw, muſt ſurely ſilence for ever the

moſt prejudiced advocates for ploughing with horſes. (*b*)

Wenman Cooke, Eſq. of Longford, in Derbyſhire, executes all his ploughing and home-carting, which are very conſiderable, with oxen harneſſed nearly in the ſame manner as is practiſed for horſes, excepting that the collars open to be buckled on, and are worn with the narrow end, which is the part that opens, downward. The chains are faſtened to them in the ſame direction as in a horſe harneſs, but much above the cheſt, and in a line almoſt even with their backs. The beaſts of courſe draw thus much higher than horſes. He likewiſe finds that they draw with much greater power in this manner than in yokes, that they move much faſter, are more handy and convenient, and that they perform their work at much leſs expence than could be done by horſes, as well as even more expeditiouſly, as appears from Mr. Cooke's ploughing as much land in a day with three oxen, as the farmers do with four or five horſes. A diſproportion ſo amazingly great, that, as Mr. Young very properly remarks, it decides at once, and in the cleareſt manner, the long conteſted point, whether horſes or oxen are the fitteſt for the plough. Mr. Cooke feeds them in the ſummer on graſs alone, and in the winter on ſtraw; on which laſt indeed, he works them only moderately; but if hard, they then have hay, or ſome turneps. Mr. Young declares that he ſaw a team of oxen, thus harneſſed, drawing a heavy load of bricks, and obſerved that not one horſe-team in ten could have out walked them. The drivers aſſured him, that they worked much better thus than when yoked, that they were able to draw a greater weight, and were far more eaſily managed. When oxen are yoaked, they

(*b*) In *the Farmer's Tour through the Eaſt of England, vol. I. letter iv.*

move awkwardly, and often with ſuch inequality between the couples, that, as is well known to all ox-drivers, it is common for one beaſt to make its companion bear the whole ſtreſs of the draught. This inconvenience, as well as the objection that oxen trample the land too much when they are yoaked together in ploughing, is totally removed in Mr. Cooke's method, which ſeems in fact to be an improvement of M. de Chateauvieux's, mentioned in the ſecond volume of my ſyſtem of huſbandry (*c*). The making of the oxen go in a ſingle line inſtead of a double one, is alſo extremely uſeful in ſome ſorts of ploughing; and it has been proved by repeated experience, that they may eaſily be rendered ſo tractable as to be guided by a line like horſes.

The cow may alſo be rendered fit for the labours of the field, and, though not ſo ſtrong as the ox, be made to ſupply his place: but when ſhe is employed in this ſervice, care ſhould be taken to match her as nearly as poſſible with an ox of equal ſtrength and ſize, in order to preſerve an equality of draught between them; for the leſs unequal they are, the more eaſily and readily the tillage is performed. Stiff lands, eſpecially ſuch as turn up in large long clods, often require ſix or eight oxen to plough them; whereas a ſandy and looſe ſoil may be tilled with only two cows: and beſides, in this laſt, the furrows may be continued to a greater length than in the former. Among the antients, an hundred and twenty paces was the greateſt length of a furrow which the ox was to make by one continued effort, after which, ſay they, he is not to be goaded farther, but allowed to breathe a while, before the ſame furrow is continued, or another begun. But, among the antients, agriculture was a favourite ſtudy: they did not diſ-

(*c*) *Page* 92—94: where is alſo a drawing of the ox-harneſs invented by that illuſtrious cultivator.

dain to put their own hands to the plough; at leaſt, they countenanced the huſbandman, and conſulted both his eaſe and that of the ox: whereas amongſt us, they who enjoy the moſt of the products of the earth are, in general, the laſt to eſteem, encourage and ſupport the art of cultivation. There are few STUART MACKENZIES, ſenſible, like the immortal SULLY, that tillage and paſtures are the only real foundation of the laſting proſperity of ſtates.

The barren cow, which the country people call a *free martin*, has almoſt as much ſtrength, and is nearly as fit for the works of huſbandry as the ox. Its fleſh too is ſaid to be very nearly as good to eat *.

The principal uſe of the bull is to propagate the ſpecies; and though he alſo may be ſubjected to the yoke, yet one cannot be ſure that he will work quietly, and the uſe which he may make of his prodigious ſtrength is conſtantly to be guarded againſt. He is naturally untractable, ſtubborn and fierce, and, in the bulling ſeaſon, abſolutely uncontroulable, and often furious: but caſtration deſtroys the ſource of theſe violent impulſes, without diminiſhing his ſtrength. He alſo grows larger, heavier, and more unwieldy when caſtrated, and thereby becomes the better adapted to the labour for which he is intended. This operation likewiſe renders him more tractable, patient, docile, and leſs troubleſome to others. A herd of bulls could not be either teamed or managed by all the ſkill and power of man.

* We are told, but may perhaps deſire leave to doubt it, that when a cow brings a bull and a cow calf together, the latter is always a *free martin*, and never bears. The Romans were not unacquainted with the ſterile cow, and call her *taura*. According to Mr. Liſle's information, the head of the free martin is coarſer made than that of a heifer, her horns are wider ſpread, and her udder is ſmaller. He adds, that the fleſh of a fatted free martin will fetch a half-penny a pound more than any cow beef.

Moſt country people know how to perform this operation: but the different effects which will reſult from the various times of performing it have not perhaps yet been ſufficiently attended to. In general, the moſt proper age for caſtration is that immediately preceding puberty, which, in horned cattle, is eighteen months or two years; few of thoſe that undergo the operation ſooner, long ſurviving it. It is true, indeed, that calves, whoſe teſticles have been taken out ſoon after their birth, become, if they ſurvive the operation, which is very dangerous at that early age, larger, fleſhier, and fatter, than thoſe which are not caſtrated till their ſecond, third, or fourth year: but in return, theſe laſt ſeem to retain more ſpirit and activity; and thoſe which are not caſtrated till their ſixth, ſeventh, or eighth year, loſe little or nothing of their other maſculine qualities, being more impetuous and difficult to manage than other oxen; nay, in their bulling ſeaſon, they endeavour to get at the cows, which muſt be carefully guarded againſt, becauſe the copulation, or even the bare touch of ſuch an ox, produces in the vulva of the cow a kind of carnoſities or warts, which nothing but the actual cautery can deſtroy.

The horned cattle, of which we now ſpeak, afford a proof that the heavieſt and moſt ſluggiſh animals are not always thoſe which ſleep the longeſt, nor the moſt ſoundly; for the ſleep of theſe is ſhort, and ſo unſound, that the leaſt noiſe awakes them. They uſually lie on the left ſide, and the kidney on that ſide is always larger, and has more fat about it than that on the right ſide.

CHAP. II.

Of the Choice of Cattle, and of fitting them for Tillage.

OXEN, like other domeſtic animals, are of various colours. The dun is the moſt common, and the redder it is, the more the creature is eſteemed: the black are alſo valued; and bay oxen are ſaid to be vigorous and long-lived; whereas the brown ſoon decay. The grey, the pied, and the white, are commonly deemed fit only for ſlaughter; it being the general opinion, which by the bye I doubt, that no pains can render them fit for labour. However, be that as it may, whatever is the colour of an ox's coat, it ſhould be gloſſy, thick, and ſmooth to the touch; for if it be harſh, rough, or thin, there is room to ſuſpect that the animal is out of order, or at leaſt not of a ſtrong conſtitution.

The age of the ox is known by his teeth and horns. The firſt fore-teeth, which he ſheds at the end of ten months, are replaced by others, larger, but not ſo white: at ſix months after this, the teeth next to thoſe in the middle, fall out, and are alſo replaced by others: and in three years all the inciſory teeth are renewed. They are then even, long, and pretty white; but as the creature advances in years they wear, and become unequal and black. It is the ſame with the bull and the cow; ſo that, conſequently, the growth and ſhedding of teeth are not affected by caſtration, nor by the difference of ſexes. Neither is the ſhedding of their horns affected by either; for the ox, the bull, and the cow, loſe them alike at the end of three years, and they are alike replaced by other horns, which, like the ſecond teeth, remain; only

the horns of the ox and cow are thicker and longer than thoſe of the bull. The manner in which theſe ſecond horns grow is not uniform, nor is their ſhooting equal. In the firſt year of their appearance, which is the fourth of the ox's age, two ſmall pointed horns bud forth, neatly formed, ſmooth, and terminated by a kind of button towards the head of the animal. The next year this button moves from the head, being impelled by a corneus cylinder, which, alſo lengthening, is terminated by another button, and ſo on; for the horns continue to grow as long as the creature lives. Theſe buttons become rings, or annular joints, which are eaſily diſtinguiſhed in the horn, and by which the age of the animal may at once be known; reckoning three years for the point of the horn down to the firſt joint, and one year for each of the other intervals.

A good ox for the plough muſt be neither too fat nor too lean; his head ſhould be ſhort and thick; his ears large and ſhaggy; his horns ſtrong, gloſſy, and of a middling ſize; his forehead broad; his eyes full and black; his muzzle thick, ſhort and flat; his noſtrils wide and open; his teeth white and even; his lips black; his neck fleſhy; his ſhoulders large and heavy; his breaſt broad; his dew-lap hanging down to his knees; his reins very broad; his ribs broad, and not cloſe; his belly ſpacious and ſloping downwards; his flanks firm; his haunches large; his rump thick and very round; his thighs and legs large, fleſhy and nervous; his back ſtrait and full; his tail reaching to the ground, and well covered with thick and fine hair; his feet firm; his hide thick and pliable; his muſcles raiſed; and his hoof ſhort and broad. He muſt alſo anſwer to the goad; be obedient to the voice of his driver, and eaſy to govern: but it is only gradually, and

by beginning early, that he is brought willing to bear the yoke, and be eaſily managed.

At the age of two years and a half, or at fartheſt three, it is time to begin to tame him, and bring him under ſubjection; for if this is delayed longer, he becomes headſtrong, and often ungovernable. The only method of ſucceeding herein is, by patience, mildneſs, and even careſſes; for violence and rough uſage will only diſguſt him beyond the power of recovery. Stroaking him gently along the back, clapping him with the hand, giving him occaſionally boiled barley, ground beans, and ſuch other aliments as pleaſe him moſt, all of them mixed with ſalt, of which he is very fond, will prove of the greateſt uſe. At the ſame time a rope ſhould be frequently tied about his horns, and ſome time after the yoke ſhould be put about his neck, and faſtened, firſt to a pair of wheels only, and then to a plough, with another ox of the ſame ſize ready trained: after this they ſhould be tied together at the ſame manger, and be led together to paſture, that they may become acquainted, and accuſtomed to ſtep alike. The goad ſhould never be made uſe of at firſt, becauſe it then would only render him more untractable. He muſt alſo be indulged, and labour only at ſhort intervals; for till he has been thoroughly trained, he tires himſelf very much; for which reaſon alſo he ſhould then be fed more plentifully than at other times. Alſo, when he is to work, eſpecially if it be in ſtiff or ſtony ground, and likewiſe when he is to go upon the road, he ſhould be ſhod, or, as the country people and farriers term it, cued. He ſhould draw the plough only from his third to his tenth year; for after this it will be adviſable to fatten and ſell him, his fleſh being then better than if he was kept longer.

It is ſaid that oxen which feed ſlowly bear labour better than thoſe which eat faſter; that ſuch as

have been bred in dry and high countries, are handſomer, more vigorous, and more ſprightly, than thoſe of low and moiſt countries; that dry hay ſtrengthens them more than ſoft graſs; that they cannot bear a change of climate ſo well as horſes; and that, for this reaſon, oxen for labour ſhould always be purchaſed in the neighbourhood of the place where they are to work.

In general, countries ſomewhat colder than our own ſeem to agree better with black cattle than thoſe which are hotter; and they are larger and more fleſhy, in proportion as the climate is moiſter, and abounds in paſture.

The largeſt black cattle that we know of are thoſe of Denmark, Podolia, the Ukraine, and Calmuck Tartary. The Engliſh, Iriſh, Dutch, and Hungarian cattle are alſo larger than thoſe of Perſia, Turkey, Greece, Italy, France, and Spain; and the ſmalleſt we know of are thoſe of Barbary, and our own iſlands of Alderney and Man. The Dutch import yearly from Denmark numbers of large lean cows, which, when improved by living in the rich paſtures of Holland, yield a great deal more milk and butter than our common breed of cows. Their calves are alſo much larger and ſtronger; and, except four or five days before their calving, they may be milked during the whole year. Theſe cows, commonly called Flanders cows, require excellent paſtures, though they eat little more than the common ſort; but as they are always lean, the ſuperabundance of their food turns wholly to milk; whereas our common cows, after living ſome time in luxuriant paſtures, become fat, and yield little or no milk. From a bull of this kind and a common cow, is produced another breed, called *baſtard*, which is both more prolific, and abounds more in milk than the common breed. Theſe baſtard cows often bring two calves at once, and alſo yield milk all the year round. They con-

ſtitute a large part of the wealth of Holland, which exports every year butter and cheeſe to a very conſiderable amount. Theſe cows give much more milk than our common ones, as was before ſaid, twice as much as thoſe of France, and ſix times as much as thoſe of Barbary.

The beſt Engliſh oxen and cows, for largeneſs and neatneſs of ſhape, are bred in the counties of York, Derby, Lancaſter, Stafford, Lincoln, Glouceſter, and Somerſet. Thoſe bred in Yorkſhire, Derbyſhire, Lancaſhire, and Staffordſhire, are generally black, with large well-ſpread horns. Thoſe of Lincolnſhire are, for the moſt part, pied, very tall and large, and fitteſt for labour. Thoſe bred in Somerſetſhire and Glouceſterſhire are generally red, and for ſhape much like thoſe of Lincolnſhire. Wiltſhire breeds large cattle, but with ill-ſhaped heads and horns. Surry is famed for a breed of white cows, which are ſaid to yield an uncommonly rich milk; and it is added, that their fleſh takes ſalt more readily than that of any other breed. The black ſort is commonly the ſmalleſt, but at the ſame time very ſtrong, and conſequently fit for labour. The cows of this colour ſeldom yield more than a gallon of milk at a meal, as it is called; but continue to bear being milked till within a very few days of calving. The white and red ſorts give, in general, near three times as much milk as the black, but grow dry much ſooner; eſpecially the white. The red kind is generally the largeſt of any ſort we have in England, and is commonly thought to give more and richer milk than thoſe of other colours. Some likewiſe ſay that they bring better calves, and therefore adviſe keeping this breed free from mixture with any other. It may certainly be looked upon as a general rule, that the cow which gives milk longeſt is beſt both for the dairy and for breeding; and that the younger the cow is, the

better will be the breed, provided ſhe be paſt her ſecond year.

A gentleman will chooſe the cow that gives the beſt milk, in preference to one which yields a larger quantity of leſs good; whereas the latter will anſwer beſt to the farmer, for fattening calves, lambs, and his whole breed of ſwine. The bullock of a moderate ſize will alſo be preferred by the gentleman, for beef for his table, becauſe its fleſh is better reliſhed, and finer grained; and the larger ſize may be more prized by the farmer, becauſe they fetch more money at market, their fleſh being moſt eſteemed for ſalting, eſpecially for naval uſe; for it is found to ſhrink leſs, and to be leſs preyed on by the ſalt, than the beef of ſmaller cattle.

CHAP. III.

Of Feeding, Fattening, and Tending of Cattle.

THE ox eats faſt, and takes in a ſhort time all the nouriſhment he wants, after which he ceaſes to eat, and lies down to chew the cud; whereas the horſe feeds both day and night, ſlowly, but almoſt inceſſantly. This difference in their manner of feeding proceeds from the different make of their ſtomachs: for the ox, whoſe two firſt ſtomachs form but one very capacious bag, can eaſily ſwallow ſo large a quantity of herbage as ſoon to fill his maw, and that done, he chews the cud afterwards, and digeſts it at leiſure; whilſt the horſe, having but a ſmall ſtomach, can put into it only a ſmall quantity of graſs, and continue to replenifh it as the food ſinks and paſſes into the

inteſtines, where the decompoſition of the aliments is chiefly performed: and accordingly, upon inſpection of theſe parts both in the ox and the horſe, and the ſucceſſive effect of digeſtion, particularly the decompoſition of hay, M. de Buffon ſaw (*a*), that, in the ox, on its leaving that part of the maw which forms the ſecond ſtomach, it is reduced to a kind of green paſte, like ſpinage minced and boiled; that it retains this appearance in the folds of the third ſtomach; that the decompoſition is completed in the fourth ſtomach; and that what paſſes into the inteſtines is only the huſks and recrements: whereas in the horſe, he obſerved, that this decompoſition is hardly viſible, either in the ſtomach or firſt inteſtines, where it becomes only more ſupple and flexible, having been macerated and penetrated by the active liquor with which it is ſurrounded; and that it reaches the cœcum and colon without any great alteration; that it is in theſe two inteſtines, whoſe enormous capacity anſwers to the maw in ruminating animals, that the decompoſition of a horſe's aliment is chiefly performed; and that this decompoſition is never ſo perfect as that in the fourth ſtomach of the ox.

From theſe obſervations, and the bare inſpection of the parts, it is eaſy to conceive how rumination is performed, and why the horſe neither ruminates nor vomits; whereas the ox, and all the horned cattle, with other animals which have ſeveral ſtomachs, ſeem to digeſt the graſs only by rumination, which is nothing more than vomitting without effort, occaſioned by the re-action of the firſt ſtomach on the aliments it contains. The ox fills his two firſt ſtomachs (the ſecond being only a part of the firſt), and the membrane thus extended re-acts on the graſs within it, which has been but very

(*a*) *Hiſtoire Naturelle de Boeuf.*

little chewed, and its bulk increaſed by fermentation. Were the aliment liquid, this contracted force would make it paſs into the third ſtomach, which communicates with the other only by a narrow duct, the orifice of which is ſituated at the upper part of the firſt, and but little below the æſophagus; ſo that no dry aliment can paſs through this duct, or at leaſt none but the more fluid part of it. Thus the drier parts neceſſarily aſcend through the æſophagus, whoſe oriſice is larger than that of the duct into the mouth. Here the animal chews them again, macerates, and once more impregnates them with its ſaliva; and thus by degrees renders the aliment more fluid, till it is reduced to a paſte of a proper liquidity to paſs through the duct which communicates with the third ſtomach: and here again it undergoes another maceration, before it paſſes into the fourth ſtomach, where the decompoſition of the food is compleated, by being reduced to a perfect mucilage.

What confirms the truth of this explanation is, that while theſe animals ſuck, or are fed with milk and other fluid aliments, they do not chew the cud: and that they chew the cud much more in winter, and when fed with dry food, than in ſummer, when the graſs is ſucculent and tender. In the horſe, on the contrary, the ſtomach is very ſmall, the orifice of the æſophagus very narrow, and the paſſage from the ſtomach to the inteſtines, or pylorus, very wide, which alone would render rumination impracticable; for the food contained in this ſmall ſtomach, though perhaps more ſtrongly compreſſed than in the large ſtomach of the ox, cannot re-aſcend, becauſe it may ſo eaſily deſcend through the capacious orifice of the pylorus. It is therefore owing to this general difference in the conformation of the parts, that the ox ruminates, and the horſe cannot: but there is another particular

formation in the horſe, which renders him not only unable to ruminate, that is, to vomit without effort, but even hinders him from vomiting at all, though he ſhould make the ſtrongeſt efforts ſo to do; and this is, that the duct of the æſophagus enters ſo obliquely into the horſe's ſtomach, that inſtead of opening by the convulſive motions of the ſtomach, it becomes contracted. Though this difference, like all the other differences of conformation obſervable in the bodies of animals, depends on nature when conſtant and unvaried; yet, in the growth, and eſpecially in the ſoft parts, there are differences apparently conſtant, which however may, and actually do, vary by circumſtances: for inſtance, the capacity of the ox's maw is not wholly derived from nature: it is not ſuch by its primitive conformation, but is gradually rendered ſo by the large bulk of the aliments put into it; for in a young calf, or even in one that is older, if the animal is fed only on milk, and never on herbage, the maw is much ſmaller in proportion than in the ox. The very great capacity of the maw therefore proceeds from the extenſion occaſioned by the large bulk of aliments put into it at one time; as M. de Buffon has clearly proved by the following experiment (*b*). He cauſed two calves of the ſame age, and weaned at the ſame time, to be fed, one with bread, and the other with graſs; and at the expiration of a year, on opening them, the maw of the calf which had lived on graſs and herbage, was become much larger than the maw of that which had been fed with bread. I have been the more particular in the above account of the manner in which ruminating animals are nouriſhed, and of the cauſes why the horſe can neither ruminate nor vomit, becauſe it may afford ſome ſatisfaction

(*b*) See ibid.

to thoſe who might not, perhaps, otherwiſe be able readily to aſſign a reaſon for their different ways of feeding.

A general caution proper to be attended to on this occaſion, is, that great care ſhould be taken not to over-ſtock a paſture with cattle; becauſe the greateſt profit really ariſes from their being conſtantly kept in good condition; eſpecially thoſe that give milk, and thoſe that are big with young. The ſtinted breed of cattle which we often meet with, and uſually impute to the poorneſs of the paſture, badneſs of the climate, &c. is in fact generally owing to the miſmanagement of their owners, who, through a very ill-judged greedineſs, over-ſtock their paſtures, and thereby diſable the mothers from giving ſufficient nouriſhment to their young, either before or after they are born: and this original ſtinting ſticks by them through life, unleſs they chance to get very early into a rich paſture; for then, indeed, they ſometimes ſoon outſtrip their original breed; a circumſtance which proves, that if they were at all times equally well kept, the breed would be much mended.

As oxen are not worked much in the winter, good ſtraw, and a little hay will then nouriſh them ſufficiently: but during the time that they do labour, they ſhould have a great deal more hay than ſtraw, and even a little bran or oats before they go to work. In ſummer, if hay be ſcarce, they may have graſs freſh cut from the field, or the young ſucculent boughs and ſhoots of aſh, elm, oak, and other trees; but theſe laſt ſhould be given ſparingly, becauſe an exceſs of this aliment, of which they are very fond, ſometimes cauſes them to make bloody urine. Clover, lucerne, ſainfoin, burnet, when theſe can be had; vetches, boiled barley, turnips, carrots, parſnips, cabbages, &c. are alſo excellent food for theſe animals. There is no need to mea-

ſure out the quantity of their food, becauſe they never eat more than they want; and it is therefore proper always to give them more than they will eat*. They ſhould never be turned into the paſtures till about the middle of May; becauſe the firſt growth of the graſs and other herbs is too crude, and though they eat them greedily, they diſagree with them. After they have ſpent the ſummer in the paſtures, they ſhould be houſed about the middle of October; taking care that theſe tranſitions from green food to dry, and from dry to green, be not done at once, but by degrees.

The cuſtom of giving ſalt among the fodder is of an old date, for Columella mentions it (*c*) as the practice of his time, and very properly recommends it much, as well calculated to promote their appetite, and conſequently to aſſiſt their fattening. I have heard it obſerved by a gentleman from America, that the deſire for ſalt is much greater in cattle and horſes at a diſtance from the ſea, than in the countries near it; owing perhaps to a greater freſhneſs of the water. Even in Switzerland, the native horſes of that country are very fond of ſalt, and it is a conſtant cuſtom to give it them. There are in ſeveral parts of America, diſtant from the ſea, ſpots diſcovered by the wild beaſts, ſuch as deer and buffaloes, where the earth is of a ſaline nature, to which theſe creatures reſort regularly, and lick the earth with their tongues. They are called *ſalt-licks*, and are ſometimes an hundred or an hundred and fifty feet wide.

Salt mixed with hay, which has not been well

* Cattle, and all other animals which chew the cud, have the ſingular advantage that they never eat more at once than is ſufficient for them; for they then lie down and chew the cud: whereas horſes, and many other animals, continue to eat as long as they are able to ſwallow.

(*c*) *Lib. VI. c. iv.*

got in, ſeems to act as an enemy to that fermentation in the juices which raiſes the heat in the hay: for where it is mixed with paſte or other ſoft ſubſtances, it prevents putrefaction; probably by hindering the neceſſary preceding ferment. Thus it becomes uſeful in hay on a double account.

Though violent cold is very hurtful to theſe creatures, great heat is perhaps ſtill more ſo. For this reaſon, in the ſummer-time they ſhould be led to their work by break of day, and when it grows very hot, be either ſent home, or left to feed under the ſhade of trees, and not returned to work again till three or four o'clock in the afternoon. In autumn, winter, and ſpring, they may be at plough from eight or nine in the morning, till five or ſix in the evening without intermiſſion. But I cannot, by any means, approve of keeping them continually out of doors; eſpecially for cows that give milk, or are with calf. It is ſurely inhuman to expoſe a creature to a degree of cold which it is not naturally fenced againſt.

Though oxen do not require ſo much attendance as horſes, yet to keep them briſk and healthy, it will be proper, eſpecially when they work, to curry them every day, to rub them down, waſh them, clear their feet of gravel and dirt, greaſe their hoofs, &c. They muſt alſo have drink twice a day, morning and evening. The horſe likes a thick and warmiſh water; but for the ox it muſt be clear and cool. The pavement of their ſtables ſhould be a little inclined, that wet may not reſt on it, and they ſhould alſo have dry litter laid under them.

The age at which oxen are generally fattened is their tenth year, becauſe there is no certainty of ſucceeding therein afterwards, nor is their fleſh ſo good when they are older. They may be fattened in any ſeaſon of the year; but ſummer is commonly choſen, becauſe it is done then at leaſt expence. If

it is begun in May or June, they are generally completely fattened before the end of October. From the very beginning to fatten them, they muſt be taken from all work, drink often, and have plenty of ſucculent food, ſometimes mingled with a little ſalt as before ſaid; or, when a beaſt falls off his ſtomach, graſs dipped in vinegar will alſo reſtore his appetite, and conſequently help to make him fatten the ſooner. They muſt not be diſturbed while they are chewing the cud; and during the great heats, they ſhould ſleep in the cow-houſe, or ſome other ſhady place. By this means they will become ſo fat in four or five months, as to be ſcarce able to walk; ſo that if they are to be ſent to any diſtant place, it muſt be by very ſlow journies that they are removed. Cows, and even bulls whoſe teſticles have been knit, may alſo be fattened: but the fleſh of cows is drier, and that of the knit-bull redder and tougher, than the fleſh of oxen; and that of the bull has always a ſtrong, diſagreeable taſte.

Turnips are made to yield a great profit in feeding and fattening of cattle, particularly in Norfolk, and, of late years, in ſeveral other counties in England. When large, they ſhould be ſliced, as well to enable the beaſts to eat the quicker, as to prevent their choaking themſelves, which they would otherwiſe be apt to do. Carrots are yet wholeſomer, much more ſubſtantial, and conſequently more profitable food: beſides which, they render the fleſh of the cattle that are fed with them firmer and better taſted, as the Flemings have long experienced: but a yet more nouriſhing food is parſnips, eſpecially for milch-cows, which, when fed with them, give more milk than with any other winter fodder, and that milk yields better butter than the milk of cows nouriſhed with any other ſubſtance. Cattle eat theſe roots raw at firſt, ſliced

lengthwiſe; and when they begin not to reliſh them, they are cut in pieces, put into a large copper, preſſed down there, and boiled with only ſo much water as fills up the chaſms between them. Our neighbours in Brittany reckon one crop of parſnips, uſed for feeding cattle, equal in value to more than three crops of wheat (*b*). Potatoes are another good and very heartening food, and may, as has been before ſaid of parſnips, be parboiled when cattle like them beſt that way. Buck-wheat makes very good fodder for cattle; and ſo does, in particular, the yellow-flowered vetch. In Germany and Flanders, ſpurrey is preferred before any other fodder, not excepting even corn, and is found to produce the richeſt milk and beſt butter. Cabbages, eſpecially the Scotch kale and the great American cabbage, are reckoned preferable to turnips, in point of health as well ſpeed in fattening, and it is ſaid, that one acre of them will go as far as three of turnips: but it is to be obſerved, that in uſing them, eſpecially for milch-cows, the withered or decayed leaves ſhould be thrown away, becauſe they are thought to give a bad taſte to the milk.

Clover is undoubtedly an excellent food for cattle, and we are told that one acre of it will feed as many of them as four or five acres of common graſs: but they ſhould never be turned into it in wet weather, nor whilſt the dew is yet upon the plant, leſt it ſhould burſt them. It ſhould be given them ſparingly at firſt, till it purges them: for when it has produced this effect, the danger is generally over. But of all the plants that are given to cattle for their food, none is equal to lucerne, either for early, ſpeedy, or good fatting; for with this

(*b*) *Obſervations de la Societé d' Agriculture, de Commerce, et des Arts, établie par les Etats de Bretagne. Années* 1757 *et* 1758. *p.* 82.

the grazier may begin fattening towards the end of April, and finiſh about the middle of harveſt, when meat generally bears an high price. A large fatting ox may be allowed forty pounds, or perhaps more, of green lucerne each day*. All cattle are remarkably fond of lucerne, and always prefer that which has been cut a day or two, and ſtood twenty-four or forty-eight hours in a dry, ſhady place. By this precaution too all danger of its ſwelling them, which it might otherwiſe be apt to do, like clover and trefoil, is removed: only it is to be obſerved, that more caution ſhould be uſed in giving it to cows, than to bullocks. When oxen or heifers are fed for the butcher with lucerne, the fat will ſpread itſelf through the lean, like veins in marble; and the fleſh will be remarkably well flavoured.

Oil-cakes, meaning the reſidue of the ſeeds of lin, rape, or cole-ſeed, after their oil has been expreſſed from them, are well known to be great fatteners of cattle, eſpecially if theſe drink plentifully with them: but they are apt to render the fat yellow and rank. To remedy this, the cattle ſhould be fed with dry fodder, for a fortnight or three weeks before they are killed.

A beaſt is well-fed outwardly, that is to ſay, well covered with fleſh, when his huckle-bones appear round and plump, his ribs ſmooth, his flanks full, his neck thick, his cod round, and, on feeling him upon the nethermoſt ribs, the ſkin feels ſoft and looſe; and if, beſides the above marks, the ſetting on of the tail feels thick, full and ſoft, and the navel round, ſoft, large and plump, it is a ſure ſign that he is alſo well tallowed, that is, well fatted inwardly.

* The antient Romans allowed twenty pounds of lucerne-hay at night to a large labouring ox, that was not fatting.

All theſe creatures are very apt to lick themſelves, when at reſt, and this is thought to be an impediment to their fattening. To prevent it, all the parts of their bodies within their reach are rubbed over with their dung; without this precaution, their tongues, which are very rough, abrade, or take off their hair, which they ſwallow; and as this cannot be digeſted, it remains in the ſtomach, gathers together there, and forms by degrees round balls, called *ægagropiles*, which always hinder digeſtion, and ſometimes grow ſo large as to be very troubleſome, and even to endanger the life of the animal. They are, in time, covered with a brown cruſt proceeding from an inſpiſſated mucilage, which, by continual friction and coction in the ſtomach, becomes hard and gloſſy. Theſe balls are found only in the maw: for if any hair gets into the other ſtomachs, it does not remain either there or in the inteſtines, but probably gets off with the excrements. However, this ſubject, and the diſorders occaſioned by theſe balls, will be treated of more fully in the fifth chapter of this book, where I ſhall ſpeak of the diſtempers to which theſe animals are ſubject.

I cannot conclude this ſubject of the feeding of oxen, without adding M. de Buffon's juſt remark, that animals which have inciſory teeth in both jaws, ſuch as the horſe and the aſs, nip ſhort herbage more eaſily than thoſe whoſe upper jaw is without inciſories: and if ſheep and goats cut the graſs very cloſe, it is owing to the ſmallneſs and thinneſs of their lips; but the thick-lipped ox can only crop the long herbage: and this is the true reaſon why he never injures the paſtures in which he lives. As he crops only the extremity of the long herbage, he does not affect the root, and retards its growth but very little; whereas the ſheep and the goat, by biting the herbage very cloſe, both

deſtroy the ſtem, and injure the crown of the root. The horſe chooſes the moſt ſlender herbage, and leaves the larger, whoſe ſtems are hard, to ſeed and multiply; whereas the ox crops thoſe thick ſtems, and thereby deſtroys by degrees the coarſer herbage. Hence it is, that, after ſome years, the herbage where a horſe has lived becomes coarſe; whereas that where the ox has fed becomes a fine paſture.

CHAP. IV.

Of the Propagation of Cattle; Care of the Cow whilſt pregnant, and Management of the Calf till fit for Slaughter, or for Work.

SPRING is the uſual ſeaſon for cows to be in heat. In this country, moſt of them admit the bull, and become pregnant, between the middle of April and the middle of July. Some indeed are more forward, and others more backward in their heat. They go nine months, and calve at the beginning of the tenth; conſequently the regular ſeaſon for calves is from the middle of January to the middle of April: but there is no ſcarcity of them during the whole ſummer, autumn being the time when they are leaſt abundant. The tokens of the cow's heat are not at all equivocal: it is known by her frequent lowings, which are alſo more violent than at other times: ſhe leaps on cows, oxen, and even bulls; and the vulva is inflated ſo as to project outward. The time of this ſtrong heat ſhould be particularly noticed, and the bull ſhould be brought

to her then; for if ſhe be ſuffered to cool, ſhe will not ſo certainly retain afterwards.

The bull, like the ſtallion among horſes, ſhould be choſen from among the moſt beautiful of the ſpecies, and between the age of three years and ten, as before obſerved; but the nearer he is to three, the greater will be his vigour. He ſhould be large, well-made, and in good plight; his eyes ſhould be black, his look proud, his forehead broad and curled, his head ſhort, his horns thick, ſhort and black, his ears long and ſhaggy, his muzzel large, his noſe ſhort and ſtrait, his neck thick and fleſhy, his ſhoulders and breaſt broad, his reins firm, his back ſtrait, his buttocks ſquare, his tail high-placed, long, and full of hair, his thighs round and well truſſed, his legs thick, ſhort-jointed, and full of ſinews, his knees round, big, and ſtrait, his feet far aſunder, not broad, nor turning in, but ſpreading eaſily, his hoof long and hollow, his hide pliable, the hair of all his body thick, ſhort, and ſoft as velvet, and his walk firm and ſteady.

The cow ſhould be high of ſtature, her horns well ſpread, fair and ſmooth, her forehead broad and ſmooth, her body long, her belly round and large, and her udder white, not fleſhy, but large and lank, with only four teats; theſe having been experienced to yield the moſt milk. She ſhould alſo be young; and ſome hold it to be moſt adviſeable for her to be of the ſame country as the bull, and as near as can be of the ſame colour.

The cow reaches the age of puberty at eighteen months, and the bull at two years; but though they are at that age capable of generating, it is adviſeable not to ſuffer them to copulate under three years. The time of their greateſt ſtrength is from three to nine years, after which the beſt way of diſpoſing of them is by fattening them for ſlaugh-

ter. As they acquire the greateſt part of their growth in two years, the duration of life with them, as with moſt other ſpecies of animals, is nearly ſeven times two years; and accordingly we ſeldom find them live above fourteen or fifteen.

Cows often retain at the firſt, ſecond, or third time of covering; and when they are pregnant, the bull refuſes to cover them again, whatever appearance of heat there may be in them. Indeed, their heat generally ceaſes almoſt immediately after they have conceived, and they themſelves will not then ſuffer the bull to approach them.

Cows require greater care when pregnant than at other times; particularly, they ſhould not then be ſuffered to leap over hedges, ditches, &c. or to do any other thing by which they may ſtrain themſelves; for they are ſubject to abortion: conſequently they muſt not by any means be uſed for draught whilſt in that condition; but they ſhould then be put into the richeſt paſtures, provided they be not too moiſt or fenny, and for ſix weeks or two months before they calve, they ſhould be fed more plentifully than uſual; giving them in the ſummer-time graſs in the cow-houſe, and in the winter bran, lucerne, ſainfoin, burnet, &c. During this time they muſt not be milked, that fluid being then abſolutely neceſſary to the nouriſhment of the fœtus. Some cows, indeed, do not yield any milk for a month or ſix weeks before they calve; but thoſe which have milk to the time of calving are both the beſt mothers and the beſt nurſes; though it is generally bad and in ſmall quantity. The ſame care and cautions muſt be obſerved at the delivery of the cow, as at that of the mare; or rather more, the former ſeeming to be on this occaſion more ſpent and weakened than the latter. One indiſpenſable point is, to put her in a ſeparate ſtall, where ſhe muſt be kept warm, at her eaſe,

and on good litter. She muſt be well fed for ten or twelve days after ſhe has brought forth, with ground beans, corn, or oatmeal, diluted with water in which ſalt has been diſſolved, and with lucerne, burnet, ſainfoin, or good graſs, thoroughly ripe. By this time ſhe is uſually recovered, and may therefore by degrees be put to her common way of living, and turned into the paſture; obſerving not to take any milk from her during the two firſt months, that the calf may thrive the better; and beſides, the milk is not then of a good quality*.

As ſoon as the young calf is born, whilſt the mother licks it, or to excite her to do ſo, it is right to ſtrew over it a couple of handfuls of ſalt and crumbs of bred mixed together. This licking ſtrengthens the calf, or at leaſt clears it of all filth, which could not be removed by any other means, becauſe the young creature is then too tender to be handled without danger; and at the ſame time it ſhould be made to ſwallow the yolk of a raw egg, likewiſe to give it ſtrength.

The young calf ſhould be left with its dam during the firſt five or ſix days, eſpecially if it be in winter, in order that it may be kept conſtantly

* Good milk is neither too thick nor too thin; its proper conſiſtence is, when a ſmall drop preſerves its ſpherical form without ſpreading: it muſt alſo be of a delicate white; that with a yellow or blue caſt being of little value. The taſte of it muſt be ſoft, without any bitterneſs or acridity; it muſt have a good ſmell, or none at all. It is better in the month of May, and in ſummer, than in winter; and for it to be perfectly good, the cow muſt be of a proper age, and in good health. The milk of heifers is too thin; and that of old cows too oily, and in winter-time too thick. Theſe different qualities of milk have relation to the butyrous, caſeous, and ſerous parts of which it conſiſts. Milk too thin abounds too much with ſerous particles; that which is too thick has few or none of theſe particles; and the too oily has not a proper portion of butyrous and ſerous particles. The milk of a cow when bulling is not good; nor that when the creature is near, or juſt paſt, the time of her calving. *Buffon, Nat. Hiſt. du Bœuf.*

warm, and ſuck whenever it pleaſes; and at the end of this time, by which it will have gathered ſtrength and have grown viſibly, it muſt be tied up in a ſeparate pen at a little diſtance from her, that it may ſuck only when the keeper thinks proper; for it would exhauſt the cow if left continually with her. Two or three times a day will now be often enough for it to ſuck; and when it has done ſucking, it muſt be led back to its pen and tied up as before. After the mother is returned to paſture with the other cows, the calf ſhould ſtill be kept in the cow-houſe, and there made to ſuck twice day before its dam goes out.

If it be intended to fatten the calf ſpeedily, and at the ſame time render his fleſh fine and delicate, he ſhould have every day about half a dozen raw eggs, and crumb of bread boiled in milk. This, in four or five weeks time, will render his fleſh excellent. Calves intended for the butcher ſhould therefore not ſuck above thirty or forty days; but thoſe deſigned for keeping ſhould be left with the dam two months at leaſt, becauſe the more they ſuck, the ſtronger and larger they will be. The beſt for bringing up are thoſe that have been calved in the months of April, May and June; for thoſe which come later ſeldom acquire vigour enough to enable them to bear the inclemencies of the enſuing winter; cold making them droop, and often killing them. Thus calves deſigned for keeping ſhould be weaned at two, three, or four months: but before they are taken wholly from ſucking, a little fine graſs, or chopt hay, ſhould be given them from time to time, to accuſtom them to this new aliment; after being uſed to which, they muſt be never ſuffered to come near their dam; either in the ſtall or paſture. They themſelves ſhould be ſent to paſture every day, and remain there from morning to evening during the ſummer: but when

the cold of autumn begins to ſet in, they muſt not be let out till late in the morning, and ſhould be brought back early in the evening; and during the winter, the cold of that ſeaſon being extremely detrimental to them, they muſt be kept very warm in a cloſe cow-houſe, be well ſupplied with water, have ſainfoin, lucerne, burnet, &c. mixed with their common graſs, given them in a cow-houſe, and be let out only when the weather is very fine. A great deal of care is neceſſary to bring them through the firſt winter, which is the moſt dangerous period of their lives: for if they ſurvive this, the following ſummer will ſtrengthen them ſo that they will have nothing to fear from the cold of a ſecond winter.

It ſometimes happens that a calf is troubleſome to rear, becauſe it will not readily take the teat, but muſt have it held a conſiderable time in its mouth before it will ſuck; and likewiſe ſome ſhow for a long while a reluctance to ſuck at all, which is a ſign of their having pimples under the tongue; a diſorder to which young calves are ſubject, and which is eaſily cured by cutting them off with a pair of ſciſſars, and waſhing the wound with vinegar and ſalt: others rub them with hog's lard and ſalt pounded very fine.

In Spain, and ſome other countries, they place near a young calf in a cow-houſe one of thoſe ſtones called *ſalegres*, which are found in the mines of rock-ſalt: by licking this ſalt-ſtone whilſt its dam is at the paſture, it becomes ſo hungry and thirſty, that when the cow returns, the calf eagerly ſeizes the teat and ſucks his fill; and by this means he fattens and thrives much faſter than thoſe to which no ſalt is given.

The clods of curdled milk which are found in the third and fourth ſtomach of a ſucking calf,

are, after being dried in the air, the rennet made uſe of for curdling milk. The longer it is kept the better it is: and a very little of it is ſufficient to turn a large quantity of milk, as is well known to all who keep dairies.

As to the reſt, the management of milk and dairies is a ſubject ſo generally and ſo well underſtood, that it might be needleſs for me to enlarge upon it here, any farther, perhaps, than juſt to obſerve in general, that the dairy ſhould be kept extremely clean and well aired, at a diſtance from all diſagreeable ſmells of any kind whatever, and that it ſhould be ſo ſituated as to be of as equal a temperature as poſſible during the whole year, and therefore open to the north in ſummer, and to the ſouth in winter. The dairy-maids ſhould not only be clean in their perſons, but alſo ſuch whoſe perſpiration is not rank. The veſſels in which milk is now kept are generally lined with lead, becauſe it is a ſubſtance that cleans eaſily: but great care ſhould be taken that the milk do not remain in any leaden veſſel till it contracts the leaſt degree of acidity; for if it does, it ſoon diſſolves part of the lead, a very little of which will be of extremely bad conſequences to health, by occaſioning the moſt dangerous diſorders in the ſtomach and bowels, and often depriving people of the uſe of their limbs, as is daily ſeen in painters, and in thoſe employed in making white-lead.

CHAP. V.

Of the Diſeaſes of Horned Cattle.

THE treatment, as generally practiſed, in the ſeveral diſeaſes of horſes is, in ſimilar caſes, ſo applicable to the whole ſpecies of animals commonly diſtinguiſhed by the appellation of Horned Cattle, that little remains to be added here, unleſs it perhaps be, to point out ſome few particulars more peculiarly relative to the management of theſe laſt. The Romans paid very great attention to them, as ſharing with man the labours of the field; and as the climate of Italy is more kindly than that of England, ſurely whatever care was neceſſary there, cannot be leſs requiſite here. The writers of that country may therefore properly become our guides again on this occaſion.

Nature has cloathed with thick furs, or warm covering, ſuch creatures as ſhe intended to be expoſed to the ſeverity of the cold: but as cattle are not ſheltered with ſuch defence, I really think it cruel to expoſe them too much to the inclemencies of the winter, as many among us are apt to do*. Such was not the practice of the Romans, who very expreſsly enjoin, that the ox, in particular,

* For, notwithſtanding the very ſtrong arguments uſed by M. de Buffon, in ſupport of his opinion, that theſe creatures are original natives of theſe climates; ſuch as, in particular, that they are not found beyond Armenia and Perſia in Aſia, and Egypt and Barbary in Africa, (for he looks upon the buffalo, the aurock, and the biſonet, as creatures of a different ſpecies); I cannot but incline here to think ſomewhat differently from that great man, and that principally for this obvious reaſon: nature, as is evident, throughout the whole creation, gives to every animal a covering ſuited to the climate ſhe intends it for; and that of the ox is plainly calculated for a warm region. It therefore ſeems to me not improbable, that our black cattle came originally from ſome more ſouthern part.

be defended from the cold by a warm ſtable, and if it can be done, that there be a fire in it, which both Vegetius and Columella (*a*) declare to be of great advantage to this animal, as he thereby breathes a dry air, which carries off not only the exhalations from his own body, but alſo other noxious vapours. According to them, the manger ſhould be ſo contrived that their food be not loſt among their feet; and their ſtalls ſhould be placed on dry ground, with a gentle ſlope to carry off their urine, and kept conſtantly clean with dry litter, eſpecially for the labouring ox. How different from theſe directions is the condition of too many of our farmers' yards where the cattle often ſtand knee-deep in dirt!

When the ox returns from labour, his neck ſhould be waſhed, and rubbed for a long time; his whole body too ſhould be freed from clay or dirt, eſpecially his feet, which ſhould be well waſhed.

In ſummer, it is proper that cattle ſhould ſtand in cool ſhades during the heat of the day, and in the night in the open air; for they contract as many diſeaſes by ſuffering too great heat, as by being expoſed to too much cold.

It is of great benefit to them to give to each, about once a week, a raw egg, and ſome ſalt in a pint of wine or ale; and to this may likewiſe be added bruiſed garlic, vervain, and rue.

Cattle do not require the cleareſt water, nor are they very much hurt by it if it is dirty; nevertheleſs, it is the duty of the perſon who attends them, to ſee that they drink the beſt water, and ſuch as is clean, and that they be well fed. There is no danger of their over-feeding themſelves; for when nature is ſatisfied, they lie down and chew the cud. Labour breaks, heat vexes, and cold pe-

(*a*) *Lib. III. c. i.*

netrates an animal that is empty and exhauſted, ſooner than one that has been well fed: and ſurely no man will grudge them a ſufficient, plentiful allowance of food, who conſiders how far the price of oxen which periſh through want, exceeds the expence of that food.

If oxen are put upon running at their full ſpeed, or if they are otherwiſe over-fatigued, at any time of the year, but eſpecially in the ſummer, either they contract thereby a looſeneſs, which proves pernicious to them, or ſlight fevers: for this animal, being naturally ſlow, and rather adapted to eaſy labour than that of ſwift motion, is grievouſly hurt, if forced to go beyond his ſtrength.

Neither ſwine nor hens ſhould come near their cribs; for when an ox has ſwallowed hen's dung with his food, he is preſently tormented with violent pains in his belly; and when he ſwells with it he dies. In caſe of his having ſwallowed any, the beſt way is to give him three ounces of parſley-ſeed, half a pound of cummin-ſeed, and two pounds of honey, mixed together, and poured warm down his throat, to force him to walk, and to rub him heartily till the draught moves his belly. The aſhes of any wood well ſifted, boiled in a ſufficient quantity of oil to render them liquid, and then poured down the ox's throat, will alſo be of great benefit againſt the bad effects of this ſort of dung.

But if an ox ſwallows hog's dung, or more eſpecially the filth which a ſick ſow has vomited, he is preſently ſeized with ſo contagious a diſeaſe, that it ſpeedily affects a whole herd. When therefore there is the leaſt ſuſpicion of this diſtemper, the cattle muſt be removed and ſeparated to paſtures where none ſuch have been fed, that ſo they may not hurt one another: for by feeding they infect the graſs, and the water by drinking of it. An ox, though otherwiſe in perfect health, may periſh by

the ſmell and breath of the diſeaſed blowing upon him. When this happens, the dead carcaſe muſt be carried to a diſtance, and buried deep, leſt the ſound be infected by it, and the negligence of the owner be imputed (as is uſually done by fools, ſays Vegetius) to the divine diſpleaſure. In the caſe here ſpoken of, he recommends half an ounce of ſquills ſliced thin, infuſed in a pint of wine, with about two ounces of ſalt, to be given every morning to each creature thus infected. But as infectious diſeaſes will be the profeſſed ſubject of the laſt part of this work, I ſhall not enlarge upon them here, any farther than juſt to mention the ſimilitude which Mr. Oſmer thinks there is between the diſtemper in horſes and that amongſt oxen.

"To the beſt of my obſervation," ſays he, "what is called the diſtemper amongſt the horned "cattle, is exactly correſpondent to the diſtemper "amongſt horſes; the ſymptoms in each animal "being ſimilar in all reſpects. The diſcharge from "the noſtrils, &c. of the cow in theſe fevers, "about the nature of which, and of this diſtemper, "there has been abundance of fine writing, is "nothing elſe but an extravaſation of the ſerous "particles of the blood, the effect of inflamma-"tion; and therefore in obedience to the attempts "of nature, our buſineſs is to invent all the methods "we can to carry off this extravaſated ſerum; and "inciſions made in the ſkin of the cow, as is done "for horſes with the ſame ſort of fever, pro-"duce in twenty-four hours a naſty, fœtid, puru-"lent matter. By a number of theſe drains the "parts will be unloaded, and the animal relieved, "as they do in all inflammatory fevers amongſt "horſes; and I dare ſay will too amongſt the cows, "anſwer nearly the ſame end and purpoſe as a cri-"tical abſceſs. But when no critical abſceſs hap-

" pens, or no artificial drains are made uſe of, the " natural ones not being ſufficient to carry off the " extravaſated ſerum, the viſcera and more noble " parts are, in time, affected, the blood and juices " deviate by degrees into a ſtate of putrefaction " and corruption, and the animal dies a moſt " wretched death.

" If any man object and ſay, this diſtemper of " the cows is infectious, and therefore it is of the " putrid, and not of the inflammatory kind; I " anſwer, that it does not appear to be infectious, " becauſe ſome cows, amongſt a number of in- " fected ones, have eſcaped it. But allowing it to " be of the putrid or peſtilential kind, and to ariſe " from the air, infection, or both, theſe artificial " drains made in the ſkin will be very proper, be- " cauſe they will anſwer in ſome meaſure the ſame " end as the bubo or critical impoſthume befalling " the human ſpecies in peſtilential diſorders, if they " are properly managed. And here it may be ob- " ſerved, that when diſtempered cows have eſcaped " death, it has been generally owing to ſome cri- " tical abſceſs; various inſtances of which I have " ſeen.

" To theſe artificial drains ſhould be added the " uſe of cooling ſalts, and laxative glyſters, if " needful.

" It is neceſſary ever to remember, that bleeding " the horſe or cow will be wrong, and muſt do " harm, when a diſcharge from the noſtrils, &c. " is begun, becauſe it is contrary to the effort of " nature; and ſo it is when there is any ſwelling that " is tending to matter, which kinds of ſwellings " can be diſtinguiſhed by the ſkilful only."

Indigeſtion is very hurtful to oxen, and is known by the following ſigns: frequently belching, loathing of their food, noiſe in the belly, heavy eyes: the creature neither chews his cud, nor licks him-

ſelf as uſual. In this caſe, pour down his throat two gallons of water as warm as he can bear it, and ſoon after give him about thirty leaves of colewort boiled in water, and afterwards ſoaked in vinegar; and he muſt abſtain from food for one day. Neglected indigeſtion brings on colics, which is to be treated, as the ſame complaint is in horſes.

I ſhall here mention *hoving*, a diſorder which is almoſt peculiar to the horned cattle.

This diſorder proceeds from a too ſudden ferment in their green ſucculent food, whereby the elaſtic air let looſe by the fermentation, but confined by the hard fæces which do not ſpeedily enough give way to it, becomes highly acrid, like the gaſs ariſing from fermented liquors, which often proves mortal to thoſe who breathe it. The method of cure ſhould therefore be, clearing the great gut of hard excrement, injecting a ſtimulating glyſter, and giving cooling things internally. This agrees with what M. Bourgelat propoſes, when he ſays (*b*), "Thus it is, for example, that with nitre "given in half a glaſs of brandy, and often even "with emollient glyſters only, we have ſaved con-"ſiderable numbers of oxen ready to expire in "their paſtures, after vain endeavours had been "uſed to eaſe them, according to the common "practice, by many inciſions made in the ſkin, "doubtleſs with an intention to diſengage the cel-"lular membrane from the air that filled it, and "of which carminatives would inevitably have in-"creaſed the diſorder, and haſtened the death of "the beaſt."

Farmers are apt to fall into a great error when their cattle have got the better of this diſorder; and that is, by letting them become coſtive again, and conſequently liable to a return of the ſame

(*b*) *Ecole vétérinaire; Matiere Médicale, p.* 112.

danger when they next feed on ſucculent plants; whereas were they to continue to give them green food after a purging has been once brought on, no farther inconvenience could enſue. Immerging them in cold water when thus diſtended brings on an immediate purging, and thereby ſaves their lives.

The mouths and tongues of horned cattle are ſubject to the ſame ſorts of ſwellings as thoſe of horſes, and alike productive of an inability to eat.

Theſe ſhould alſo be cut off with a knife or ſciſſars, and then rubbed with ſalt and let heal. If they have no appetite to their food, and yet no ſigns of indiſpoſition appear, it will be proper to rub their chops with ſalt and garlic beaten together, or with ſome other ſtimulating ſubſtance.

The cure of internal diſeaſes in cattle is ſo nearly the ſame as for horſes, and the doſes of their medicines ſo much alike, that a repetition of them here ſeems needleſs. The cauſes of their lamenefſes, and the methods of curing them, are alſo ſimilar; and the feet of both require ſo nearly the ſame cutting and care of the hoof, that the leaſt degree of intelligence will ſuffice to vary them properly.

The caſtration of calves is likewiſe performed in the ſame manner as that of horſes.

BOOK IV.

Of SHEEP.

CHAP. I.

Of the Qualities and different Kinds of Sheep.

"SHEEP have golden feet, and wherever they ſet them, the earth becomes gold," ſay the Swedes, by way of expreſſing their high eſtimation of this animal. In effect, there is not any one domeſtic creature which yields greater profit to man than ſheep do. Their fleſh, their milk, their ſkin, their inteſtines, their dung, in ſhort, every part of them, is neceſſary for ſome uſe or other, and turns to good account.

Though their fleſh and milk furniſh us with variety of excellent food, yet their wool is the chief object, eſpecially to a commercial nation; for of it is formed, in Britain, the ſtaple-commodity to which we owe the wealth and grandeur that render us the arbiters of power in Europe.

At the ſame time that this creature is the moſt uſeful, it is alſo, in itſelf, one of the moſt defenceleſs againſt enemies: providence intending, as it would ſeem, that it ſhould owe its very exiſtence to our care, and be entitled to our protection, in return for the means of enjoyment and wealth which it affords us: for it not only wants protection but care alſo, more than any other domeſtic animal. Sheep are of a very weakly conſtitution; much fatigue exhauſts them; they can ill bear ex-

tremes of heat or cold; their diſeaſes are many, and moſt of them contagious; and their yeaning is attended with difficulty and danger.

They are ſaid to be ſenſible to the charms of muſic, ſo as to feed more aſſiduouſly, to be in better health, and to fatten ſooner by the ſound of a pipe: but perhaps it may be more rightly thought, that muſic ſerves to amuſe the ſhepherd's tedious hours, and even that the origin of that art was owing to this ſolitary life.

Sheep love their keepers and thoſe who take care of them; they follow them, and obey their voice. It muſt however be obſerved, that if the ſhepherd has not a watchful eye over them, one or other of his ſheep may eaſily ſtray from the reſt of the flock, wander into places it is unacquainted with, and there fall down a precipice, or tumble into a hole or ditch, eſpecially if the creature has been frightened, which ſheep very eaſily are; for when they have once loſt their way, they run ſtrait on, without ſtopping, and always directly againſt the wind, particularly if it blows hard, and they chance to be in an open place, a wide road, or on the borders of the ſea. They are very fond of light, and never thrive well in dark places; and ſuch is their fondneſs for ſociety, that frequently a ſheep left alone will pine away, become emaciated, and quite loſe his ſtrength.

The re-eſtabliſhment of the beſt kinds of ſheep in England, and greater care of their fleeces, are objects well deſerving the attention of government: for, notwithſtanding all our boaſted improvements, it is certain that the quality of our wool in general has been on the decline for ſome time paſt*. Theſe

* Mr. Liſle, whoſe judgment and veracity in matters of this kind ſtand unimpeached, tells us, in his *Obſervations on Huſbandry*, article *Sheep*, that, even ſo late as his time, and he has not been dead many years, the clothiers complained that our Herefordſhire wool, and particularly that of our great ſtaple, was no longer ſo fine as formerly.

uſeful creatures, which were the chief wealth of former ages, become of ſtill greater value as art and induſtry increaſe among us. One cannot, therefore, but be aſtoniſhed at the indifference into which this nation has fallen with regard to her ſheep, and eſpecially too at a time when every other country is exerting its utmoſt endeavours to improve its breed, and the manner of managing its flocks. At this very inſtant, we are ſtrongly called upon to be particularly attentive to this great object, by the meaſures which the French are indefatigably purſuing to improve the breed of their ſheep, by introducing thoſe of every country where they excel.

We have no particular accounts of what our ſheep were in antient times; though we may preſume that our wool was always ſought for by foreign manufacturers, becauſe our hiſtory informs us, that the duty paid on the exportation of it was a conſiderable article of the royal revenue*.

If we take a general view of the whole of England, we ſhall find, that the temperature of our climate, and the quality and almoſt perpetual verdure of our paſtures, render it one of the beſt ſituated countries in the world for raiſing flocks of ſheep. We are free from every diſcouraging circumſtance with regard to them. We have no armies of inſects or reptiles that are enemies to them; no wolves, nor any other animal whoſe nature is to prey upon them, if we except foxes, of which again the numbers are ſcarcely more than

* In former times, "the wealth of the nobility, gentry, and "monaſteries conſiſted chiefly in wool, which alſo then made the "bulk of private property at home. It was at the ſame time the "prime article in commerce. Aids to the crown was granted therein. "It ſupplied the demands for the ſupport of armies, the payment of "ſubſidies, and all other expences incurred on the account of the pub-"lic in foreign parts," ſays the learned Dr. Campbell, in *vol. II. p.* 152, of his excellent *Political Survey of Great-Britain.*

ſuffice to give proper healthy exerciſe to men, who might otherwiſe indulge themſelves in too much eaſe. Our froſt and ſnow are generally of ſhort continuance. Our extenſive downs, our hills, the ſides of our mountains, and even our ſteep rocks, abound in fine graſs, which feeds a ſmaller breed of ſheep; whilſt our richer paſtures of Lincolnſhire and Ely maintain thoſe of a larger ſize: and we are ſurrounded with a ſea-coaſt, the air of which is thought to be particularly favourable to the health and thriving of ſheep, as well as to the fineneſs of their wool. The air of the ſea is found to be ſo wholeſome and favourable to ſheep, that the huſbandmen who live at a diſtance from that element, find their advantage in recruiting their flocks with ſheep from near the ſea.

Columella (*a*) mentions the ſeveral kinds of ſheep moſt in repute in his days, and gives an inſtance of the judgment of his uncle, M. Columella, an excellent huſbandman, in mending the breed of his own ſheep, by coupling with them rams brought from Africa: and indeed it is highly probable, that the excellence of the Spaniſh wool, now ſo juſtly valued, took its riſe from combinations of this kind during the long reſidence of the Moors in that kingdom.

Don Pedro IV. King of Caſtile, was the firſt prince who introduced the good kind of ſheep which they now have in Spain, by bringing thither the Barbary breed. In two ages, they began to decline, when Cardinal Ximenes reſtored the breed, by procuring a freſh ſupply of rams from Barbary, that is to ſay, of rams bred by the Arabians, thereby exciting amongſt the people an emulation which continues to this day; and by fixing their attention to this object, which

(*a*) *De re ruſtica, lib. VII. c. ii.*

has hitherto preſerved the goodneſs of the Spaniſh wool*.

The memoirs of the Royal Society of Agriculture at Rouen ſay (*b*), that in the fifteenth century, our Edward IV. obtained a number of this race from the king of Caſtile, which throve very well, and laid the foundation of the excellency of our wool. Henry VIII. and Queen Elizabeth, contributed much to its perfection, by directing the attention of government to this great national concern. Men of diſtinguiſhed judgment and integrity were commiſſioned to ſuperintend the proper diſtribution and future care of the Caſtilian ſheep. How this commiſſion has ſince come to be neglected, I know not. Theſe commiſſioners ſent two Caſtilian ewes and one ram to every pariſh in which the paſture was thought proper for them; and the care of them there was intruſted to the yeomen and moſt conſiderable farmers, to whom peculiar privileges were at the ſame time granted on this account. Farther, in order the ſooner to have a quantity of good wool, the fineſt native ewes were alſo ſingled out, and covered by the Spaniſh rams, from whence proceeded a baſtard race, much ſuperior in quality to thoſe of that country. Shepherds were taught the art of managing ſheep, and written inſtructions were given them, which, I am ſorry to ſay it, are now loſt†.

* The fineſt of the Spaniſh wools are thoſe of Caſtile, which are divided, according to the places of their growth, into Segovians, Leoniſas, Segovias, Sorias, and Molinas. The wools of Arragon are leſs fine: theſe are Albarazins, fine and middle, the Campos, and the black wool of Saragoſſa. Portugal and Navarre produce alſo fine wools. Our imports of wool from Spain have generally been of the prime of the Caſtilian, uſed in making our fineſt cloths.

(*b*) *Tome II p.* 58.

† Dr. Campbell, in his very valuable *Political Survey of Great-Britain*, *vol. II. p.* 151, treats the whole of this account of Edward the Fourth's, or any other of our kings, procuring ſheep from Spain, to renew or improve our breed, as a mere fiction, invented by P. Chomel, in his

At this time began the cuſtom of folding them in the warm, kindly weather; and the ſame practice was afterwards continued during the winter. The abode of the Spaniſh ſheep in England altered by degrees the nature of their wool: it became much longer, but did not continue ſo fine as before; owing, probably, to the difference of the paſture. Our wool is however whiter and cleaner than that of Spain, through the great care which the Engliſh take to keep their flocks free from filth; an attention hitherto neglected by the Spaniards.

Dictionnarie Oeconomique, to ſhow how eaſily ſuch a ſcheme might be executed in France; and I confeſs that the Doctor's arguments ſeem to me next to abſolutely concluſive againſt it: indeed, if it reſted ſolely upon the credit of Father Chomel, I ſhould not heſitate a moment to pronounce him right. But as it comes to me from an infinitely more reſpectable quarter, from a ſociety juſtly revered by the whole world, ſome of whoſe members are nobles of the firſt diſtinction, and others highly eminent for their great knowledge, I cannot ſuppoſe them to have taken this upon truſt from the Dictionary-writer, or to have advanced it as a fact, without better authority than his for ſo doing. The Gaſcon and Norman Rolles, publiſhed by the late Mr. Carte, are a proof, not to mention ſeveral more which might be inſtanced, that there may ſtill be in France, and particularly in thoſe parts of it which once were ſubject to us, records relative to our hiſtory which we are yet unacquainted with; and it is not impoſſible that the anecdote here alluded to may be one of them, even though the name of the prince, and the date, may be miſtaken. However, I ſpeak here only from ſurmiſe. Let me now uſe an argument which may poſſibly be more ſtriking. The Doctor himſelf, adopting the opinion of thoſe who think that the Northern parts of this iſland were peopled from Germany, the Southern from Gaul, and the Weſtern and Ireland from Spain, ſays, p. 150, "it cannot be doubted, that as the inhabitants of "Britain and Ireland, ſo the ſheep alſo came originally hither from "ſome other country, and moſt probably, for many reaſons that "might be aſſigned, from Spain. This ſeems to be confirmed by "the breed being the ſame in both iſlands, and having a great reſem-"blance unto thoſe of Spain." Now, with ſubmiſſion to the Doctor, to whoſe opinion I ſhall ever pay a ſincere deference, is it any way unreaſonable to ſuppoſe, that the breed of ſheep imported into this iſland at the time of its being firſt inhabited, might have degenerated, in the courſe of many centuries, ſo as to ſtand in need of a kind of renewal; and, in that caſe, could there be any more proper way than applying to the country from which the good breed firſt came? No matter which of our princes did it; or even whether it was not done at all. Some ſuch expedient would be of ſervice now to improve our preſent race.

To the above mixture of the Spaniſh ſheep with the natives of this iſland, and the greater or leſs degeneracy of their poſterity, is owing that we now ſee in England three ſorts of ſheep; the common, which are very ſmall; the baſtard, which are of a middle ſize; and the ſtrong, fine and plentiful breeders.

The Glouceſterſhire, particularly thoſe of Coteſwold, the Herefordſhire, Shropſhire, and the iſle of Wight ſheep, yield the fineſt wool of any in England: they are ſhort-legged, and have commonly a black forehead or a black head. The Warwickſhire, Leiceſterſhire, Buckingham, and Lincolnſhire ſheep, are the largeſt and beſt ſhaped, and their wool is the deepeſt of any we have, but not ſo fine as that of the former. The Yorkſhire ſheep are likewiſe pretty large, but their wool is coarſe: and in general, that of all the Northern counties is long, but hairy. The Welſh ſheep are the ſmalleſt of all, and their wool is by no means the fineſt; but in return their fleſh is excellently well flavoured. The wool of the Caſtilian ſheep is undoubtedly much finer than that of even the beſt Engliſh; but it is leſs in quantity, chiefly becauſe the ſheep themſelves are ſmaller: though there are in ſome parts of Spain ſheep larger and covered with more wool than any of the Engliſh. For their wool, the Engliſh are certainly the next beſt to the Spaniſh.

The Iriſh wool in general, but eſpecially in Limerick, Kilkenny, Kerry, Waterford, Cork, and ſome other counties, is of the fine long combing kind, ſcarcely ſurpaſſed by any of the ſort in England. This is the wool that is moſt acceptable in foreign parts, where they have ſhort wool enough of their own, or may eaſily procure it from Spain and Portugal.

In the laſt century, the Dutch brought from the

Eaſt-Indies a race of tall ſheep, long and thick in the body, with wool proportioned to the ſtature of the animal. This valuable breed has ſucceeded beyond expectation in the iſland of the Texel and in Eaſt-Frieſland. One of theſe ſheep yields a fleece of from ten to ſixteen pounds of a fine ſilky wool, which the Dutch ſell for Engliſh wool.

The Flemings alſo procured ſome of the ſame ſort of ſheep, which they breed about Liſle and Varneton, where they thrive well, and are known by the name of Flemiſh ſheep.

The largeſt of theſe ſheep are ſix feet long from head to tail. In Holland, they give four lambs in the year; whereas in Flanders they bring but two, of which the ſtrongeſt is reared in order to keep up the flock. Each of theſe likewiſe yields as far as ſixteen pounds of wool. They would be preferable to thoſe of the Texel, if the ſame care was taken of them, and if they were more numerous than they are. Moſt of the ſheep about Liſle are a baſtard race, proceeding from the Indian rams and the ewes of the country, and yield from ſix to ten pounds of wool, little inferior to that of the true breed. Their fleſh is well-taſted and wholeſome: a carcaſe of it weighs from ninety to a hundred and twenty-five pounds, and yields about thirty pounds of ſuet. They are in themſelves the fineſt, largeſt, and ſtrongeſt of any ſheep. They require, indeed, a larger quantity of food; but on the other hand they are indifferent in regard to its quality: they are eaſily taken care of, naturally healthy, and if ſick eaſily cured. Their wool differs little from that of England, only it does not ſo eaſily take fine colours. It is not ſo fine as it might be, for ſeveral reaſons, the principal of which are, that they are ſeldom folded; that they are kept too warm in their houſes during the winter: that the litter is not changed often enough, whereby it not only

dirts, but alſo gives a bad ſmell to their wool; and that ſufficient care is not taken to keep them from hedges, buſhes, and brambles, which not only tear off their wool, but ſcratch their ſkin, which, if not healed in time, degenerates into the ſcab.

The Swedes, after having tried in vain to mend the breed of their ſheep in the reign of Queen Chriſtiana, ſet the ſame deſign again on foot in the year 1725. They imported into their country a number of the beſt kinds of ſheep from England and Spain, and put them under the management of ſkilful ſhepherds, to be treated according to their ſeveral natures. After the example of England, heretofore, they eſtabliſhed ſchools for training up ſhepherds, who were ſent from thence to the different parts of the kingdom; and thoſe ſchools are continued to this day. They put the foreign rams to their native ewes, and from thence proceeds a valuable baſtard race. By this care, Sweden now has, notwithſtanding the rigour of its climate, wool which nearly reſembles the Engliſh and Spaniſh. The French have, in ſeveral parts of their kingdom, numbers of ſheep of the true Spaniſh breed, and they multiply there exceedingly; ſo that, as the authors of the *Maiſon Ruſtique* obſerves(*c*), it might be eaſy for them, by following the method formerly practiſed in England, to eſtabliſh every where that race, which would yield twice or thrice as much profit as their own common ſheep, as well in point of ſize, of the goodneſs of their lambs and rams, of fruitfulneſs, and of milk, as of the quantity and quality of their wool and ſkins.

The provinces of Berry and Beauvais are thoſe in which the moſt and beſt ſheep in France are reared. Thoſe of Beauvais, and ſome other parts of Normandy, are the largeſt, and the fulleſt of

(*c*) *Tom. I. part I. liv. iv. c. 3.*

ſuet. In Burgundy, they are very good; but the beſt are thoſe that are fed on the ſandy coaſts of the maritime provinces of France. In Poitou, Provence, the neighbourhood of Bayonne, and ſome other parts of France, there are ſheep which ſeem to be of a foreign breed: they are ſtronger, larger, and have a great deal more wool than thoſe of the common breed. Theſe ſheep are alſo more prolific than the others; it being nothing extraordinary for them to have two lambs at a time, and to yean twice a year. The rams of this breed, engendering with the common ewes of the country, produce an intermediate breed, partaking of the two from which it proceeds.

Some think that the preſent Italian ſheep are the offspring of a mixture of the Aſiatic and the European kinds. But be that as it may, there are in the Breſſan (*d*), towards Mantua, ſheep whoſe wool is indeed coarſe, but of ſo quick growth that they are ſheared three times a year, namely, in March, in July, and in November. It is true, they would not yield ſo great a quantity of wool in cold countries; but in warm ones they will, every where; and yet they are of ſo robuſt a conſtitution, that they fear neither rain, cold, nor even hoar froſts, but will feed at all times in the open field, provided the ground be not covered with ſnow. They yield plenty of milk during four or five months of the year, and excellent cheeſe is made with it. Another kind of Breſcian ſheep, called baſtard ſheep, but for what reaſon I know not, bears ſhearing twice a year, and is much eſteemed, though ſmaller than the former. But the fineſt wool of all Italy proceeds from that kind of ſheep which the Breſcians call *gentili*, and of which numbers are fed in the Trentin, eſpecially about the villages of Ghede and Montechiaro: but as theſe

(*d*) *Ibid. tom. I. p.* 348.

ſheep are extremely difficult to rear and take care of, and as the fineneſs of their wool is owing to the climate and paſture of the country, they probably might not thrive elſewhere.

The wool of the Ruſſian, Poliſh, and Tartarian ſheep, is better than that of the common German ſheep; and accordingly the Swedes make uſe of it in their manufactures of cloth, ſtockings, &c.

All the above-mentioned ſorts of ſheep certainly form but one greatly-diverſified ſpecies, which in M. de Buffon's opinion (*e*) hardly extends beyond Europe: for as to thoſe long and broad-tailed creatures ſo common in Africa and Aſia, and to which travellers have given the name of *Barbary ſheep*, they ſeem to him to be of a different ſpecies from our ſheep; as do likewiſe the American vigonia and lama.

Daily experience proves that the European ſheep in ſome degree alter their very nature; for inſtance, in Lincolnſhire they are large, heavy, and ſlow in their gait. On the downs of Suſſex, Wiltſhire, and Dorſetſhire, they are ſmaller, more hardy, and fleeter; and in the mountains of Wales they are ſtill leſs of ſize, and ſo active as ſcarcely to be confined by any incloſures. If we extend our view farther, we ſhall find, that the kind which yields the ſofteſt and fineſt wool in Britain, when ſent to the Weſt-Indies, becomes hairy like a goat. It is alſo obſerved in North-America, that the quality of their wool depends much on the temperature and climate of the country: in ſome of the middle provinces, ſuch as New-York, the Jerſeys, &c. their wool is of ſo good a quality, that a ſample of it ſent hither ſome years ago ſold for as high a price as our beſt; although this was only from a common tobacco plantation, where no

(*e*) *Hiſtoire Naturelle de la Brebis.*

care had been taken of it ſince America was firſt ſettled*.

* The fact here alluded to is mentioned in *The Preſent State of America*, *p.* 142; allowed by Sir J. Dalrymple, in his *Political Eſſays*, *ſect. I. Colonies*, *p.* 263; and confirmed by a letter to the writer of this work from an eminent merchant in New-York, who ſays poſitively, "Our wool in general is *better* than the Engliſh: but how ſmall is the "quantity we raiſe! It is true, ſome late oppreſſive acts, as the "ſugar-act, ſtamp-act, and new duty-act on glaſs, paper, *&c.* raiſed "a ſpirit in the country for manufactories, and double the number of "ſheep; but I affirm, that our wool was not a quarter part ſufficient "for our conſumption. I have taken pains to get an account of the "number of ſheep of New-Jerſey; and as they were formerly taxed, "I believe it juſt, and that the whole number does not exceed one "hundred thouſand. Theſe, at an average, yield about 2 ¾ lb. "each, which is ſold for about fifteen pence ſterling a pound. This "quantity will be under 3 ½ lb. per head, for apparel and bed-clothes, "and not near ſufficient for their demand. The country-people, "indeed, mix linen-yarn in their cloth, which helps out, and makes "it very ſtrong; yet, though every pound is worked up, the towns, "villages, and iron-works, cannot be ſupplied, and depend on Eng-"liſh cloth and ſtuffs. I think Pennſylvania keeps ſtill fewer ſheep. "It is true Long-Iſland, and the iſlands in the Sound greatly exceed: "but then the northern parts of the colony of New-York keep much "fewer; ſo that, on the whole, they are not equal to Jerſey.

"I have found from experience that no farming is more profitable "than ſheep, and now keep an hundred and fifty on the ſame farm "where my predeceſſor kept but twenty-five. I eſtimate the profit "from eight to ten ſhillings a-head per annum, and this on land "that rents at two ſhillings ſterling per acre. I would willingly in-"creaſe my ſtock, but find my farm will not bear it; though, on "four hundred acres of arable and meadow land, I only keep beſides, "eighteen head of cattle, thirty hogs, eight horſes, and plough about "eighty acres for ſummer and winter grain. I winter, indeed, "thirty head more of young cattle, which I ſummer in the woods. "The ſmallneſs of this ſtock will ſurprize a Britiſh farmer: but our "fields do not yield like thoſe of England; owing to our cold ſprings "and hot ſummers, long droughts and heavy rains, bad huſbandry "and want of manure.

"To what I before ſaid of our not having a ſufficient quantity of "wool, I will now add the prices which I actually paid for manu-"facturing a piece of cloth, three quarters of a yard wide.

New-York Currency.	£.	s.	d.
"Spinning 23 ½ lb. of wool, at 3s. 6d. per lb.	4	2	3
"Weaving 34 yards of cloth, at 1s. - -	1	14	0
"Fulling, preſſing and dyeing 25 yards, at 1s. 6d.	1	17	6
"Wool, 23 ½ lb. picked and cleaned, at 2s. 6d.	2	18	9
	£. 10	12	6

"Which is 6s. 3d. currency, or near 3s. 4 ½d. ſterling per yard.

CHAP. II.

Of the Management of Sheep.

AS the ſize and welfare of the ſheep, and the goodneſs of their wool, depend much on the nature and quality of their paſture, this becomes an article of the utmoſt importance to the huſbandman, and therefore deſerves a particular inquiry.

In order to their being rightly managed, the owner ſhould be very careful what kind of ſhepherd he entruſts his ſheep to: for the ſhepherd not only accompanies them to the field, but ſhould alſo take care that they do not feed in improper places, improper, on account of the quality of the food and drink, as well as other dangerous circumſtances. He ſhould likewiſe be particularly attentive that no improper rams mix with the flock; to give immediate relief to thoſe that fall ſick, eſpecially in lambing-time, and for this reaſon he ſhould be well acquainted with their diſeaſes. In

"The cloth, after a few days wear, looked very indifferent. I "had it made up for myſelf, as moſt of the gentlemen here pique "themſelves in ſetting an example of wearing country-made cloth; "but we were under a neceſſity of buying Engliſh cloth for our negroes. "The reſtrictions being taken off our trade, we are returned to wear- "ing Engliſh cloth, and hope like cauſes will not oblige us to recur "to the ſame reſolutions. We are now convinced that we cannot hire "to make cloth under almoſt double what the Engliſh does coſt; "but at the ſame time farmers who have the labour done within "themſelves, and by this means employ the women, who would "otherwiſe be idle, will always make cloth for themſelves with ad- "vantage; eſpecially as it is ſaid to wear better: but we have not the "leaſt proſpect of making a yard for exportation."—This letter was written in December, 1773; the facts related in it may be depended on; and the writer of this work moſt ſincerely wiſhes, that the long and literal extract of it here given may tend in any ſenſe to rectify the miſtaken opinions now, unhappily, too prevalent. Such is his reaſon for inſerting it here.

ſhort, his preſence and care ſhould be ſo conſtant, that the ſheep ſhall obey him out of a kind of love. He ſhould be vigilant and circumſpect, govern them with great clemency, and ſays Columella (*a*), who ſtrictly enjoins the ſame rule to the keepers of all ſorts of cattle, be more like a captain and leader than a lord and maſter. When he threatens them it ſhould be with a loud ſhout and ſhaking his ſtaff at them: but he never ſhould throw any offenſive weapon at them, nor remove to any great diſtance from them; neither ſhould he lie down, or ſit down, but, unleſs he be going forward, he ſhould ſtand, to be the better able at all times to look around him, to ſee that neither the ſlow and big with young, whilſt they loiter, nor the nimble, whilſt they run before, be ſeparated from the reſt; leſt either a thief or a wild beaſt deceive the heedleſs inattentive guardian.

We find by Columella, that it was an early cuſtom to lead ſheep to far diſtant paſtures at different ſeaſons of the year; and the Spaniards have ſtill retained this practice, as will appear from the following abridgment of a judicious account of their manner of managing the royal flocks, tranſmitted by a gentleman in Spain to the late Mr. Peter Collinſon, F. R. S.

" There are two kinds of ſheep in Spain, name-
" ly, the coarſe-woolled ſheep, which remain all
" their lives in their native country, and which
" are houſed every night in the winter; and the
" fine-woolled ſheep, which are all their lives in
" the open air, and which travel every ſummer from
" the cool mountains of the northern parts of
" Spain, to feed all the winter on the ſouthern
" warm plains of Andaluſia, Manca, and Eſtrema-
" dura. It has appeared from very accurate cal-

(*a*) *Lib. VII. c. iii.*

" culations, that there are not fewer than five " millions of fine-woolled ſheep in Spain; and it is " reckoned that the wool and fleſh of a flock of " ten thouſand ſheep produce yearly about twenty- " four reals a-head, which we may ſuppoſe to be " nearly the value of twelve ſix-pences ſterling*.

" Special ordinances, privileges and immunities " are iſſued for the better preſervation and govern- " ment of the ſheep, which are under the care of " twenty-five thouſand men, who, as the Spaniards " expreſs it, clothe kings in ſcarlet, and biſhops in " purple.

" Theſe ſheep paſs the ſummer in the cool " mountains of Leo, Old Caſtile, Cuença, and Ar-

* Of theſe, but one clear a-head goes to the owner yearly; three ſix-pences a-head go yearly to the king, and the other eight go to the expences of paſture, tythes, ſhepherds, dogs, ſalt, ſhearing, &c. Thus the annual produce of five millions of ſheep, amounts to thirty-ſeven millions and a half of ſix-pences, a little more or leſs, of which about three millions and an half are for the owners, above fifteen millions enter into the treaſury, and ſeven millions and a half go to the benefit of the public. Hence it is that the Kings of Spain call their flocks, in their ordinances, *The precious Jewel of the Crown.*

Formerly, this jewel was really ſet in the crown; for a ſucceſſion of many kings were lords of all the flocks: thence that great number of ordinances, penal laws, privileges, and immunities which iſſued forth in different reigns for the preſervation and ſpecial government of the ſheep. Hence a royal commiſſion was formed under the title of The Council of the Grand Royal Flock, which exiſts to this day, though the king has not a ſingle ſheep. Various exigencies of ſtate, in different reigns, alienated by degrees the whole grand flock from the crown, together with all its privileges, which were collected and publiſhed in the year 1731, under the title of " Laws of the Royal Flock;" in a large folio, of about five hundred pages.

The wars and wants of Philip the Firſt's reign, forced that king to ſell forty thouſand ſheep to the Marquis of Iturbieta, which was the laſt flock of the crown.

Ten thouſand ſheep compoſe a flock, which is divided into ten tribes. One man has the conduct of all. He muſt be the owner of four or five hundred ſheep; ſtrong, active, vigilant, intelligent in paſture, in the weather, and in the diſeaſes of ſheep. He has abſolute dominion over fifty ſhepherds and fifty dogs, five of each to a tribe. He chooſes them, and chaſtiſes or diſcharges them at will. He is the *prepoſitus*, or chief ſhepherd of the whole flock.

" ragon. The firſt thing the ſhepherd does when the " flock returns from the ſouth to its ſummer-downs, " is to give the ſheep as much ſalt as they will eat. " Every owner allows his flock of a thouſand ſheep " twenty-five quintals of ſalt, which the flock eat " in about five months: they eat none in their jour- " ney, nor in their winter-walk. It is believed, " that if they ſtinted their ſheep of this quantity, " it would weaken their conſtitutions, and degrade " their wool. The ſhepherd places fifty or ſixty flat " ſtones at about five ſteps diſtance from each " other; he ſtrews ſalt upon each ſtone; he leads " the flock ſlowly through the ſtones, and every " ſheep eats to his liking. What is very remark- " able the ſheep never eat nor deſire a grain of " ſalt when they are feeding on land which lies on " lime-ſtone: and as the ſhepherd muſt not ſuffer " them to be too long without ſalt, he leads them " to a ſpot of clayey ſoil, and after a quarter of an " hour's feeding there, they march back to the " ſtones and devour the ſalt. So ſenſible are they " of the difference, that if they meet with a ſpot " of mixed ſoil, which often happens, they eat " ſalt in proportion †.

" Towards the latter end of July, the rams are " turned in among the tribe of ewes, regulated at " ſix or ſeven rams for every hundred ewes; and " when the ſhepherd judges that theſe have been " ſerved, he collects the rams into a ſeparate tribe " to feed apart. There is alſo another tribe of " rams which feed apart, and never ſerve the ewes, " but are kept ſolely for their wool and for the " butchery: for though the wool and fleſh of " wethers are finer and more delicate than thoſe

† This ſhows how favourable for ſheep thoſe paſtures are which lie on lime-ſtone, or chalk, as moſt in England do; for in the ſouth of this iſland there is chalk almoſt every where, and lime-ſtone abounds in the north-weſt.

" of rams, yet the fleece of a ram weighs " more than the fleece of a wether, who is likewiſe " ſhorter-lived than the ram: for theſe reaſons " there are but few wethers in the royal flock of " Spain. The fleeces of three rams generally " weigh twenty-five pounds; and there muſt be " the wool of four wethers, and that of five ewes, " to make an equal weight. There is the ſame " diſproportion in their lives, which depend on " their teeth: for when theſe fail, they cannot " bite the graſs, and are of courſe condemned to " the knife. The ewe's teeth begin to fail after " five years of age, the wether's after ſix, and " thoſe of the robuſt ram not till towards eight.

" At the latter end of September they put on " the redding or ocre, which is a ponderous irony " earth, common in Spain: the ſhepherd diſſolves " it in water, and dawbs the backs of the ſheep with " it from the neck to the rump. It is an old cuſ- " tom. Some ſay it mixes with the greaſe of the " wool, and ſo becomes a varniſh impenetrable to " the rain and cold; others, that its weight keeps " the wool down, and thereby hinders it from " growing long and coarſe; and others again, that " it acts as an abſorbent earth, and receives part " of the tranſpiration, which would foul the wool, " and render it harſh.

" Likewiſe in the latter end of September the " ſheep begin their march towards the low plains. " Their itenerary is marked out by immemorial " cuſtom, and by ordinances. Their journies " are often ſo long, that the poor creatures go " ſix or ſeven leagues a day to get into open wilds, " where the ſhepherd walks ſlow, to let them " feed at their eaſe and reſt: but they never ſtop; " they have no day of repoſe; they march at leaſt " two leagues a day, conſtantly following the ſhep- " herd, till they get to their journey's end. From

" the territory called the Montana, at the extre-
" mity of Old Caſtile, from whence they ſet
" out, to Eſtremadura, is an hundred and fifty
" leagues, which they march in leſs than forty
" days. The chief ſhepherd's firſt care is to ſee
" that each tribe is conducted to the ſame diſtrict
" it fed in the year before, and where the ſheep
" were yeaned, which they think prevents a varia-
" tion in the wool; though this requires but little
" care; for it is a known truth, that the ſheep
" would go to that very ſpot of their own accord.
" His next care is to fix the toil‡ (in England hur-
" dles) where the ſheep paſs the night, leſt they
" ſhould ſtray, and fall into the jaws of wolves.

" Next comes the time when the ewes begin to
" drop their lambs, which is the moſt toilſome
" and moſt ſolicitous part of the paſtoral life. The
" ſhepherds firſt cull out the barren from preg-
" nant ewes, which laſt are conducted to the beſt
" ſhelter, and the others to the bleakeſt part of
" the diſtrict. As the lambs fall, they are led
" apart with their dams to another comfortable
" ſpot. A third diviſion is made of the laſt-yeaned
" lambs, for whom was allotted from the begin-
" ning the moſt fertile part, the beſt ſoil, and the
" ſweeteſt graſs of the down, in order that they
" may become as vigorous as the firſt-yeaned; for
" they muſt all march on the ſame day towards
" their ſummer-quarters. The ſhepherds perform
" four operations upon all the lambs about the ſame
" time in the month of March; *viz.* they cut off
" their tails five inches below the rump, for clean-
" lineſs; they mark them on the noſe with a hot
" iron; they ſaw off part of their horns, that the

‡ The toils are made of Sparto, in meſhes a foot wide, and the thickneſs of a finger. Sparto is a ſort of ruſh which bears twiſting into ropes for coaſting veſſels. It is ſo light as to ſwim; whereas hemp ſinks. The Engliſh ſailors call it boſs.

" rams may neither hurt one another nor the " ewes; and they emaſculate the lambs intended for " bell-weathers, to walk at the head of the tribe.

" As ſoon as April comes, the ſheep expreſs, " by various uneaſy motions, a ſtrong deſire to " return to their ſummer habitations. The ſhep- " herds muſt then exert all their vigilance to pre- " vent their eſcaping; for it has often happened " that a tribe has ſtolen a forced march of three " or four leagues upon a drowſy ſhepherd; and " there are many examples of three or four ſtray- " ed ſheep walking a hundred leagues to the very " place they fed on the year before.

" In the ſummer ſheep-walks I learnt that the " three following opinions ſhould be ranked among " vulgar errors:

" 1. That ſalt-ſprings are not found in the high " mountains, but in the low hills and plains only. " The whole territory of Molina is full of ſalt- " ſprings, and there is a copious one riſing out of " land higher than the ſource of the Tagus, and " not far from it; which is one of the higheſt " lands in all the inward parts of Spain.

" 2. The metallic vapours deſtroy vegetation; " and that no rocks nor mountains pregnant with " rich veins of ore are covered with rich vegetable " ſoils. There are many iron, copper, lead, " and pure pyritous ores, in theſe ſheep-walks, " where grow the ſame plants, and the ſame ſweet " graſs, as in the other parts.

" 3. That ſheep eat and love aromatic plants; " and that the fleſh of thoſe that feed on the hills " where ſweet herbs abound, has a fine taſte. I " have obſerved, that when the ſhepherd made a " pauſe, and let the ſheep feed at their will, they " ſought only for fine graſs, and never touched " any aromatic plant, that when the creeping " *ſerpillum* was interwoven with the graſs, they in-

" duſtriouſly noſled it aſide to bite a blaid of graſs;
" and that this trouble ſoon made them ſeek out a
" pure gramineous ſpot. I obſerved too, when
" the ſhepherd perceived a threatening cloud, and
" gave a ſignal to the dogs to collect the tribe and
" then go behind it, walking apace himſelf to lead
" the ſheep to ſhelter, that, as they had no time
" to ſtoop, they would take a ſnap of ſtæchas,
" roſemary, or any other ſhrub in their way: for
" ſheep will eat any thing when they are hungry,
" or when they walk faſt. I ſaw them greedily
" devour henbane, hemlock, glaucium, and other
" nauſeous weeds, upon their iſſue out of the
" ſheering-houſe ‖.

" The ſhepherd's chief care now is, not to ſuffer
" the ſheep to go out of their toils till the morn-
" ing ſun has exhaled the dew of a white froſt,
" and never let them approach a rivulet or pond
" after a ſhower of hail; for if they ſhould eat the
" dewy graſs, or drink hail-water, the whole tribe
" would become melancholy, loſe all appetite,
" pine away and die; of which there have been
" frequent inſtances *.

‖ Mr. Collinſon's correſpondent obſerves very juſtly on this occaſion, that if ſheep loved aromatic plants, it would be one of the greateſt misfortunes that could befall the farmers of Spain: for that the number there is incredibly great, and the bees ſuck all their honey, and gather all their wax, from the aromatick flowers which enamel and perfume two-thirds of the ſheep-walks. He aſſures us, that he himſelf knew a pariſh-prieſt who had five thouſand hives, and whoſe method was cautiouſly to ſeize the queens in a ſmall crape fly-catch, and then clip off their wings. This obliged their majeſties to ſtay at home; and he declared, that he never had loſt a ſwarm from the day of his diſcovery, to the time of his relating this, which was five years.

* Hail-water is likewiſe ſo pernicious to men in the climate here ſpoken of, that the people of Molina will not drink their river-water after a violent ſhower of hail; experience has taught them the danger: but let it be never ſo muddy, and riſe never ſo high after rain, they drink it without fear. Perhaps this may be the unheeded cauſe of many epidemics in other cities.

" The ſheep of Andaluſia, which never travel,
" have coarſe, long, hairy wool. I ſaw ſome in
" Eſtremadura whoſe wool trailed on the ground.
" The itenerant ſheep have ſhort, ſilky, white
" wool; the fineneſs of which is owing to the
" animal's paſſing its life in the open air, of equal
" temperature; for it is not colder in Andaluſia or
" Eſtremadura in the winter, than it is in the
" Montana or Molina in ſummer. Conſtant heat,
" or conſtant cold, with houſing, are the cauſes
" of coarſe, ſpeckled, black wool: and I do be-
" lieve, from a few experiments and long obſer-
" vation, that if the fine-woolled ſheep ſtayed at
" home in the winter, their wool would become
" coarſe in a few generations; and on the other
" hand, that if the coarſe-woolled ſheep travelled
" from climate to climate, and lived in the free
" air, their wool would become fine, ſhort, and
" ſilky likewiſe in a few generations.

" All the animals that I know of, who live in
" the open air, conſtantly keep up to the colour
" of their ſires. There are the moſt beautiful
" brindled ſheep in the world among the coarſe-
" woolled ſheep of Spain. I never ſaw one among
" the fine-woolled flocks: the free, but leſs abun-
" dant perſpiration in the open air, is ſwept away
" as faſt as it flows; whereas it is greatly increaſed
" by the exceſſive heat of a number of ſheep
" houſed all night in a narrow place. It fouls the
" wool, makes it hairy, and changes its colour.
" The ſwine of Spain, who paſs their lives in the
" woods, are all of one colour, as the wild boars.
" They have fine, ſilky, curled briſtles. Never
" did a Spaniſh hog's briſtle pierce a ſhoe. What
" a quantity of dander is daily ſcoured from the
" glands of a ſtabled horſe; the curry-comb and
" hair-cloth ever in hand! How clean is the ſkin
" of a horſe that lives in the open air!

" The ſhepherds begin to ſheer their ſheep on " the firſt of May, provided the weather be fair : " for if the wool were not quite dry, the fleeces, " which are cloſe piled one upon another, would " rot. It is for this reaſon that their ſheering- " houſes are ſurprizingly ſpacious. I ſaw ſome large " enough to contain twenty thouſand ſheep in bad " weather, and which coſt above five thouſand " pounds ſterling. Beſides, the ewes are crea- " tures of ſuch tender conſtitutions, that if they " were expoſed immediately after ſheering, they " would all periſh.

" An hundred and twenty-five ſheermen are " employed to ſheer a flock of ten thouſand ſheep. " One man ſheers twelve ewes a day, and but " eight rams. The reaſon of this difference is, " not only becauſe the rams have larger bodies, " ſtronger, and more wool; but alſo becauſe the " ſheermen dare not tie their feet as they do thoſe of " the unreſiſting ewes. Experience having taught, " that the bold, rebellious ram will ſtruggle, even " to ſuffocation; but when held captive under the " ſheers, they gently lay him down, ſtroke his " belly, and beguile him out of his fleece. A cer- " tain number of ſheep are led into the great " ſhelter-houſe, which is a parallelogram, of four " or five hundred feet long and an hundred wide, " where they remain all night, crouded as cloſe " together as the ſhepherd can keep them, that " they may ſweat plentifully, which, ſay they, ſoftens " the wool for the ſheers, and oils their edges. " They are led by degrees, in the morning, into " the ſpacious ſheering-hall, which joins the " ſweating-room. The ſhepherd carries them off " as faſt as they are ſhorne, to be marked with " tar : and as this operation is neceſſarily per- " formed upon only one at a time, it gives a fair " opportunity to the ſhepherds to cull out for the

" butchery all the ſheep of the flock who have " out-lived their teeth. The ſheered ſheep go to " the fields to feed a little if it be fine weather, " and they return in the evening to paſs the night " in the yard before the houſe, within the ſhelter " of the walls; but if it be cold and cloudy, they " go into the houſe, and are thus brought by de- " grees to bear the open air."

The above, or a ſimilar practice, might be followed to advantage by the counties which border on Wales, or on the Grampian hills in Scotland: for in both thoſe countries there is ſummer-paſture for a much greater number of cattle than they can maintain in the winter. In both, the paſture is not only dry and healthy for ſheep, but they would likewiſe thereby avoid the great ſummer-heats to which they are at times expoſed, even in this moderate climate.

In dry and high grounds, where the herbage is thick and fine, the ſheep are much more healthy, and their fleſh is of a much finer flavour than that of thoſe which are fed in moiſt vallies and low plains; unleſs thoſe vales be ſandy, or very dry, or near the ſea. Theſe laſt are, indeed, the beſt of all, becauſe the herbage there is naturally ſprinkled with ſalt. Alſo the ewes fed on them yield more milk, and of a better taſte.

Sheep ſhould not, if poſſible, be ſuffered to feed on low, moiſt grounds, or ſuch as have been lately drained, unleſs theſe are become very dry; and even then it ſhould be only in the middle of the day. Grounds over which mineral or hard waters run are alſo prejudicial to them; as is likewiſe graſs in which the webs or eggs of graſs-hoppers, or other inſects, are found; or in which the dung of rats or field-mice lies. When ſheep are forced to feed on ſuch paſtures, it is adviſeable to rub their mouths frequently with ſalt, and to have ſalt laid

for them in veſſels, where they will greedily lick it one after another; for they are remarkably fond of ſalt, and nothing is more healthful when given in moderation.

The world is greatly indebted to the celebrated Linnæus for the inquiry which he has excited in regard to ſuch plants as are agreeable or hurtful to each domeſtic animal. He has obſerved, in a diſſertation intitled *Pan Suecus* (*b*), that ſheep eat 387 ſorts of Swediſh herbs and plants; and that they leave 141 of them untouched, as being hurtful, or leſs nouriſhing, and therefore leſs ſuitable to their nature. A ſimilar account of our Engliſh plants might be of great ſervice to our huſbandmen and owners of land, eſpecially to ſuch as are concerned in grazing.

Among other intereſting obſervations, Linnæus remarks (*c*), that the milfoil, or yarrow, is a food which ſheep are particularly fond of; and I have been told by a gentleman who had been at much pains to clear his ground of this plant, that having turned ſome ſheep into a field where there yet remained a good deal of it, he was greatly ſurpriſed at finding the next day that the ſheep had ſcarcely left a plant of it, but had eaten it quite down to the ground. He then lamented his former induſtry, and laid down as an eaſy rule, by which every one may judge what plants are moſt agreeable to the different animals, to obſerve which are thoſe that they prefer on being turned into a freſh paſture, or what are the plants in common paſtures which the creatures feeding there never ſuffer to raiſe to ſeed. Thus the milfoil never runs to ſeed but in places where ſheep cannot get at it. It is the ſame with the chamomile, though ſo bitter a plant, and with the narrow-leaved plantain or

(*b*) *Page* 387. (*c*) *Pan Suecus, page* 95.

ribwort. Theſe plants have another advantage attending them with regard to ſheep, which is, that as they ſtrike deep roots they retain their verdure the longer, and therefore deſerve to be carefully cultivated by thoſe who have flocks of ſheep.

Burnet has, on all occaſions, been found to be peculiarly pleaſing and healthful to ſheep. An inſtance of its being both happened to a gentleman of my acquaintance in the year 1766; the ſummer of which being extremely wet, ſheep in general were much afflicted with the rot. This gentleman, very attentive to rural oeconomy, bought ſome ſheep in the autumn of that year, which he put into a field of burnet, and killed them during the winter, as his family-conſumption required. Every one of them was found to be in a perfectly ſound ſtate; whilſt every ſheep belonging to a neighbouring gentleman, and which had been part of the ſame flock, which was Welſh, was diſeaſed. It was very remarkable too in theſe laſt ſheep, that, though they had plenty of graſs and turnips, they could not be confined; but the moment they were put into the field of burnet belonging to the former gentleman, they became perfectly quiet, and never endeavoured to ſtir from thence, though the gate was left open.

The common opinion that ſheep hurt lucerne in the autumn by biting it too cloſe, is without foundation; for the ſpring-ſhoots have no communication with thoſe that remained in the autumn, but are quite freſh ſhoots iſſuing from the crown of the root. Lucerne is an excellent food for all ſheep in the autumn, and particularly ſo for ewes and lambs in the ſpring.

Clover is a very ſucculent food for ſheep, and theſe creatures are extremely fond of it; but if the ſhepherd is not attentive, it may prove dangerous to them. He ſhould always turn them into the

clover with their backs to the wind, and not leave them too long in it. It is ſaid by ſome, that the wind mixing with the clover, which they ſwallow greedily, ſwells them, and makes them die in a few hours: others believe that it is the venom of the reptiles which this plant attracts, that occaſions theſe pretty frequent accidents: but, in truth, the cauſe of this ſwelling is undoubtedly the ſame as was before aſſigned for the hoving of cattle; and accordingly the remedy directed for it by the Royal Society of Agriculture at Rouen is, as ſoon as this misfortune is perceived to have happened to ſome of the flock, to throw cold water over their bodies, if it be at hand, or to pen them up ſo cloſely as to make them preſs ſtrongly one againſt another. This will reſtore them to their natural ſtate.

Sheep likewiſe readily eat turnips, and thrive upon them, when they have been accuſtomed to them early; but they do not reliſh this food when it has not been offered to them till after they are grown old; however, if they are kept faſting two or three days, moſt of them take to it; and when they have once taſted it, they become fond of it, and feed very kindly upon it. In ſome places people feed their lambs with turnips till the middle of April, though they then begin to run up to ſeed. Some parboil them a little at firſt, till their cattle, and particularly their ſheep, are accuſtomed to them: but a lamb only three weeks old will, after it has once eaten of this food, ſcoop out a raw turnip with great delight. Parſley corrects the inconveniences which may ariſe from the too-great moiſture and coldneſs of the turnips, and therefore ſhould be given them in plenty when they are fed upon this root. The ſheep alſo are fond of it.

Carrots are another excellent food for ſheep, and theſe creatures are remarkably fond of them. One acre of theſe roots, well planted, will fatten

a greater number of ſheep, or bullocks, than three acres of turnips, and their fleſh will be firmer and better taſted. Parſnips are alſo another excellent and profitable food for them.

It is a cuſtom in moſt countries, eſpecially where the verdure of the graſs is not ſo conſtant as in Britain and Ireland, to collect the leaves of trees during the ſummer, or before they turn yellow, for feeding all kinds of cattle, and particularly ſheep; and when theſe are mixed with their hay, they have a good effect. Straw, eſpecially of oats, cut and mixed with their hay, is alſo recommended during the winter. The bark of the branches of the fig-tree, and its buds, are likewiſe mixed with their hay in countries where that tree abounds.

It is undoubtedly moſt healthy for ſheep to range at large; but as that is not in the power of every one, they ſhould at leaſt be kept as airy as poſſible.

We are ſo happy in the mildneſs of our climate in England, and in our ſafety from wolves, that our ſheep lie out of doors all the year. Yet I cannot help thinking that they would be greatly benefited if there were at leaſt ſheds under which they might retreat in ſtormy weather: for though ſheep are well cloathed by nature, yet when the rain is ſo conſtant and heavy as to ſoak through their fleeces, they become quite chilled, and that damp cold in them is frequently the cauſe of many diſorders. It is ſaid, that when they are encloſed in the narrow compaſs of a fold, they cheriſh one another by their mutual warmth: but this cannot give relief to the damp which each of them feels.

In climates leſs fortunately circumſtanced than ours, the ſheep are houſed in winter, and fed chiefly with dry fodder. They are led out every day, unleſs the weather be very bad, though this

is rather to air and walk than to feed them. In winter it ſhould be near ten in the morning before they are led out, and they ſhould be brought back again early in the evening, after having had an opportunity of drinking. In ſpring and autumn they are led to paſture as ſoon as the ſun has diſperſed the hoar-froſt or dew on the graſs, and continued there till ſun-ſet. It is ſufficient that they drink once a day in theſe ſeaſons; and when brought back they ſhould find fodder, though in leſs quantity than in winter. It is only during the ſummer months that they can live entirely on the paſtures, and they ſhould then have water in their power twice a day. They may in this ſeaſon be let out early in the morning; and in very warm weather they ſhould be led to cool or ſhadowy places during the mid-day heat, which is found to be remarkably prejudicial, diſordering their heads, and throwing them into vertigoes. In very hot countries, Columella adviſes, that they be led in the morning ſo that their backs be turned to the ſun, and in the evening ſo that the head may be ſhaded by the body.

Many people doubt whether it be more profitable to fold ſheep, than it is to let them range a field at large both night and day; on the principle that their dung and urine are in either caſe pretty equally ſpread over the ſurface of the ground. Cuſtom has, however, given it in favour of folding; and I believe it will be found, that if equal numbers of ſheep are confined during the ſame time in two fields, that in which they are folded will be the moſt effectually and moſt regularly dunged; and therefore I muſt incline to prefer folding.

In the heat of ſummer, the fold ſhould be large enough to admit of the ſheep lying at a moderate diſtance from each other: for, even in the open

air, a great heat is generated by the ſheep when forced to be cloſe together; and more than an ordinary degree of warmth ſhould be avoided at all times. As the weather becomes colder, the extent of the fold may be diminiſhed; but ſpecial care ſhould be taken never to pitch it in a damp place, particularly in rainy weather, or winter; for nothing is ſo prejudicial to ſheep as their being laid wet. On this account it is that in Sweden, ſince the late regulations there, they have in ſome provinces a kind of covered fold going upon wheels, ſo that it can be moved from one place to another: and I am perſuaded, that if this practice was introduced, eſpecially in rich, low paſtures, a conſiderable advantage would attend it, particularly in preventing the rot and purging which ſheep are liable to in wet weather.

Where the great degree of cold, or any other cauſe, renders it neceſſary to houſe ſheep in the winter, their cotes ſhould be built on a dry ſpot; the ſheep ſhould have ſufficient room in them, and openings ſhould be made in the upper parts to carry off the heated air: they ſhould not, on any account, be made too warm, nor ſhould the dung and litter ever be ſuffered to riſe too high in them. The racks for the ſheep ſhould never be fixed to the wall, but hang from the roof, ſo that they may be raiſed or lowered at pleaſure. They ſhould never hang too high; becauſe when the ſheep are obliged to raiſe their heads too much, little bits of their food are apt to fall among their wool, which they intangle, and alſo in their eyes, where they bring on inflammations, and ſometimes blindneſs. The rack ſhould therefore not be higher than the flanks of the ſheep. The roof of the cote ſhould be covered with laths rather than with ſtraw, or other ſuch material, becauſe the duſt, chaff, or inſects, falling from theſe laſt would damage the

wool. Spiders eſpecially are very hurtful to ſheep. The Swedes are ſo particularly careful in this reſpect, that they even white-waſh the walls of their ſheep-cotes.

When the winters are very ſevere, or the ſheep are in great danger from ravenous animals, it becomes neceſſary to lodge them in houſes, or cotes, during the winter (*b*). Such cotes ſhould be built in dry and airy places, free from ſprings, and from the coming in of water any other way. Whilſt the ſheep are houſed, great care ſhould be taken that the cotes be not kept ſo cloſe as to render the air in them too warm, and that the ſheep have very ſufficient room to lie down. In order to ſecure them from too much heat, the beſt way of admitting a ſupply of freſh air will perhaps be by windows in each end, near the roof; for it is known that the heated and putrid air aſcends, and therefore it will be diſcharged by theſe windows; for there will be a conſtant current of air from the one to the other, as the wind ſhall happen to ſet. The ſheep will, by this means, be kept cool, without having openings through which the wind would blow upon their bodies partially, and thereby occaſion coughs and colds, as every one can teſtify from his own experience.

The proportion of ſpace which Mr. Haſtfer, an ingenious Swede, adviſes (*c*) as a rule in building theſe ſheep-cotes, is to allow ſix feet ſquare for each ſheep*; the height ſhould be proportioned to the extent of the building, and to the number of

(*b*) *Memoires de la Societé Royal d'Agriculture de Rouen, tom. ii.*

(*c*) *Manierè d'élever les Bêteſà Laine, part. ii. c.* 2. §. 2.

* Three Swediſh ells, ſays he, which make very near ſix of our feet; the Swediſh ell being exactly $23\frac{380}{1000}$ inches Engliſh meaſure.

ſheep; but there muſt be at leaſt ten feet between the floor and the roof, ſo that when the depth of dung and ſtraw ſhall amount to four feet, there may ſtill remain an height of ſix feet for the heat to aſcend in: for when the hot exhalations of the ſheep have not ſufficient room to aſcend, they return back, and fall upon the lungs of the ſheep, open their pores, and make them ſweat more than ever. Conſequently great care ſhould always be taken to make theſe buildings high enough, and large enough to prevent ſuch immoderate heat†.

A cote twenty feet long ſhould be ten feet high; that is the proportion for ſmall cotes: but to twenty feet more in length there muſt always be added two feet more in height; that is to ſay, that for forty feet of length there muſt be twelve feet of height, and ſo in proportion for larger ſizes. The breadth is generally half of the length: that is the beſt ſymmetrical proportion, and gives the greateſt ſtrength to the roof: though Mr. Hatsfer would have them rather exceed the above dimenſions in point of height, becauſe that contributes greatly to keep the air purer than it would otherwiſe be, and nearer to the temperature of a cool ſummer's day, or a fine clear day in autumn, which is the degree of warmth moſt to be deſired, and that for the following reaſons in particular:

"1. In the ſpring, when the cold is greater abroad than in the cote, it is wrong to keep the cote too warm, becauſe the ſudden change from heat to cold is too ſenſibly felt by the ſheep, has an influence on their blood, and neceſſarily affects their ſtrength and health.

† A cote twenty feet ſquare is large enough for thirty ſheep; and a cote ſixty feet long and thirty feet wide is ſufficient for an hundred and fifty ſheep, including rams and lambs. Any one may of courſe form his calculation from hence. HATSFER. *Manière d'éleverles Bêtes á Laine. Part ii.*

" 2. In winter, the ſheep, by paſſing ſuddenly from hot to cold, and from cold to hot, cannot but get coughs.

" 3. It is plain, that if too great perſpiration is hurtful to ſheep in ſummer, when freſh graſs gives them the moſt ſtrength, it muſt be much more ſo in winter, when they eat only dry hay, or even ſtraw, which affords them leſs ſtrength, and leſs nouriſhment; eſpecially as the heat, which ought to prevent, or at leaſt moderate, the bad effects of the ſuperfluous humours, is at the ſame time evaporated and waſted.

" 4. The heat which penetrates through the pores into the groſs winter's wool, makes it grow too much: now this wool is not only of leſs value than the other good wool which the ſheep are to keep till ſhearing-time; but it falls off of its own accord as ſoon as the ſheep paſs from the cote into the cold ſpring air; and then this loſs of their wool cauſes illneſſes in them, and even death.

" The floor of the ſheep-cote ſhould be paved either with ſtones, or with bricks or clinkers, and raiſed a little archwiſe in the middle, in order that the urine of the ſheep may run off eaſily on all ſides through ſmall holes made for that purpoſe at the bottom of the building. Some cover this floor with earth, and others with ſand, to the depth of five or ſix inches, in order that the urine of the ſheep may ſoak into it, and thereby render it fit for manuring of land. The floor itſelf may indeed be made of ſand, as is the practice of ſome; and in that caſe, inſtead of raiſing it in the middle, it ſhould be ſomewhat lower there, in order that the urine may penetrate thoroughly into the ſand; and when it is ſufficiently impregnated, it is covered with new ſand, or thrown out of the cote with the dung of the ſheep, and laid up in a heap for manure.

" It is likewiſe to be obſerved, that of whatever height the cote may be, the dung in it ſhould never be ſuffered to increaſe to more than four feet deep: for which reaſon the ſides of the cote ſhould be lined with wood to that height in the inſide. The cote ſhould be more or leſs high in proportion to the number of ſheep kept in it; for by this means the heat will be more or leſs great, as it will riſe to a greater or leſs height.

" In whatever manner the floor of the cote is made, it ſhould always be covered with freſh ſtraw before the ſheep are put into it; as well for their pleaſure as for their health. By this means too their wool is preſerved from filth; and when the floor is made of wood, as is alſo the way of ſome, the ſtraw preſerves the ſheep from having their ſkin or their fleſh hurt by ſplinters, or their wool by turpentine in the boards. This ſtraw muſt be removed from time to time, and in ſome caſes pretty often. Care muſt likewiſe be taken that there be neither ſplinters nor turpentine in the ſide-linings towards the bottom; for which reaſon the wood uſed there, and indeed as high as the ſheep could reach from the top of the greateſt quantity of dung that ought to be in the cote, ſhould not be touched with either axe or plane, but left in its natural round form, with only the rough bark thoroughly peeled off it, and the wood then left for ſome time to dry in the ſun, in order that all its reſinous parts may be exhaled. Such is the method of the Swedes when they build cotes of this kind.

" Beſides the above-mentioned windows at each end of the cote, intended chiefly to purify the air in it, there ſhould likewiſe be other common windows at convenient diſtances in the ſides of this building; becauſe, as was before obſerved, ſheep are fond of much light, and never thrive well in dark places.

" Their fodder ſhould ſtand in ricks near the cotes, and be kept as free as poſſible from duſt and all other impurities.

" The ſheep in the cote ſhould be foddered in cribs made for that purpoſe, as well for the ſake of ſaving, as to prevent the falling of any thing upon their wool; and for this reaſon theſe cribs ſhould be placed in the middle of the cote; for if any hay chances to fall upon the ſheep, they pull off each others wool in trying to eat it.

" The cote thus built, however ſmall it be, muſt be divided into two parts at leaſt, in order to ſeparate the ſick ſheep, or ſuch as are ready to lamb, from thoſe which are not in either of theſe caſes: but they who would have a perfectly complete building to houſe their ſheep in, ſhould divide it into ſeveral compartments, in proportion to the number and kinds of their ſheep, and according to the other circumſtances attending them. Theſe compartments may be made of whatever ſize is thought moſt proper, provided the ſheep have but room enough in them. Or, which would ſeem to be an improvement on Mr. Haſtfer's plan, the cote ſhould rather be built ſeparate, becauſe then, beſides the more effectual parting of them in caſe of need, each kind of ſheep will naturally go to the home where they are fed.

" Beſides the above-mentioned compartments, it is neceſſary to have a moveable crib, about four feet high, going upon four wheels of ſeven or eight inches diameter each, to be drawn from one place to another. The uſe of it is to bring the ſheep cloſe up together in a ſmall compaſs, when one would either make them ſweat, or count them over. By this means their rubbing one againſt another, by which they loſe a great deal of wool, is avoided.

" It is likewiſe neceſſary to have a ſmall build-

ing ſeparate from the common cote or cotes, to keep apart ſuch ſheep as are attacked with contagious diſeaſes, in order that their breath may not infect the others.

" As to the colour of the ſheep-cote, ſome would have it to be white, or of the colour of the wood it is built of, in order that the ſheep big with young may not ſee in it any thing to ſurpriſe them.

" The beſt covering, or roof, is that which is made of ſtraw or holly. The roofs made of boards are apt to warp, and let in the air through their crevices.

" Great care muſt be taken to preſerve the cote free from ſpiders and their webs.

" The outſide ſhould be ſmooth, and free from every kind of glutinous ſubſtance, at leaſt as high as the ſheep can reach, leſt they ſhould rub themſelves againſt it, and thereby tear off their wool.

" There ſhould be gutters all along the lower part of the roof to receive and carry off rain.

" As ſoon as the cote is finiſhed, it ſhould be fumigated in the inſide, by burning in it hoofs or horns of cattle raſped, the hair of cattle, woollen rags, brimſtone, and boughs of juniper with their fruit on."

Mr. Haſtfer's above directions appear to be chiefly calculated for a woody country: but where ſtones are plentiful, the walls will be beſt built with them, and tiles and ſlates will make proper covering for the cotes.

A certain fixed time of the year cannot be obſerved in all countries for ſhearing of ſheep, becauſe the ſummer does not advance equally in each of them. The beſt way therefore is to be directed by the weather, ſo that the ſheep may neither ſuffer by the cold when ſtripped of their wool, nor be injured through too great heat by being made to

wear it too long. After they are ſhorne, they ſhould be anointed with ſomething that will deſtroy any remaining vermin. Columella (*d*) recommends for this purpoſe a ſtrong decoction of lupins, lees of wine, and the dregs of oil, of each equal quantities, mixed together. Some uſe a decoction of tobacco in ſalt water. After the ſkin has been ſoaked with one or other of theſe liquors for three days, the ſheep ſhould be waſhed in the ſea, if near; otherwiſe in water in which ſalt has been boiled.

The wethers have generally more wool than the ewes, and it is alſo better. That of the neck and the top of the back is prime; that of the thighs, tail, belly, throat, and head, is not ſo good; and the worſt is that which is taken from dead beaſts, or ſuch as are ſick. White wool is alſo preferred to the grey, brown, and black, becauſe it will take any dye. Strait wool is better than curled; and it is even ſaid that the ſheep whoſe wool is too much curled are not in ſo good a ſtate of health as thoſe whoſe wool is ſtraiter.

The general colour of ſheep is a dirty white, or pale yellow: there are alſo many of a blackiſh brown, and not a few ſpotted with a yellowiſh white and black.

The flock ſhould be examined every year, in order to pick out ſuch as begin to grow old, and are intended for fattening; for as theſe require a different management from the others, they ſhould then be formed into a ſeparate flock. They ſhould be led abroad in ſummer before the riſing of the ſun, that they may feed on the graſs whilſt it is yet moiſtened with dew; for nothing forwards the fattening of wethers more than a great quantity of moiſture: and as, on the other hand, nothing obſtructs it more than too much heat, they ſhould be

(*d*) *Lib. VII. c. iv.*

brought home, or at leaſt driven to a ſhady place, at about eight or nine in the morning, before the ſun begins to be too powerful, and ſalt ſhould then be given them to excite thirſt. About four in the afternoon, they ſhould be led a ſecond time into cool and moiſt places, and be again made to drink as much water as they can before they are either houſed or folded at night. Two or three months of this management will give them all the appearance of being full of fleſh: indeed they will be fattened as much as they can be: but as this fat proceeds only from the great quanity of water which they drink, it may properly be looked upon as no better than an œdema, or bloated humour, which would in a ſhort time turn to the rot; the only means of preventing which is to kill them whilſt in this ſtate of fatneſs: though even then their fleſh, far from being firm and juicy, is extremely inſipid and flabby. To render their fleſh perfectly fine and good, they ſhould, beſides feeding on the dew and drinking a great quantity of water, have at the ſame time more ſolid food than graſs To this end the ſhepherd ſhould alſo, in the ſeaſon, turn them, into the fields, to glean, as ſoon as the corn has been taken off. They may be fattened in any ſeaſon, even the winter not excepted, by only keeping them apart in a ſheep-cote, and feeding them with good hay, meal, or barley, oats, wheat, beans, &c. mixed with ſalt, to make them drink the more copiouſly. But in whatever manner, and in whatever ſeaſon they are fattened, they muſt be diſpoſed of immediately; for they cannot be fattened twice, and if they are not killed by the butcher, they will die by diſeaſes of the liver. Three months are at all times ſufficient to fatten them; but leſs will do near the ſea.

Ewes fatten very faſt near their pregnancy, becauſe they then eat more than at other times: but

their fleſh, and eſpecially that of an old ewe, is flabby and inſipid. That of the ram, though he has been knit before fattening, is always rank and ill-flavoured. The fleſh of the wether is by far the moſt ſucculent, and the beſt of all common meats.

The proper time for caſtration is when the lambs are five or ſix months old, and the weather mild. The beſt way of performing this operation is by inciſion. The teſticles, which are eaſily ſeparated from the bag, are then drawn out at the wound, and cut off. The lamb will probably be ſick and dull for a little while after the caſtration, and therefor it will not be improper to give him for two or three days a ſmall quantity of ſalt, to prevent a loſs of appetite, which this operation often occaſions.

The antients tell us that all ruminating animals have ſuet; but this is ſtrictly true only of the goat and ſheep, and that of the ſheep is in greater quantity, whiter, drier, firmer, and of a better quality than the other. Fat differs from ſuet, in that it continues always ſoft; whereas ſuet hardens as it grows cold. It is chiefly about the kidneys that the ſuet is found; and, as was before obſerved of the horned cattle, the left has always more of it than the right. There is alſo a great deal of it in the cawl, and about the inteſtines; but this ſuet is far leſs firm and good than that of the kidneys, the tail, and other parts of the body. Wethers have no other fat than ſuet; and ſo predominant is this fat in their conſtitution, that all the extremities of their fleſh are covered with it. Their very blood is not without it; and the ſeminal lymph is ſo ſaturated with it, as to appear of a different conſiſtence from that of other animals.

CHAP. III.

Of the Propagation of Sheep.

THE ram is capable of generating at eighteen months, and a ewe may yean at the end of a year: but it is better to ſtay till the ewe be two, and the ram three years old; for the produce of theſe, if too early, or even the firſt at any time, is always weak, and of a bad conſtitution. One good ram will ſuffice for twenty-five or thirty ewes.

The qualities required in a good ram are, that he be ſtrong and comely: his head muſt be large and thick; his forehead broad, round, and well riſing; his eyes large and black; his noſe ſhort; his neck thick, and arched like that of a fine horſe; his body long and raiſed; his ſhoulders, back, and rump broad; his teſticles large, and his tail long; his legs ſmall, ſhort, and nimble: he muſt alſo have horns; for thoſe which have not any, as is the caſe of ſome, are very indifferent creatures for breeding, at leaſt in climates like our's. The beſt rams are white, with a large quantity of wool on the belly, tail, head, and ears, quite down to the eyes; and particular care ſhould be taken that neither the mouth nor tongue be either black or ſpeckled, becauſe the wool of the lambs would moſt probably partake of this defect.

The beſt ewes for propagation are thoſe which have moſt wool, and that cloſe, long, ſilky, and white; eſpecially if they have alſo a large body, a thick neck, and an eaſy, light gait.

The natural ſeaſon of the ewe's heat is from the beginning of November to the end of April; but

they may be brought to conceive in any ſeaſon, by giving them provocative foods, ſuch as bread made of hemp ſeed, or oatmeal, oil-cakes, &c. and water in which ſalt has been diluted. Each ewe ſhould be covered three or four times, and then ſeparated from the ram, which always prefers the older ſheep, and neglects the younger. In the ſeaſon of copulation, they ſhould not be expoſed to rain or bad weather; wet hindering their retention, and a clap of thunder often producing abortion. In a day or two after they have been covered, they ſhould be returned to their common diet, and not have any more ſalt-water; becauſe the continual uſe of this, as well as that of hemp-ſeed bread, or other hot aliments, would infallibly cauſe abortion: but they may always be given to the ram for ſome time before he is put to the ewe. Ewes go five months, and yean at the beginning of the ſixth. They ſeldom bring more than one lamb at a time. In hot climates they yean twice a-year, but in colder countries only once. Thoſe which are rather lean than fat, bring forth moſt eaſily.

Some put the ram to their ewes about the end of July, or the beginning of Auguſt, in order to have lambs at Chriſtmas, or early in January: but then they run a hazard of the lambs being deſtroyed by the cold, for they are extremely tender creatures. However, the ram is given to the much greater number in the months of September, October, and November; and lambs are accordingly to be had in plenty in February, March and April. They are alſo to be had in May, June, July, Auguſt, and September; there being no ſcarcity of them but in October, November, and December.

When a ewe is near yeaning, ſhe muſt be ſeparated from the flock, and carefully watched, in order to her being aſſiſted, if needful; for the lamb often preſents itſelf croſs-wiſe, or with its feet fore-

moſt, and in either of theſe caſes the ewe's life would be in danger if ſhe were not helped. As ſoon as the lamb is yeaned, it muſt be raiſed on its feet, and at the ſame time all the milk in the ewe's udder ſhould be drawn out, becauſe it is vitiated, and would be very noxious to the lamb, which muſt therefore be kept from ſucking till the udder is repleniſhed with freſh milk. The lamb muſt be kept warm, and ſhould be ſhut up with its dam for three or four days, that it may learn to know her. During this time, the ewe ſhould be fed with good hay, barley-meal, or bran mixed with a little ſalt: and her drink ſhould be water, the chill of which has been taken off, mixed with a little flour, bean-meal, or ground millet. At the end of four or five days ſhe may be gradually brought back to the ſame kind of food as the other ſheep, and be returned to the flock; only taking care that ſhe be not driven too faſt, nor too far, leſt her milk ſhould be heated: and ſome time after, when the ſucking lamb ſhall have gathered ſtrength, and begins to play, it may be left to follow its dam to the paſtures; no farther care being then neceſſary; for it will find its dam amidſt a very numerous flock, and ſeize her dug, without ever being miſtaken.

Lambs yeaned between the beginning of October and end of February muſt be kept in the houſe, on account of the cold, and be ſuffered to go out only in the morning and evening to ſuck; but about the middle of April they may be turned into the open fields. Some time before this is done, a little graſs ſhould be given them daily, in order to accuſtom them by degrees to this new food. They may be weaned at the end of one month; but it is better to let them continue to ſuck for ſix weeks or two months.

The largeſt, moſt vigorous, and thickeſt-fleeced lambs, eſpecially if their wool be all white and with-

out ſpots, are the beſt for keeping. Thoſe of a weakly appearance are generally diſpoſed of to the butcher. Lambs of the firſt yeaning, as before obſerved, are never ſo good as thoſe of the following: and it is a general rule with all good huſbandmen, rather to bring up the young of their cattle of every kind, than to ſell them off when young; the profits in the former caſe being by much the moſt conſiderable.

The ewe yields, during ſeven or eight months, plenty of milk, which is good food for children and peaſants. It alſo makes good cheeſe, eſpecially if mixed with that of cows. Ewes may be milked twice a day in ſummer, but only once in winter, viz. immediately on their going to paſture, or at their return.

Ewes eat more during their pregnancy than at other times, and accordingly they then fatten very faſt: but they are alſo then very apt to hurt themſelves, ſo as, frequently, to miſcarry, and ſometimes to become barren from that time: nor is it very extraordinary for them to bring forth monſtrous productions. If no accident befalls them, and they are properly tended, they are capable of yeaning during their whole life; that is, to the age of ten or twelve years: but generally they break and become ſickly when they are turned of ſeven or eight. A ram lives to twelve or fourteen years; but is no longer fit for propagation after eight: he ſhould therefore then be knit, and fattened with the old ſheep; though even then his fleſh will be rank and ill-taſted: that of an old ewe is at beſt flabby and inſipid: the fleſh of the wether is moſt ſucculent, and the wholeſomeſt of all common meats.

CHAP. IV.

Of the Diſeaſes of Sheep.

A Shepherd well verſed in feeding his flock properly during the different ſeaſons of the year, and ſkilled in the methods of curing the ſeveral diſorders to which ſheep are ſubject, is a very valuable perſon, and therefore ſhould be ſought for with the utmoſt diligence; for on his care and abilities the welfare of the flock greatly depends. How injudiciouſly then do they act, who reſign the care of their ſheep to boys, or to the leaſt deſerving of their ſervants!

Mr. F. W. Haſtfer, the Swediſh gentleman before quoted, and to whom the world in general, and his own country in particular, is much indebted for a well-methodized ſet of *Inſtructions concerning the manner of rearing and improving ſheep*, reduces the general cauſes of their diſeaſes to the five following heads, *viz.* 1. Too great heat; 2. Severe cold; 3. Water; 4. Fright; and 5. Unhealthy paſtures. If due care is taken to prevent the inconveniences which ariſe from theſe cauſes, there will not be much room to fear a general ſickneſs or mortality amongſt them.

It is generally thought that the brain of a ſheep is more affected by heat than that of any other creature: hence the inconveniences which ariſe to them from the burning heat of the ſummer; and as their wool forms a warm covering around them, the leaſt additional heat greatly increaſes that which they have naturally. Even in the winter, ſheep, particularly in foreign countries, often ſuffer from

too-great heat of their cotes, which their ſhepherds ſhut up very cloſe, and can ſcarcely be perſuaded that they are doing them an injury. In this very wrong practice, which prevails in the northern parts of Europe, and in France, the heat becomes prejudicial on a double account; firſt, from the heat itſelf, which, in crowded cotes, ſometimes riſes to the dog-day heat; but chiefly by the perſpiration of the ſheep, which not only makes the air leſs fit for breathing, but by degrees renders it ſo putrid as to give riſe to fevers of the worſt kind.

Though ſheep can bear cold much better than heat, yet they ſhould not on any account be expoſed to a too ſevere degree of it; and above all, particular care ſhould be taken that the pregnant ewes do not drop their lambs in the open air when the weather is very froſty, becauſe that might cripple the lamb for life.

Too rainy a ſeaſon is very prejudicial to ſheep, as was remarkably experienced all over England in the ſummer of 1766, when whole flocks periſhed with the rot. They who had luckily ſown burnet before were then made thoroughly ſenſible of its good effect, not only in preventing this fatal diſeaſe, but alſo in curing ſheep that were then in almoſt a dying condition. Parſley would have the ſame effect, as it is probable that both of theſe plants carry off the too great humidity by urine. Where neither of them can be had, the ſheep ſhould be houſed during heavy and conſtant falls of rain, be fed with dry hay, and, as much as poſſible, ſheltered from the wet.

Mr. Haſtfer, (*a*) recommends the following powders, as efficacious preſervatives in ſuch ſeaſons. He calls the firſt of them *ant powders*, and the two

(*a*) *Part II. p.* 139, 141.

others *drying-powders*. The ant-powder is made thus:

"In autumn, when the ants have done working, take the whole of an ant-hill, ants and all, ſcooping it out quite to the bottom, in order to have the more of the maſtic or reſinous ſubſtance which they provide for winter. Dry it well in an oven, till the ants and the earth can eaſily be crumbled into duſt betwixt one's fingers; then pound and ſift it very fine, and keep it in a veſſel that has been uſed for ſalted meat or pickled herrings; firſt drying the veſſel well before the powder is put into it. Give to each ſheep a quarter of a pint of this powder mixed with twice as much oats, in their cribs, or otherwiſe, after having ſprinkled it with pounded ſalt, very ſalt water, or human urine. It will make the ſheep ſweat, and experience will prove its good effect."

Mr. Haſtfer adds, that this ant-powder is much uſed in Germany, as the writings of Colerus, Bayer, and others teſtify, that he has ſeen it given in ſome places in Sweden, though not many; and that he himſelf has uſed it on ſeveral different occaſions, and found that nature frequently affords in ſimple remedies as much real utility as in the moſt coſtly. In the year 1746, which was a very wet year in Sweden, he gave this powder, by way of trial, to four ſheep, once a week, and when they were killed the next autumn, their gall and liver were perfectly ſound, whilſt other ſheep, which had not taken it, were full of gall, and their livers covered with hydatides, or watery tumours, in great numbers and of all ſizes.

Of his *drying-powders*, as he terms them, one is compoſed of two ounces of crude antimony, four ounces of bay-berries, four ounces of ſulphur, two ounces of nitre, pounded together, and mixed with ten pounds of ſalt. This is then to be put into the

cribs for the ſheep to lick of it, and into their drink, eſpecially in autumn after they are houſed, and after a rainy ſummer, when there is room to fear they may have ſuffered by the wet.

The other of theſe powders is made thus: Take a pound of crude antimony, half a pound of nitre, and a quarter of a pound of red tartar; pound them well ſeparately, and mix them together. A good ſpoonful is enough for ſix or eight ſheep. Mix it with a little meal and dry wormwood, make it into a paſte, and give the bigneſs of a walnut of it once or twice a week to each ſheep, in autumn and ſpring, when a general mortality prevails. This caſe excepted, it is uſed only as a preſervative once in three weeks or a month; and then not till after the ewes have lambed, and the lambs are ſomewhat biggiſh. The ſheep muſt not be ſuffered to drink the ſame day that they have taken this remedy; but on the contrary, they ſhould be driven about a little, backwards and forwards. This powder purges them by urine and ſweat, drives out their too-abundant humours, and is a very ſalutary medicine.

The ſame ingenious writer gives us alſo, from Van Aken's *Pharmacopœia* for ſheep, the following recipe for making the *Pomeranian powder*, famed for its efficacy in curing many diſorders in ſheep.

"Take a pound of the grey powder of compound ſalt-petre; of gentian and bay-berries, each four ounces; juniper-berries, common ſalt, roots of angelica, elder, pimpernelle, ariſtotolochia, monks-hood, cyclamen, black hellebore, root of fern, betony, millepertuis, carduus benedictus, rhue, millefoil, fumetory, and hyſop, an ounce and a quarter of each, with two ounces of tops of worm-word, two drams and an half of aſſa-fœtida, ſix balls of caſtor prepared. Pound all this into a groſs coarſe powder, and give to each ſheep half an

ounce of it two or three times a week in the morning, mixing it with paſte, or making it up into pellets. They are very fond of it. When contagious diſtempers prevail amongſt ſheep, and there runs from their mouths a thick and glutinous ſlaver, it is a good ſign; but people who have large flocks, as the ſhepherds of Pomerania, who have ſometimes five or ſix thouſand ſheep to take care of, may give this powder to a dozen or more ſheep at a time in their water, a little thickened with flour; taking care that each ſheep has, as nearly as poſſible, its portion of half an ounce of it. When this powder is given them, they muſt not have drank water for two days before.

After they have taken this remedy, they ſhould be driven about a little, and not ſuffered to drink till the next day, when juniper and wormwood ſhould be put into the water that is given them. If they are dropſical, they ſhould not be let drink oftener than every third day. There are extraordinary proofs of the excellent effect of this powder in caſes where other celebrated remedies have not done any ſervice; and experience will convince thoſe who uſe it properly; for it not only expels the noxious humours, and dries gently the ſcab and ſmall-pox, but likewiſe eaſes the breaſt, ſo that the ſheep that it has been given to twice a week have recovered their health, and in a fortnight after, the dropſy being come on, and their heads ſwelled again as big as ever, they have been perfectly reſtored by the uſe of this powder given two days together. Care muſt therefore be taken to uſe this powder in time, in caſe of a relapſe.

A little ſalt ſhould be ſprinkled over almoſt all the medicines that are given to ſheep: it will make them reliſh what might otherwiſe be loathſome; and ſo far as can conveniently be, they ſhould be

phyſicked when the weather is fine: however, this muſt neceſſarily admit of many exceptions.

Peſtilential diſeaſes will be ſo fully treated of in the latter part of this volume, that I ſhall only mention here Mr. Haſtfer's having experienced the efficacy of the above *powder of antimony*, in preſerving ſheep from peſtilential infections, even when thoſe which had taken it chanced to be mixed with ſheep that were infected. He likewiſe recommends the uſe of rhue in their food, and ſuſpended round the neck, when there is a fear of ſuch diſorders: and alſo to prevent their being bitten by ſnakes, theſe reptiles having an averſion to that plant.

SECT. I.

Of Cutaneous Diſeaſes in Sheep.

THE *Scab*, or *Itch*, in ſheep, is contageous, and therefore carefully to be guarded againſt. It ariſes from various cauſes, ſuch as unkindly ſeaſons, the ſkin's being wounded in ſhearing, or torn by thorns, brambles, &c. Lice alſo, by breaking the ſkin in queſt of food, or perhaps for neſts to lay their young ones in, bring on the itch, as does alſo the ſheep's being reduced by hunger.

As ſoon therefore as the ſheep are obſerved to ſcratch or rub themſelves againſt any thing, or to bite their ſkin, the ſhepherd ſhould examine their ſkin with great attention, to ſee whether they have not the itch. If they have it, the wool muſt be cut off wherever that diſorder is perceived, in order that the part may be the more conveniently rubbed with ointment, in which there is brimſtone; for

that ſeems to be the certain antidote, though many forms are boaſted of, in almoſt all of which ſulphur is an ingredient. Quick-ſilver is ſometimes added, on a ſuppoſition of its being more efficacious to deſtroy the lice. The ſmall lice, commonly called ticks, which are little hairy worms ſhaped like buggs, and which pierce the ſkin, are eaſily deſtroyed by a ſtrong decoction of tobacco-ſtalks poured all along the back of the ſheep, ſo as to run down on both ſides: ſome add brandy, to render it the more penetrating. Others again put half a pound of tobacco and a handful of ſalt into five or ſix quarts of water, boil it well, and after the ſheep is ſhorn rub it in with a bruſh, not over hard. At the ſame time they may likewiſe take the antimony-powder as an alterative, or the æthiops-mineral, if the diſorder is come to a great height.

The writers of the *Maiſon Ruſtique* recommend ſtrongly the following, as an excellent general remedy for all ſores of animals, ſheep, goats, dogs, cows, horſes, &c. "Take an ounce of liver of antimony, wrap it up in linen, then put it to ſteep in a quart of wine, (white wine is beſt) and mix therewith eight drams of ſenna; you may, if you pleaſe, add ſugar, nutmeg, and other warm ſpices; for almoſt all the diſeaſes of grazing animals proceed from cold and damp. The remedy is not the leſs good for not having any ſpice. It has been tried every way. Let the drugs ſteep twenty-four hours, or boil them with the wine for ſix or eight minutes, and give a gill of it to each ſheep, the ſame doſe to other ſmall animals, and to large ones, ſuch as cows and horſes, a quart. The creature muſt be kept in a warm place all the day, be well covered, and not have any thing to eat till the evening. It will purge both upwards and downwards. The ſcab and itch will, by this means, be driven out, and the cure will be compleated by bathing the

ſores with the wine in which the liver of antimony has been ſteeped, after ſetting fire to it. No itch will reſiſt this remedy."

Whatever compoſition is made uſe of, it ſhould be rubbed upon the parts affected for at leaſt three or four ſucceſſive nights; and when the ſcabs begin to heal and peel off, the ſheep ſhould be waſhed in a river, if in ſummer, or in a tub of water made a little warm in winter, and be kept within doors till the wool is quite dry. Special care muſt be taken that the ſheep be perfectly cured before they join the flock.

Another cutaneous diſorder (*a*), to which ſheep are liable, ſometimes attacks the face in particular, in ſuch manner that the ſkin and fleſh fall off, the eyes drop out, the ears and horns fall off, and the ſkull is left bare. Sometimes too it ſpreads itſelf over half the body before the ſheep dies. This is thought to be incurable, but not contagious. The following application has been attended with the greateſt ſucceſs. Take oil of tobacco and ſulphur, with quenched mercury, mix, and rub the ſore with them, and waſh it once a day with a very ſtrong decoction of rhue boiled in water. A peaſant, who had a ſheep ſo ill of this diſorder, that its head was eaten all round, freed it from the diſtemper in five weeks, by treating it as above. Mr. Haſtfer (*b*), who relates this caſe, adds, indeed, the creatures eyes fell out of its head, and that its wool became ſo intangled and confuſed as to be all over full of knots.

(*a*) *Haſtfer, part II. p.* 179, calls it an *Eriſipelas*, or *St. Anthony's fire.*

(*b*) *Part II. p.* 180.

SECT. II.

Of Diſeaſes of the Head and Throat.

WHEN ſheep are expoſed to a great heat of the ſun, they are frequently ſeen to become giddy, and turn round. Too much heat of any kind, feeding too long on a dry paſture without drink, or other ſuch cauſes, may have the ſame effect. This is remedied by bleeding, either in the jugular, or in the vein under the eye, or by cuting off the tip of the ear, and by keeping them in a cool place, with plenty of cooling drink, till the ſymptoms quite diſappear. But if the complaint ariſes from water contained in the head, as is ſometimes the caſe, it is incurable; and therefore, when it does not readily yield to eaſy remedies, the beſt way is to kill the ſheep before the diſorder has reduced it.

Sheep are alſo frequently ſeized with an apoplexy, in which they fall dead at once. If ſigns of life remain after they are fallen down, ſuch things as will hereafter be pointed out as antidotes againſt poiſon may be given, and blood be drawn from every place that will afford any. Some are very fond of cutting off the end of the tail, and leaving it to bleed as long as it will.

Sheep are liable to tumours in the throat, which ſhould, if poſſible, be brought to ſuppurate, leſt the matter be tranſlated to ſome other part. When ſuppurated, the ſwelling ſhould be opened, and a free diſcharge given to the matter: but ſome caution ſhould be uſed at firſt in the opening, to avoid a worm that is ſometimes found in ſuch tumours, which being of a poiſonous nature, would, if cut,

envenom the ſore, and endanger the life of the animal. After the worm has been extracted, the abſceſs is to be cured as directed for horſes.

SECT. III.

Of Coughs and Shortneſs of Breath.

THE diſeaſes of the breaſt, ſuch as cough and difficulty of breathing, are to be treated nearly in the ſame manner as in ſimilar caſes for horſes. In caſe of a fever, which is known by the frequency of breathing, heat, dry mouth and tongue, diſreliſh of food, &c. blood ſhould be taken from the neck, and repeated occaſionally. Frequent bleeding becomes therefore neceſſary in ſheep, becauſe it is ſeldom that much blood can be got at a time. In other reſpects, their treatment ſhould be the ſame as is practiſed for horſes; and the diſcharge from the noſe ſhould be encouraged, as is allowed for horſes.

When a cough ariſes to ſuch a degree as to occaſion a diſcharge from the noſe, it is adviſeable to ſeparate the ſick from the ſound, becauſe there is reaſon to fear that, in this ſtate, the cough may be contagious. Mr. Haſtfer ſays (*a*), that knotgraſs is ſo very prejudicial to ſheep, as to occaſion violent coughs, in which they dart forth a thin, ſtinking matter.

(*a*) *Part I. p.* 105.

SECT. IV.

Of Diſeaſes of the Body.

DISEASES of the belly may alſo be cured in the manner as is practiſed for horſes, only altering the quantities of the doſes in proportion to the ſtrength of the ſheep. Their having the cholic, or any other diſorder in their bowels, may be diſcovered by their directing their head to the belly, and being otherwiſe diſordered.

SECT. V.

Of Diſeaſes of the Liver.

THE livers of ſheep are ſubject to ſeveral diſorders. In the rot, the liver is conſtantly diſtempered: hydatides, or ſmall watery tumours, are often found in it, and frequently worms; concerning which laſt M. de Buffon (*a*) gives us the following curious extract of a letter written by a doctor of phyſic at Montiers, in the duchy of Tarantaiſe in Savoy, communicated to him by M. Rouillé, ſecretary of ſtate in France for foreign affairs. "It "has for a long time been obſerved, that the "ſheep of our Alps, which are the beſt in all "Europe, ſometimes fall away ſurpriſingly. Their "eyes become white, ſunk, and bleared; their "blood ſerous, with ſcarce any redneſs to be ſeen

(*a*) *Hiſtoire Naturelle de la Brébis.*

" in it; their tongue dry and ſhrivelled; their noſe " ſtuffed with a yellow viſcid and putrid mucus; " an extreme debility, though they eat a great " deal; and, in fine, the whole animal ſyſtem vi- " ſibly decaying. After ſeveral cloſe inquiries, " theſe animals were found to have in their liver " white *papillons* (moths), with proper wings, their " heads of a ſemi-oval form, and of the bright- " neſs of thoſe belonging to the ſilk-worm. I " have been convinced of the reality of this fact, by " ſqueezing about ſeventy, out of the two lobes; " and, at the ſame time, all the convex part " of the liver became lacerated. They have been " found in the veins only, without a ſingle inſtance " of their being in the arteries. In the cyſtic duct, " ſmall ones have been found, together with mag- " gots. The vena porta, and the capſula of Dou- " glaſs, which are viſible there as in man, yielded " to the ſofteſt touch. The lungs and other viſ- " cera were found."—Here M. de Buffon very juſtly remarks, that it were to be wiſhed the doctor had given us a more circumſtantial deſ- ſcription of theſe *papillons*, as he calls them, leſt it ſhould be doubted that the animals which he ſaw were in truth no other than the common worms found in the liver of a ſheep, which are in- deed very flat and broad, and of ſo ſingular a figure, that they might rather be taken for leaves than worms.

The chief reliance for a cure of this diſeaſe ſhould, I think, be in antimony and mercurials; perhaps of choice in the æthiops mineral. Mr. Haſtfer re- commends here rhue mixed with antimony.

Chriſtopher Baldwin, Eſq. of Clapham, in Sur- ry, has found burnet to be remarkably efficacious in the cure of the rot, as appears from a letter of his publiſhed in a well-intended and very uſeful work, called *The Repoſitory for ſelect Papers on Agri- culture, Arts, and Manufactures*, begun in 1768,

but unfortunately dropt at the end of only a ſecond volume; and a farmer in the North, in the autumn of the year 1766, when all his ſheep were ſo far gone in the rot that he did expect one of them to live the winter over, ſent them into a field of burnet, which, in a month's time, reſtored them to perfect health.

The Memoirs of the Royal Society of Agriculture at Rouen informs us (*b*), that one of their members had recommended parſley as a good remedy for ſeveral of the diſeaſes to which ſheep are ſubject, ſuch as pimples, the ſmall-pox, running at the noſe, the itch, &c. and that it had been found to anſwer, when tried by a dealer in ſheep, whom they name. The way of uſing it is, to turn the diſeaſed ſheep faſting into a field of parſley, and leave them there for a quarter of an hour a day during eight days. The parſley will grow again, ſo as to yield ſeed, or may be cut and dried for ſheep that are ill in the winter.

When ſheep have ſwallowed any live creature, ſuch as ſpiders, caterpillars, leeches, &c. the beſt way of treating them is the ſame as uſed for horſes in a ſimilar caſe.

SECT. VI.

Of the Dropſy.

SHEEP are ſubject to a watery ſwelling, which frequently affects the whole body; and is at firſt diſcovered by the head's becoming larger, particularly under the lower-jaw, where the water is

(*b*) *Page* 28.

collected into a kind of bag, and by the body's being ſwelled.

The cure ſhould begin with antimonial purges, keeping the ſheep at the ſame time on dry food.—A full pint of ſtrong decoction of the leſſer ſpecies of ſedum *(ſedum minus)* given to a ſheep as ſoon as this diſeaſe is perceived, is ſaid to be an excellent remedy in caſes of this kind. It purges ſtrongly.

Likewiſe the following is recommended by Mr. Haſtfer (*a*), as very efficacious for ſheep that have the dropſy.—After purging them, which ſhould always be the firſt thing done in this diſeaſe, take of dried wormwood, either powdered or cropt ſmall, of parſley picked clean and ſhred ſmall, of bark of elder pounded or ground, a quart each; alſo a gallon of ſtrong ſea-ſalt well pounded, and a full quart of oat-meal, or as much as may be wanted to make the whole into a paſte. Put all theſe ingredients into a kneeding-trough, mix them well together, and knead them into a paſte with good river-water. Make this paſte into pellets about the bigneſs of a walnut, and give to each ſheep faſting two or three of them, according to its ſize and age. The ſheep muſt remain houſed for three or four hours after they have taken this remedy, and then they may be walked out, if the weather is fair and dry, but with great care to keep them from water all that day. If the weather be bad, the beſt way is to feed them that day and the following night in their cote, with ſtraw, or other dry food.

The way to make them take this remedy, at leaſt till they become accuſtomed to it, is, to thruſt the pellets down their throat with one's

(*a*) *Part II. p* 213.

fingers: but they will ſoon eat them of their own accord, if they are only laid in the crib.

Theſe balls are uſed every year in the ſheep-cotes of Hojentorp and Berga, in Sweden, and have been found to be a certain cure for the dropſy in ſheep. The above-mentioned quantity of ingredients will make from 170 to 180 balls, which are ſufficient for ſixty old ſheep, or eighty or ninety young ones, or lambs.

In caſe the neceſſary ingredients cannot be had in the country, take for ten or twelve ſheep the value of five or ſix quarts of oatmeal, and dry it well in an oven, or over the fire, in a pot or pan, then mix with it ſalt and bay-berries dried and pounded, of each a good pint, half a pint of powdered wormwood, an ounce of laurel-berries pounded, and a pint of nettles with their ſeed dried and pounded. All this being well mixed together, it may be given to the ſheep in a trough or crib made on purpoſe for that end, or it may be divided into portions of a pint for each ſheep, and given in the morning faſting, with care not to let them eat any thing elſe till two or three hours after, at the end of which they may have hay or dry ſtraw; but they ſhould not be ſuffered to drink that day. This ſhould be continued twice a week ſo long as is neneceſſary, and in proportion as the diſtemper is more or leſs obſtinate. One may likewiſe from time to time, offer them wormwood-water to drink.

If the ſheep refuſe to take the medicine thus prepared, let ſome oats be ground, and a paſte made of their meal, with the other ingredients, to which may be added for each ſheep three or four drops of oil of ſoot, and of bark of the birch-tree. Let the ſame number of balls be made of it as was before ſaid, and given to the ſheep in the ſame manner.

Another remedy is made thus: Take four pounds of rhue, ſhred it fine, put it into a tub, pour upon it ſix or eight gallons of boiling water, cover the tub, and let it remain to infuſe ſix hours: then ſtrain the water off through linen, and put in as much ſugar as will make an egg ſwim upon it.

When ſheep are dropſical, two ſpoonfuls of this are given them evening and morning, till they are cured: but as a preſervative, only one ſpoonful is given them, evening and morning, twice a week. Five ſpoonfuls of it are given, evening and morning, to large cattle, in the ſame manner as it is given to the ſmall. Alſo, a mole may be taken, cleaned, and dried, then pounded, and when a ſheep or other animal is ſeized with the hydrophobia, let the bigneſs of a pea, or of a ſmall bean, be given to it in a ſpoonful of beer. This remedy has been repeatedly tried, and found ſucceſsful (*b*).

(*b*) *Haſſer, part II. p.* 218.

BOOK V.

Of GOATS.

THE Goat is naturally more ſagacious and better able to ſhift for itſelf than the ſheep: it comes readily to man, ſoon grows familiar, is ſenſible to careſſes, and capable of attachment; it is alſo ſtronger, and leſs timorous than the ſheep. It is quick in its motions, capricious, more lively, nimble, obſtinate, and ſo fond of roving, that the ſtrongeſt and moſt active man cannot drive above fifty goats at a time; conſequently it is difficult to keep them in herds. They are fond of ſtraying in ſolitary places, of climbing up craggy mountains, of ſtanding and even ſleeping on the ſummits of rocks and the brinks of precipices. The moſt ſcorching rays of the ſun never incommode them; they are not frightened by ſtorms, and they bear rain quietly, but they ſeem to be affected by great cold. There is ſcarely a ſpot ſo barren as not to afford them ſufficient ſuſtenance, for they will browſe even upon thorny ſhrubs; and very few ſorts of herbs diſagree with them, even hemlock not excepted, which is poiſon to other animals.

Goats are naturally ſo fond of man, that they never become wild near inhabited places. As a proof of this; in the year 1698, an Engliſh ſhip having put in at the iſland of Bona Viſta, two negroes came on board, and after ſome intercourſe told the Engliſh that they ſhould be welcome to as many he-goats as they pleaſed. The captain ex-

preſſing ſome ſurpriſe at this offer, the negroes anſwered, that there were only twelve perſons on the whole iſland, and that the goats had increaſed ſo prodigiouſly as to be even troubleſome; and that they were ſo far from being difficult to catch, that they would follow a man like tame animals.

The moſt uſual colours of goats are white and black; ſome are entirely white, and others wholly black; but generally white and black, and often with a mixture of brown and ſallow. The hair is of an unequal length on different parts of the body; every where ſtronger than that of horſes, but leſs harſh than that of the horſe's mane; and there have been inſtances of its being intermixed with tufts of a whitiſh wool, as long as the hair, on the back and upper parts of the ſides. The beard of a he-goat, which M. de Buffon meaſured, was nine inches long, and its mane, towards the withers, was ſix inches in length. On the reſt of the body, the hair was in general about three inches long, but ſomewhat more on the paſterns and coronet.

The male-goat is capable of engendering at a year old, and the female at ſeven months; but the kids of this forward commerce are weak and defective; for which reaſon they are generally both reſtrained from copulation till eighteen months, or two years. The he-goat, beſides being no deſpicable animal, is ſo very vigorous and ſallacious, that one will be ſufficient for above an hundred and fifty ſhe-goats, during two or three months; but this ardour conſumes him, and never laſts above three or four years; ſo that he becomes enervated, and even old, before he has reached his ſixth or ſeventh year.

Such is the diſpoſition of the ſhe-goat, that the fickleneſs of her temper is plainly ſeen from the irregularity of her actions. She walks, ſtops, runs, ſkips, leaps, draws near, flies off, appears in ſight,

hides herſelf, or flies away, as by caprice, and without any other determining cauſe than the unaccountable vivacity of her internal ſentiments; and all the ſuppleneſs of her limbs, and vigour of her body, can hardly anſwer the wantonneſs and rapidity of theſe motions, which are purely natural.

For propagation, the he-goat ſhould be young, and of a good figure; that is, about two years old, and of a large ſize; his neck ſhort and fleſhy, his head ſlender, his ears long and lapping, his thighs large, his legs firm, his hair black, thick, and ſoft, and his beard long and buſhy. The ſhe-goat ſhould have a large body, full rump, large thighs, light head, capacious udder, long teats, and ſoft and thick hair. Their uſual ſeaſon of heat is during the months of September, October and November; but at any other time, if they happen to be near the male, they are ſoon diſpoſed to admit him; for they can copulate and yean at any time of the year. They however, retain beſt in autumn; and the months of October and November are preferred, in order that the young kids may find a ſoft, ſucculent herbage, when they firſt begin to feed: for the ſhe-goat goes five months, yeans at the beginning of the ſixth, and ſuckles her kids about a month or five weeks. Generally, indeed, ſhe brings only one kid; though ſometimes ſhe has two, very ſeldom three, but never above four. Theſe creatures ſometimes ſuffer greatly in yeaning, and therefore they ſhould be watched, in order to be aſſiſted in caſe of need.

Goats are turned out to feed very early in the morning, before the dew is off the graſs; becauſe this, though pernicious to ſheep that are not fattening, is extremely palatable, and even wholeſome, to theſe animals. In ſnowy and wet weather, they are kept under cover, and fed with

herbage, ſmall boughs of trees gathered in autumn, cabbages, turnips, and the like. Plentiful feeding increaſes their milk; and to keep up, or ſtill augment its quantity, they ſhould be made frequently to drink water mixed with nitre and ſalt. They may be milked in a fortnight after yeaning, and during four or five months they yield plenty of milk morning and evening.

When goats are driven with ſheep, as ſometimes happens, they always take the lead of the flock: but it is better to feed them ſeparately on high grounds, hills, mountains, and ſuch like places, in which they take moſt delight. Heaths, fallows, commons, and barren grounds will afford them as much food as they want: but they muſt never be ſuffered to feed in cultivated lands, corn-fields, vine-yards, or woods, becauſe they would browſe greedily on the young ſhoots, or the bark of the trees, and thereby do great damage.

The he-goat readily copulates with the ewe, as the aſs does with the mare; and the ram joins himſelf with the ſhe-goat, as the ſtallion does with the ſhe-aſs. But, though theſe copulations are ſufficiently frequent, and ſometimes prolific, no intermediate ſpecies has been formed between the goat and the ſheep: they are abſolutely diſtinct, continue always ſeparated, and always at the ſame diſtance, without having been the leaſt altered by ſuch mixtures.

Goats cannot endure damp places, marſhes, or rich paſtures: few of them are bred in flat and open countries, becauſe they generally are ſickly there, and their fleſh is of a bad quality: but in moſt hot climates they are bred in great abundance, without any ſhelter over them; whereas in colder regions, the winters would kill them if they were not houſed. In ſummer they do well without litter, but in winter they require it; and as all wet is very hurtful to

them, they ſhould not be ſuffered to lie in their dung, but have freſh litter as often as needful.

The ſhe-goat is prolific to the age of ſeven years, and the he-goat might certainly retain his generative faculty to that, or even a greater age, if he was ſuffered to be with the females only at proper times: but he ſeldom ſerves longer than five years, which bring him to about the ſame age: he is then caſtrated, and ſent to fatten with old ſhe-goats, and young he-goats caſtrated at ſix months, for that is the uſual time, in order to render their fleſh more tender and juicy. They are fattened in the ſame manner as ſheep: but neither care nor aliment, of any kind whatever, can poſſibly render their fleſh equal to that of the ſheep, unleſs, perhaps, it be in hot climates, where mutton is always flabby and ill-taſted. However, the ſtrong ſmell of the he-goat does not proceed from his fleſh, but from his ſkin; and the older he is, the ranker that will be.

M. de Buffon ſays (*a*) that theſe animals might live to the age of ten or twelve years, if they were not killed, when fattened, after being paſt engendering; and I cannot but be of the opinion of that very judicious and experienced naturaliſt; conſequently, the Chaplain to the Centurian's telling us in his account of Lord Anſon's voyage, that they found upon the iſland of Juan Fernandez a he-goat, which, from the ſlits in his ears, appeared to have been formerly under the power of one Selkirk, who lived ſeveral years on that iſland, and had quitted it above two and thirty years before their arrival, appears to me, ſuppoſing it to be literally true, nothing more than one of thoſe exceptions to a general rule, which M. de Buffon himſelf apprizes us will ſometimes happen.

(*a*) *Hiſtoire Naturelle de la Chévre.*

The age of a goat may be known by its teeth, and by the knots in its horns, when it has any; for though both he and ſhe-goats generally have horns, there are many exceptions to the contrary; and as to their teeth, they have not any of the inciſory ones in their upper jaw, but thoſe of the under jaw are ſhed and recruited at the ſame times, and in the ſame order, as thoſe of ſheep. In the ſhe-goats, indeed the number of teeth is not always the ſame, but uſually leſs than in he-goats, whoſe hair is alſo harſher, and their beards and horns longer. Like the ox and ſheep, they have four ſtomachs, and chew the cud. They alſo differ greatly in the colour of their coats. Thoſe that are white and without horns are ſaid to yield the moſt milk, but the black are the ſtrongeſt and moſt robuſt.

Theſe creatures coſt little or nothing to bring up, as we have ſeen, and their value is by no means inconſiderable, if properly attended to; for their fleſh will always fetch ſomething, and their ſuet, hair, and ſkin, ſell at a good price, eſpecially the ſkins of kids, of which the fineſt gloves are made. The ſkin of the goat is preferred to that of the ſheep, and the fleſh of the kid is nearly equal to that of the lamb. They are leſs affected with the diſeaſes of any climate than ſheep are, and ſtand leſs in need of the aſſiſtance of man. Goat's milk is a part of the *materia medica*, frequently preſcribed in caſes of decay, and wholeſomer than that of the ewe: it curdles eaſily and makes excellent cheeſe; but as it contains only a ſmall proportion of butyrous particles, the cream ſhould not be ſeparated from it.

She-goats ſeem pleaſed with being ſucked, as they often are by children, to whom their milk is an excellent aliment. Like cows and ewes, they are apt to be ſucked by ſnakes, hedge-hogs, and

a bird called the goat-ſucker. They yield a greater quantity of milk than the ewe.

The ſpecies of goats extends much farther than that of the ſheep; ſeveral parts of the world affording goats like the Britiſh, with this exception only, that in very hot countries they are ſmaller, and in cold ones larger.

The Angola, or Syria goats, with their long, pendulous ears, and ſpiral horns, are of the ſame ſpecies with Britiſh, engendering and producing even in European climates. The ſhe-goats in particular, of this breed, like moſt other animals of Syria, have a very long, thick, wiry hair, ſo fine, that the ſtuffs made of it are not inferior to ſilks, and full as gloſſy; witneſs in particular the beautiful Bruſſels' camblets.

BOOK VI.

Of SWINE.

CHAP. I.

Of the Character, Properties, and Uſes of Swine.

OF all the quadrupeds that we know, or at leaſt, certainly of all thoſe that come under the huſbandman's care, the Hog appears to be the fouleſt, the moſt brutiſh, and the moſt apt to commit waſte wherever it goes. The defects of its figure ſeem to influence its diſpoſitions: all its ways are groſs, all its inclinations are filthy, and all its ſenſations concentrate in a furious luſt, and ſo eager a gluttony, that it devours indiſcriminately whatever comes in its way, not excepting, frequently, its own young immediately after they are born, and too often infants in the cradle; for, whenever theſe creatures meet with any thing fat, moiſt, or unctuous, they begin with licking, and ſoon after devour it. They are conſequently fond of blood, and bloody fleſh, which they will ſometimes even when putrid, to the great detriment of their health, though they do not, like the wolf, attack other animals on purpoſe to kill and devour them. So unbounded is their ravenous deſire to fill the vaſt capacity of their ſtomachs, and ſo undiſtinguiſhing is their taſte, that M. de

Buffon (*a*) declares he has ſeveral times ſeen a whole herd of theſe creatures, at their return from the fields, ſtop and gather round a heap of clay newly dug up, all of them licking this earth, though none of the moſt unctuous, and ſome of them ſwallowing a pretty large quantity of it. This demonſtrates their gluttony to be of a piece with their brutal nature: nor is their ſenſe of feeling leſs ſluggiſh than their taſte; for, not only the harſhneſs of their hair, the hardneſs of their ſkin, and the thickneſs of their fat, render them little ſenſible of blows, but even mice have been known to form lodgments in their backs, and to eat their very ſkin and fat, without their ſhowing any ſigns of feeling them. Their other ſenſes are indeed quick and acute enough: though ſtill they ſeem not to have any one clear ſentiment; for the young hardly know their own dam, or at leaſt are very apt to miſtake, and readily ſuck the firſt ſow that will let them. Fear and neceſſity probably impart a little more inſtinct and ſentiment to the wild race of hogs; for the young of theſe are ſtrongly attached to their mother, and ſhe, on her ſide, ſhows herſelf more careful to provide for their wants, than the tame ſow does: and as to the very great quickneſs of ſight, hearing and ſmell in hogs, eſpecially of the wild breed, it is ſo well known to the huntſmen who go in queſt of theſe creatures, and particularly of wild boars, that they find it neceſſary to watch for them in the night, to obſerve a profound ſilence, and to keep themſelves to the leeward, that the hogs may not ſcent the effluvia of their bodies, which affect the organs of ſmelling in theſe animals ſo ſtrongly at a conſiderable diſtance, that they immediately betake

(*a*) *Hiſtoire Naturelle du Cochon.*

themſelves to flight, as if aware of ſome impending danger*.

The natural defect in the ſenſes of taſte and feeling in twine, is alſo farther increaſed by a diſeaſe which renders them even abſolutely inſenſible, and which is not perhaps ſo much owing to the texture of their ſkin, as to their filthineſs, particularly in feeding, and eſpecially to their often eating putrid aliments: for neither the wild hog, which does not eat ſuch ordure, nor delight in mire as the tame one does, but generally ſubſiſts on acorns, maſt, and roots, and lives in dry places, nor a ſucking pig, is ſubject to this diſeaſe; whence it follows, that the way to preſerve the common hog from it is, to keep him in a clean ſtye, and to give him plenty of wholeſome food.

With all its defects, however, this animal is one of the moſt profitable that an inhabitant of the country can rear; for, beſides its young, which generally are very numerous, and always fetch a good price, its fleſh ſells for rather more than that

* The reader who is not acquainted with the method of hunting the wild boar, may not be diſpleaſed at the following addition, from M. de Buffon's Natural Hiſtory of the Hog. "The wild boar is, "moſt commonly, either hunted openly with dogs, or ſurpriſed and "killed by moon light. As he is not remarkably ſwift of foot, he "leaves a very ſtrong ſcent, and often wounds the dogs dangerouſly "in defending himſelf. For this reaſon, and becauſe it ſpoils their "ſcent, and breaks them to a ſlow pace, the good hounds uſed for "the ſtag and roe-buck, (or for the fox,) ſhould not be employed in "this hunting. Maſtifs, after a little training, will be fit for this "purpoſe: but only the oldeſt of theſe animals are to be thus attacked, "and they are eaſily known by their tracks. A wild boar of three "years is not eaſily run down; he paces over a great deal of ground "before he ſtops: whereas an old boar does not run far, but ſuffers "the dogs to come near him, and often ſtops to keep them at a bay. "In the day-time he generally keeps in his ſoil, which is almoſt "always ſituated in the thickeſt part of the wood, and when night "approaches he goes out in queſt of food. In ſummer, when the "grain is ripe, it is eaſy to ſurpriſe him among the corn and oats, "which he is ſure to viſit every night. As ſoon as he is killed, the "huntſmen cut out his teſticles; the ſmell of which is ſo ſtrong, that "if they were left only five or ſix hours in the dead body, all the fleſh "would be infected by it."

of the ox or ſheep, and its lard for near twice as much as their ſuet †. Likewiſe the fleſh of this animal takes ſalt better than that of any other, and keeps longer in this ſtate. Its blood, all parts of its bowels, its feet, and its tongue, are dreſſed and eaten. The fat of the inteſtines and cawl, which is very different from the lard, makes what is called the hog's greaſe: nor is the ſkin without its uſes, both ſaddles and ſieves being made of it; and of the briſtles are made various kinds of bruſhes, ſhoemakers' ends, &c. and lapidaries uſe them in poliſhing of diamonds. The dung of this animal is accounted a fine manure for fruit-trees.

CHAP. II.

Of Feeding and Fattening of Hogs.

THESE creatures are ſo very ſtubborn and untractable, that even an active man cannot well take care of more than fifty of them at a time. In autumn and winter, where it can be done, they are driven to ſuch woods as afford plenty of wild fruits: in ſummer, they feed beſt in moiſt and marſhy places, where they find worms and roots; and in ſpring they range the fallow fields. From the month of March to October, they are turned out twice a day to feed; in the morning from the time that the dew is exhaled till ten o'clock, and from two in the afternoon till the dew begins to return in the evening. In winter they are driven abroad but once a day, and then only when the weather is fine; becauſe the dew, ſnow, and rain

† The lard of the hog is the ſame as the ſuet of other animals.

rain are hurtful to them. Indeed, ſuch is their averſion to bad weather, that if a ſudden ſtorm comes on, or only a heavy ſhower of rain, away they run, full ſpeed, each endeavouring to be foremoſt, and all continually crying out, till they reach their ſtye, or ſome other place of ſhelter. The youngeſt cry moſt and loundeſt. This cry is very different from their uſual grunting: it is a cry of grief, reſembling that which they ſend forth when they are bound in order to be killed. The boar cries leſs than the ſow; and the wild boar is ſeldom heard to cry at all, unleſs when wounded in fighting with another. The wild ſow cries more frequently; and both, when ſurpriſed and terrified, ſnort with ſuch vehemence as to be heard at a conſiderable diſtance.

Theſe animals are very fond of worms, and particularly ſo of ſome roots, eſpecially thoſe of the wild carrot; and to come at theſe they turn up the earth with their ſnouts. The wild boar, whoſe head is longer and ſtronger than that of the common hog, delves deeper, and generally continues the furrow in a ſtrait line; whereas the tame hog digs only here and there, and at the ſame time more ſlightly: but as a great deal of damage is frequently done by this means, all hogs ſhould be carefully kept from cultivated lands, and ſuffered only to run in woods and fallows.

The common way of fattening hogs is, to give them plenty of barley, maſt, cabbage, and other greens boiled, and a great deal of water mixed with bran. By this means they acquire a thick ſtratum of ſeam, and are rendered ſufficiently fat, in two months: but this fat is neither very firm nor very white; and the fleſh, though good, is flabby. They may alſo be fattened at ſtill leſs expence in countries which abound in maſt, by driving them into the foreſts in autumn, when the

acorns, wild chefnuts, and beech-maſts are ripe. They there eat all kinds of wild fruits, and grow fat in a ſhort time; eſpecially if, at their return in the evening, plenty of luke-warm water be given them mixed with a little bran and the meal of tares; for this makes them ſleep, and increaſes their fleſh to ſuch a degree that they are ſometimes ſcarce able to move; but the fat thus acquired is diſagreeably oily. They likewiſe fatten ſooneſt in autumn, when the weather begins to grow cold, becauſe they then perſpire much leſs than in ſummer, and have greater plenty of food. But the beſt way of all to fatten them for their fleſh to acquire a fine flavour, and their fat to be firm and palatable, is, to ſhut them up for a fortnight or three weeks before they are to be killed, in a clean paved ſtye, without litter, and to feed them only with pure dry wheat, allowing them at the ſame time but very little drink. The hog thus treated ſhould be about a year old, full of fleſh, and previouſly half fattened; for the older the hog is, the longer time it requires to fatten, and its fleſh is alſo proportionably worſe.

Caſtration, which muſt always precede the fattening of any animal, is uſually performed on hogs at the age of ſix months, and either in ſpring or autumn; but never in very hot or very cold weather, becauſe each of theſe is equally dangerous to the wound, and renders its healing difficult; this operation, which every tinker knows how to do, is moſt commonly performed by inciſion, though ſometimes by a ligature only, as in the ram. Thoſe which have been caſtrated in the ſpring are generally fattened the next autumn, and commonly killed before they are two years old; though they grow very conſiderably in the ſecond year, and would continue ſo to do for ſeveral years longer; thoſe which are particularly remarkable for their

height and corpulence, being only creatures of a greater age, which have been turned out ſeveral years to feed on maſt. Their time of growth does not ſeem confined to four or even five years; for the boars which are kept for propagation continue to grow in their ſixth year; and the older a wild boar is, the larger and heavier he becomes. It is true, that the head of an old wild boar is the only part worth eating; whereas all the fleſh of the wild boar and ſow not a year old, is delicate, and of a fine grain; but the fleſh of the tame boar is ſtill worſe than that of the old wild boar, and can be rendered eatable only by caſtration and fattening, unleſs it be when made into brawn.

The antients uſed to caſtrate ſuch wild pigs as they could at any time find means to ſteal away from their mother, and afterwards carried them back into the woods: the caſtrated wild hogs not only exceeding the tame in bigneſs, but their fleſh being alſo better.

CHAP. III.

Of the Propagation of Swine.

BOTH the male and female of this ſpecies of animals are able to copulate when only nine months or a year old: but it is better to let them double that age before they are put together; for the firſt litter of a ſow, when ſhe is not a year old, conſiſts of only a few, and thoſe weak and even defective pigs. She may be ſaid to be in heat at all times; and even when ſhe is pregnant ſhe ſeeks the boar, which, among animals, may be deemed

an exceſs; the female in almoſt every ſpecies refuſing the male after ſhe has conceived. The heat of the ſow, which is almoſt continual, declares itſelf more particularly at intervals, by her emitting no ſmall quantity of a thick, whitiſh liquid, and by uncommonly violent motions which always end with her weltering in the mire. She goes four months, and farrows at the beginning of the fifth; ſoon after which ſhe again grows eager for the male, becomes pregnant a ſecond time, and thus farrows twice a year. The wild ſow, which reſembles the tame one in all other reſpects, farrows but once a year; probably becauſe of the ſcarcity of food, and the neceſſity ſhe is under of ſuckling and feeding all her litter for a conſiderable time: whereas the tame ſow is never ſuffered to ſuckle all her pigs above a fortnight or three weeks; after which eight or nine only are left with her, and the reſt are carried to market. They are fit for eating in a fortnight; and as few ſows are wanted, the caſtrated pigs being more profitable to rear, and their fleſh the beſt to eat, moſt of the ſow pigs are diſpoſed of, only two of theſe, and ſeven or eight boar pigs, being generally left with the ſow. She ſhould never be permitted to ſuckle any of her pigs above two months; and even at the end of three weeks it is beſt to drive them to the field with her, that they may by degrees accuſtom themſelves to feed as ſhe does. In about five weeks after this, they are weaned, and whey mixed with bran, or at leaſt warm water boiled with greens, is then given them morning and evening.

The boar for propagating ſhould be ſhort and thick of body, rather ſquare than long, with a large head, a flat ſhort ſnout, large flagging ears, ſmall fiery eyes, a large thick neck, a ſwagging belly, broad buttocks, ſhort thick legs, and thick and black briſtles, white hogs being never ſo ſtrong

as black. In the ſow, the body ſhould be long, the belly broad and capacious, and the teats long. She ſhould alſo be of a quiet diſpoſition, and taken from a fruitful breed. When pregnant, ſhe muſt be kept apart from the boar, or he would probably do her ſome miſchief; and when ſhe has farrowed, ſhe muſt be fed plentifully, and alſo watched, leſt ſhe ſhould devour ſome of her pigs: the boar eſpecially muſt be removed, for he would ſhow them ſtill leſs mercy. The ſow is commonly put to the boar in the beginning of ſpring, in order that, by farrowing in ſummer, her pigs may have time to grow and gather ſtrength and fleſh before winter: but when it is intended that ſhe ſhould farrow twice a year, ſhe is had to the boar in November, that ſhe may farrow in March, and be again put to him in May. Some ſows farrow regularly every five months. The wild ſow, which, as was before obſerved, farrows but once a year, admits the boar in the months of January or February, and farrows in May or June. She ſuckles her young three or four months, leads them abroad, follows them, and keeps them from ſtraying, till they are three or four years old; ſo that it is not uncommon to ſee wild ſows with their young of the preſent and preceding year about them.

Wild boars are called *ſounders* during their firſt year, and *beaſts of company* till they are three years old, becauſe they keep together till that age, and never go alone till they are ſtrong enough to encounter the wolf: by this means theſe animals compoſe among themſelves a kind of ſquadron, and in this their ſafety conſiſts; for when they are attacked, the largeſt form themſelves into a cloſe circle round the leſſer, to keep off the enemy. The ſame method of defence is alſo practiſed by tame hogs; ſo that there is no occaſion to make uſe of dogs to ſecure them from beaſts of prey.

It is not uncommon for boars to live twenty-five or thirty years. Ariſtotle ſays, that hogs in general live twenty-years; and adds, that the boars engender, and the ſows bring forth, till the age of fifteen.

I cannot conclude this laſt chapter of my work, without continuing to obſerve with M. de Buffon, that this ſpecies of animals, though known, and even found in great plenty all over Europe, Aſia, and Africa had never been ſeen in America till it was carried thither by the Spaniards, who turned great numbers of black pigs looſe on the continent, and alſo on its larger iſlands, where they have increaſed prodigiouſly, and in ſeveral places become wild. They reſemble the European wild boars; but their body is ſhorter, their head larger, and their ſkin thicker than in other hogs, which in hot climates are totally black, like the wild boar.

A ridiculous prejudice, which owes its continuance to ſuperſtition, deprives the Mahometans of this animal: they are taught to look upon it as unclean, and ſo far from eating, that they dare not even touch it. The Chineſe, on the contrary, are very fond of hog's fleſh: it is their moſt common food, and is ſaid to have animated them to refuſe the doctrine of Mahomet. The Chineſe hogs, which are the ſame with thoſe of Siam and India, differ from thoſe of Europe, in that they are ſmaller, their legs conſiderably ſhorter, and their fleſh much whiter and more tender. Some perſons breed them here, and they copulate and engender with our common ſwine. The negroes alſo breed vaſt numbers of hogs; and though they are very ſcarce among the Moors, and in all Mahometan countries, wild boars abound as much in Aſia and Africa as in Europe.

CHAP. IV.

Of the Diſeaſes of Swine.

THE only diſeaſe that I know of which ſeems to be peculiar to ſwine, is a kind of leproſy, commonly called *meaſles*. When it ſeizes them, they become dull and ſleepy. If the tongue is pulled out, the palate and throat, will be found full of blackiſh ſpots, which appear alſo on the head, neck, and the whole body; the creature is ſcarce able to ſtand on its legs, and the roots of its briſtles are bloody.

As this diſorder proceeds chiefly from their gluttony and filth, the only way of preventing it is, as was ſaid before, to keep them clean; and the moſt probable way to remedy it is, to put the diſeaſed hogs into a ſeparate clean ſtye, and there give them wholeſome food; to waſh them carefully, and let them have plenty of water to wallow in: antimony, and its preparations, will alſo be of ſervice to them.

BOOK VII.

Of the CONTAGIOUS DISEASES of CATTLE.*

THE contagious diſeaſes which have attacked cattle at different times are not all of the ſame nature. The authors who have noticed them, have given different deſcriptions of them. I ſhall firſt deſcribe thoſe of which they have ſpoken, and then proceed to thoſe which have appeared in our days. It muſt be from a knowledge of what was obſerved in former epidemics, that we can learn to guard againſt the dire effects of future ones; for it is but too certain, that thoſe which have already appeared will appear again, as there will hereafter be occaſion to remark; and the proper treatment of diſeaſes which may hereafter attack cattle, can be learnt only by conſidering what was done for them before: for, as in the cure of diſeaſes incident to men, ſo in thoſe of animals, experience is all in all. Experience makes us acquainted with each ſpecies of malady, its genus, the different cauſes which have contributed to its production, the remedies which have been applied, and their effects. "Be always mindful," ſays Hippocrates (*a*), "of whatever has cured diſeaſes, of

* Abridged from *Mémoire ſur les Maladies épidémique des Beſtiaux, par M. Barberet, M. D.* to which the Royal Society of Agriculture at Paris adjudged their premium for the year 1765, and of which they were pleaſed to tranſmit a copy to the writer of this work.

(*a*) *Lib. de decent. Ornat.* § 8.

" the appearances under which thoſe diſeaſes have " ſhown themſelves, of the changes they have un- " dergone, and of the different manners in which " they have affected different creatures; for this " is, in phyſic, the beginning, the middle, and the " end."

The antients afford us but little inſtruction concerning the contagious diſeaſes of cattle, a ſcourge which ſo often ſweeps away whole herds; for they ſcarcely enter into any deſcription of them. Virgil, at the end of his third Georgic, deſcribes, indeed, a mortality amongſt cattle; but what he ſays is rather the flight of a poet's imagination, painting the ravages of any epidemic diſorder, than the deſcription of a particular one: and though we find in Celſus preſcriptions for many maladies of horſes, oxen, and ſheep; yet he has not given us a deſcription of any epidemic diſorder: nor is Columella at all accurate in his deſcription of the contagious diſeaſes of cattle.

We muſt therefore come ſo far down as Ramazzini, who, in his account of the epidemical conſtitution of the year 1690, at Modena, ſays, that the ſeaſon was cold and moiſt, and that the reigning diſtempers of that year attacked all the people who lived in the country, and ſpread itſelf indiſcriminately amongſt all kinds of animals, of which great numbers died after a few days illneſs. Nature made ſtrong efforts to diſengage herſelf from the diſeaſe by a critical diſcharge on the thighs, neck, and head, reſembling the puſtules of the ſmall-pox. Moſt of the animals which had this appearance loſt their eye-ſight. Thoſe creatures which were not carried off by this diſeaſe, but reſiſted its violence, loſt their fleſh by degrees, and fell into a maraſmus. Ramazzini did not ſcruple to declare theſe puſtules to be the ſmall-pox; for they differed not from it in form, in colour, or in

the matter which they contained, nor in ſize, nor in the manner in which they went off: when they had dried off after the ſuppuration, they left a black ſcar, like to that which remains after the ſmall-pox.

This epidemic contagion continued in 1691, and attacked chiefly the ſheep, ſo violently that the breed was almoſt deſtroyed: (*Ita ut ovilus grex pene deletus fuerit.* Ramaz. p. 42.) It has been conſtantly obſerved, that, of all the animals, ſheep are the moſt ſubject to the ſmall-pox. The French call it, in them, *clavin*, or *claveaux*, and I ſhall ſpeak more fully of it hereafter. It was therefore to be expected that they ſhould be particularly affected by it, ſince they are more diſpoſed to it than other cattle.

In 1693, Heſſe ſaw her herds carried off by a pulmonary phthiſis. (Conſt. epid. Haſſiac. ann. 1691.) The winter of that year began with rain, and ended with very ſevere cold: an extraordinary warmth which commenced in the ſpring, and continued during the whole ſummer, took place all at once of the former cold. Such ſudden changes always occaſion unuſual motion in the fluids, and frequently obſtructions in the capillary veſſels; and hence it ſeldom happens but that a ſudden change from cold to heat brings on epidemical diſeaſes: yet the diſorder which then reigned in Heſſe was alſo attributed to a blight, or corroſive dew, which fell on the paſtures in 1693, in the ſame manner as the paſtures in Italy had been infected in 1690. Beſides theſe cauſes, the above-quoted obſerver imputes the diſorders to the coldneſs of the water, which, the animals drinking greedily of it whilſt they were very hot, contributed much to the pulmonary phthiſis: for if a man in a great ſweat drinks a draught of ice-water, it is to be feared that he will be ſeized with a pleuriſy

or peripneumony. The caſe is the ſame with animals.

The ſpring of the year we are ſpeaking of being very warm, the bullocks and cows, heated both by the warmth of the ſeaſon, and by the devouring fire which raged in their bowels, through the infected quality of the plants they had fed on, ran to the coldeſt water they could find. One of the firſt effects of cold is to condenſe fluids, and to leſſen the diameters of veſſels. The fibres of the capillary veſſels, being contracted by the action of the cold, ſtopped and returned the blood which before flowed freely in thoſe veſſels, and from thence proceeded an inflammation. When this happens to a conſiderable number of veſſels, they burſt, and their coats, with their contents, turn to pus, or that matter which we ſee in boils. This is what happened in Heſſe: the inflammation, at firſt neglected, ſuppurated, and the cattle ſunk under a pulmonary phthiſis.

In the year 1712, they were attacked in Lower Hungary with a moſt dangerous diſtemper, (*Conſt. epid. inter Hunger. ann.* 1712.) The winter had been extremely cold, and the ſpring rainy, with great changes in the temperature of the atmoſphere; for on the ſame day the morning was cold, the middle of the day very warm, the cold began again about three o'clock, and the evening became warm. Theſe changes occaſioned amongſt men many fevers, which were as irregular as the ſeaſon. In the months of June and July, during which the weather continued conſtantly warm, there appeared a prodigious number of inſects, reptiles, and particularly ſerpents which killed many perſons in the country. Their bite brought on a ſwelling which ſpread very faſt all over the body, and particularly to the tongue, ſo that the ſick could not utter a word. The cattle were not leſs ſubject to the bite

of theſe ſerpents, than the men; and accordingly the mortality among them was very great.

In Auguſt, which was very rainy, the mortality increaſed, but by a new kind of diſorder, which ſhowed itſelf by white puſtules filled with matter inſufferably ſtinking. A liquor of a cadaverous ſmell flowed from the mouths of the ſick cattle; it was with the utmoſt difficulty that they breathed: the bullocks and cows ſeized with this diſorder bellowed conſtantly, and without intermiſſion, as death approached. A noiſe was then heard in their bowels, as if the coats of their inteſtines, diſtended too much, burſt. Though the obſerver does not mention it, yet every circumſtance, eſpecially the puſtules, declare this diſtemper to have been the ſmall-pox complicated with ſome other diſorder. The liquor which flowed from the mouth greatly reſembled the ſpitting which comes on in men in the ſmall-pox. The difficulty of breathing, the ſtench of the breath, and the infectious ſmell of the puſtules, are ſymptoms which conſtantly attend the *clavin* or ſmall-pox in ſheep, when the diſeaſe is violent or accompanied with putrefaction.

In the ſtomach of the animals which were opened were found balls of the ſize of a wallnut, filled with hair, and covered with a membranous tunic, ſo hard that it could ſcarcely be cut with a knife. This membranous tunic is uncommon; for the egagropiles are not organized bodies.

This mortality ſpread even to the wild beaſts, ſeveral of which were found dead in the foreſts. The dogs which ate of their fleſh, or that of any of the animals that died of the contagion, became mad; and the men who were bitten by them were ſeized with the hydrophobia.

The changeableneſs of the ſeaſon had a great ſhare in the epidemic here ſpoken of, and the mul-

titude of reptiles contributed to render it ſtill more dangerous to cattle: for the great number of inſects which adhered to the graſs they fed upon, might cauſe as many diſorders as the blight before mentioned; becauſe all animal ſubſtances are of a more ſeptic quality than graſs, which is the natural food of cattle.

The epidemic diſeaſe of 1711 (*b*), which made ſuch havock in Italy and Germany, came originally from Hungary, by means of bullocks brought from that country: for there appeared nothing in the conſtitution of the air, nor in the food, that could give riſe to it; nor did it affect cattle which had no communication with thoſe that came from Hungary. The infection ſeemed to be communicated by their ſaliva dropped on the graſs; ſo that ſound cattle, which afterwards fed on the ſame paſture, contracted this diſorder with which the others were infected.

The virus, which was communicated by the ſaliva, was ſo extremely acrid, that it acted as a cauſtic on the gullet, ſtomach, and inteſtines, affected the nervous ſyſtem, occaſioned ſpaſms, contracted the fibres, and cauſed obſtructions in the capillary veſſels: the fluids conſequently became putrid, and the bowels were ſeized with gangrenous inflammations. The diſeaſe was attended with a burning heat, a total loſs of appetite, a difficulty of breathing: in ſome bullocks the tongue was inflamed and covered with many red bliſters; the ſtomach, the epiploon, and eſpecially the inteſtines, were alſo inflamed; the parts near the liver were of the colour of the bile; the excrements were purulent, tinged with blood, and of an inſufferable ſtench, ſo that, ſays the obſerver who has left us this account, the diſorder aſſumed the appearance

(*b*) *Conſt. Epidem. Auguſt. ann.* 1711, 1712.

of a malignant dyſentery: and yet the dyſentery here certainly was only ſymptomatic.

The mortality amongſt the cattle ceaſed but very little during the winter, and began again the next year: the cauſe, however, did not ſeem to be the ſame; for the epidemic diſorder in 1712 appeared with different ſymptoms. It firſt attacked the horſes, eſpecially thoſe which were in the neighbourhood of Augſburgh; yet almoſt all that were in the town eſcaped. It afterwards ſpread to the bullocks and cows, and to many other animals of different kinds. On the breaſt, groin, and many other parts, there aroſe hard tumours, which extended greatly, and ſoon carried off the cattle affected with them. This diſorder ſeems to have been the conſequence of that of the former year; the hard tumours and the ſymptoms attending them being imputed to the ſting of hornets, of which there was an incredible number in 1712, of an uncommonly large ſize. It was ſaid that they fed on the bodies of the cattle which died the year before, and had not been buried ſufficiently deep. That the ſting of theſe hornets bred in and fed on infection, could not but be dangerous, will appear from the following event, which ſhows to how great a degree the juices were altered.

A man intending to chop off the foot of a horſe which had died of the ſting of a hornet, and had not been buried deep enough, the foot appearing above ground, ſome drops of the juices ſplaſhed about by the hatchet he made uſe of flew into one of his eyes, and cauſed there an inflammation and ſwelling, which ſoon extended to the other eye, afterwards over the whole head, and finally killed him.

Lanciſi informs us, that the wiſe precautions of Pope Clement XI. preſerved for two years the ſtates ſubject to him, from the contagious diſeaſe

which a bullock had brought from Hungary into the diſtrict of Padua, from whence it ſpread all over the Venetian territories and the Milaneſe, and at length penetrated into the kingdom of Naples. In the middle of the ſummer of 1713, information was received, that ſome drovers were conducting a great number of cattle to the fair of Fruſino, a town in the eccleſiaſtical ſtate, but bordering on the kingdom of Naples. To prevent all danger, orders were immediately given, that the fair ſhould not be held. The drovers ſeeing the impoſſibility of ſelling their cattle as they had intended, led them through bye-ways to Rome. They were ſold at a low price; and being ſold again to the inhabitants of the towns and villages throughout that province, the infection was ſoon ſpread over the whole Campania of Rome. An exact regiſter was kept of all the cattle that died from the month of October, 1713, to the month of April, 1714, when the infection ceaſed in the eccleſiaſtical ſtate, and preſents us a ſhocking detail of the effects of that peſtilence, by which were deſtroyed 8466 oxen uſed for ploughing, 10125 white cows, 2816 red cows, 108 breeding bulls, 427 young bulls, 451 heifers, 2362 calves, 862 buffaloes, male and female, 635 young buffaloes, in all 26252 cattle in the ſpace of nine months. Lanciſi thinks, that if the computation had been begun from the 2d of Auguſt, the number of cattle which periſhed would have amounted to 30,000.

That author does great juſtice to the truly paternal care and ſolicitude ſhown by the Holy Father on this melancholy and fatal conjuncture. We may ſee by his account, that the ſpeedy extinction of a ſcourge which continued long to ravage other ſtates of Italy, was owing more to the Pope's prudent meaſures, than to medicines, which were found to be ineffectual. This evinces, that good

laws and active magiſtrates are frequently the moſt effectual ſafeguards againſt peſtilential diſeaſes.

This diſtemper ſhowed itſelf in ſome animals by lowings, by a kind of terror with which they were ſeized, by a thouſand different motions which ſeemed to ariſe from that terror, and by a ſudden and precipitate flight. Others, chiefly the weak, dropt down dead at once, as if they had been thunder-ſtruck. In almoſt all the reſt was obſerved a great dejection; they could hardly hold up their heads; their eyes were dull and full of tears; a ſurpriſing quantity of mucus flowed from the noſe, and of ſaliva from the mouth; the fever in them was very high; they were ſo dejected that they could not ſtand up; their hair ſtood on end; their tongue, mouth, and gullet, were inflamed, ulcerated, and more or leſs covered with bliſters: at firſt they ſhowed a great thirſt, but ſoon refuſed every kind of drink and food: many had a conſiderable purging; what they diſcharged was of different colours, always very fœtid, and ſometimes bloody. Moſt of them ſunk under the diſtemper in a week, being ſeized with the moſt violent oppreſſion. Their breath was inſufferably ſtinking, a ſtrong cough was frequently joined to all theſe ſymptoms, &c.

It was ſeldom that the appearances in the viſcera were alike in the creatures which died of this plague. The contagion fell ſometimes on one part, and ſometimes on another, ſeemingly according to the weakneſs of that particular part. This Lanciſi ſays he was convinced of by opening three bodies. Except the ſmall ulcers obſerved in the mouth, throat, æſophagus and paunch of each of them, and likewiſe the gangrenous ſpots obſerved in their lungs, all the other effects were totally different. In the paunch of the firſt, which died on

the third day of the diſeaſe, he found a maſs of the creature's laſt food, extremely hard, and what Pliny calls *juvencarum tophum*, that is, an ægagropile. The liver, inteſtines, and lungs of the ſecond, which died on the ſixth day, were intirely ſphacelated; the heart and brain of the third were become putrid maſſes, with ſcarcely any vaſcular appearance. He obſerved nothing particularly remarkable in the fluids.

The young and fat cattle, which had worked little and been well fed, were more eaſily affected by the diſtemper, and died ſooner, than the cattle which had been made lean by hard labour, and were come to a certain age.

Lanciſi thinks that the greater or leſs abundance of the fluids, and their flowing more or leſs freely through the veſſels, was the true cauſe of this difference; for the peſtilential ferment, ſays he, inſinuates itſelf more eaſily into the blood and ſpirits, and falls more ſeverely on the bowels, when it meets with a greater plenty of fluids liable to be corrupted, and with obſtacles which prevent its finding a paſſage out of the body.

Though the lean cattle did not eſcape the contagion, and though they generally died of it, yet ſome of them recovered; probably owing to the leſs interruption which the peſtilential ferment met with in them, than in thoſe that were fat.

What was very remarkable is, that moſt of the female buffaloes, which were ſeized with the plague when they ſuckled their young, did not die. Their teats were ulcerated all over, and none of their young eſcaped. Lanciſi is of opinion that the acrid venom taken in by the noſe of the mother, and with her food, flowed with the chyle into the blood, and by that means into the minuteſt veſſels of the udder. There it happily depoſited; and as part of the venom was taken off by their young,

and the reſt of it remained ſtopped at the extremity of the lactiferous veſſels ulcerated and corroded by that ſame ferment, the mothers, by means of theſe ſalutary ſores, frequently eſcaped death; perhaps as happens to men ſeized with the plague, who are often cured by a lucky ſuppuration of buboes.

In the year 1730, a great number of cattle died in Bohemia, Lithuania, Saxony, the Marche of Brandenburgh, and the Duchy of Magdeburgh (*Hiſt. Feb. Cantarrh. ann.* 1730.) but we have no account of the diſtemper which carried them off. Perhaps it might be like that which deſtroyed ſo many in ſome of the provinces of France in 1731, the firſt ſymptom of which was a white bliſter that appeared on the tongue. This bliſter afterwards became red, and ended with turning black and degenerating into a cancerous ulcer, which ate away, and, in a ſhort time, conſumed the whole tongue. It was very like an anthrax. This diſtemper was the more dangerous, becauſe there was no ſymptom which declared its approach; for the creature which was ſeized with it ate and drank as uſual, till the ulcer had made a conſiderable progreſs, and often nothing was perceived till it was too late to aſſiſt.

From the year 1740 to 1750, the horned cattle, not only in France, but all over Europe, died in vaſt numbers of a putrid, malignant, inflammatory fevers, like that which made ſuch havock in Germany and Italy in 1711, and which was called a malignant dyſentery. Of all the diſeaſes that have at any time attacked cattle, this ſeems to be the moſt dangerous, the moſt complicated, and the moſt difficult to cure. Its approach was indicated by a languor and general dejection: the beating of the heart was as quick again as in a natural ſtate, which denotes a very briſk fever. The ſick ani-

mal, hanging down its head, could hardly ſtand upon its feet; it tottered; its loins panted; its eyes were red and full of tears; its horns and ears were cold; a thick, glutinous ſlaver ran from its noſe and mouth; and a convulſive motion was apparent from the head all along the back. The other ſymptoms were ſimilar to thoſe before mentioned in ſpeaking of the epidemical diſeaſe of Augſburgh.

In 1756, the French loſt a great number of cattle in Minorca. Theſe animals, tranſported thither from Auvergne, were little accuſtomed to the heat of a climate where they were expoſed all day long to the burning rays of the ſun: for, excepting the middle of the iſland, ſcarce any ſhade is to be found in it. This became the more grievous to them as they naturally delight in a cold climate, and in ſuch it is that they thrive beſt. In fact, the cattle of Denmark, Podolia, and Ukraine, are the largeſt, and next to them thoſe of Ireland and England, whilſt thoſe of Spain and Barbary are the ſmalleſt. They found not in Minorca any thing that could allay in their bowels a heat which they had not felt elſewhere. They had no cooling graſs, for all is burnt up in that iſland by the month of May. The water, being every where warm, and in many places brackiſh, afforded but little refreſhment to creatures which love it cool and pure. They languiſhed, and loſt their fleſh viſibly from day to day: their breath was hot, and they ended with piſſing blood.

We were terrified in 1762 with accounts of an epidemic diſeaſe which made great havock in Denmark, and had advanced to the frontiers of Germany. The following is an account of it, ſent to one of the members of the Royal Society of Agriculture at Paris.

" The contagion ſpread with great rapidity; the

" youngeſt, the moſt robuſt, and the moſt healthy " cattle, were the firſt ſeized with it, and died the " ſooneſt. In moſt of them a cough was the " ſymptom of the diſeaſe. Their eyes became dull, " watery, and bleared; and even tears trickled " from them. In a day or two after the cows " were thus ſeized, their milk dried up, and this " was a ſure ſign that the contagion had reached " them. In the beginning, the creatures were " cold even to ſhivering, nearly as men are on the " firſt attack of a fever. A heat ſucceeded, and " continued for ſeveral days: it was moſt percepti- " ble at the nape of the neck, either by the heat " itſelf, or by the beating of the pulſe. The ſick " animal loſt its appetite for eating, but continued " to drink freely till the inflammation deprived it " of the power of ſwallowing. A great quantity " of inſufferably-ſtinking, ſnotty matter, flowed " from the noſe, and the teeth became looſe in " moſt of them. Some became coſtive; but in " much the greater number a diarrhœa came on " in the beginning, with a diſcharge of ſcarce any " thing except water, with very little excrement. " Towards the end of the diſeaſe, the two laſt " joints of the tail became ſoft and rotten: if the " ſkin which covered them was opened, there came " out a fœtid, purulent matter. The gangrene " proceeded by degrees even to the horns, which " became cold and empty. When the ears and noſe " became cold, the diſeaſe was in the laſt ſtage; " and then it was that the animal generally died " on the ſixth or ſeventh day from its being taken " ill.

" On opening the dead bodies, the gall-bladder " was found greatly enlarged, and full of a liquor " more like urine than bile. In ſome of them " there was even three pounds weight of this li- " quor in the bladder; in many, the ſtomach and

" inteſtines were full of worms, yet alive at the " opening of the body. There were likewiſe in " the blood-veſſels certain inſects called *plaice*, be- " cauſe of the reſemblance of their ſhape to that of " the fiſh ſo named. Sometimes the brain ap- " peared diſſolved into a purulent water. In ma- " ny, the veins were full of black blood. Numbers " had the neck inflamed. In others, the inflam- " mation fell on the bowels, and ſometimes ano- " ther part of them was found gangrened. The " ſtomachs were full of food not digeſted; and " that food was ſo dry, and ſo much compacted " together, that it could not be ſeparated without " great difficulty. Livid and black ſpots on the " ſtomach and inteſtines ſhowed evidently a gan- " grene. In ſome animals, the liver and ſpleen " were covered with ſmall tumours, ſo hard that " they could not be broken, and they felt like " grains of ſmall ſand under the fingers; while the " reſt of the ſubſtance of theſe viſcera was, on the " contrary, ſo ſoft, that it could ſcarcely be " touched without piercing into it. Some dead " bodies afforded no ſign of any diſtemper. The " blood that was taken from the animals was of a " clear red, and diſcovered ſigns of great inflam- " mation by its frothing and ſmoaking, and not " having any liquid in it after it had cooled: the " whole was one coagulated maſs, which might be " cut like a jelly."

In the years 1746, 1754, 1761, and 1762, there appeared among the ſheep in the neighbourhood of Beauvais (in Picardy) a contagious diſeaſe which the French commonly call *clavin*, or *claveau*, and which is in fact no other than the ſmall-pox, as was before obſerved. It is, of all the contagious diſtempers which affect ſheep, the moſt eaſily communicated, and that to which they are the moſt liable. Like the ſmall-pox, too, it is diſtinguiſhed

into the diſtinct or mild, and the confluent or malignant.

The Royal Society of Agriculture at Paris having received the following very particular account of this diſeaſe, as it appeared in 1762, from M. Borel, Lieutenant-General of Beauvais, and Member of the Society of Agriculture of that city, gladly pay him the tribute of praiſe juſtly due to the zeal and diligence which he manifeſted on this occaſion. He himſelf examined the condition of the ſheep in many villages and hamlets, in order to become perfectly acquainted with the ſymptoms of the diſorder, which he has deſcribed with a preciſion that ſhows he judged and ſaw with his own eyes.

The diſorder manifeſted itſelf by a want of appetite and a dejection in the animal. Some perceived it twenty-four hours before the eruption; the moſt attentive perceived it two or three days ſooner; but the greater part did not notice it till after the eruption had begun. The diſguſt was proportioned to the degree of the malady; for the ſheep that were affected continued to eat, thoſe that were moſt ſeverely attacked took no food of their own accord, people ſupported them as well as they could; they were very thirſty, and water was given to them all. As ſoon as they were ſeized with the diſorder, they ceaſed to chew the cud; their eyes were heavy, ſwelled, and watery; they became very dim, and frequently the eye-lids were ſo glued together, that the creatures could not ſee. Many of thoſe which had been cured had loſt one eye, and others were quite blind: a depoſite or tranſlation of the pocky matter being made, brought on a ſuppuration which deſtroyed the whole ſubſtance of one or both eyes; but theſe depoſites contributed much to a recovery. There flowed from the noſe a thick, tough matter, of the

colour of pus, generally white, ſeldom yellow. Their ſtrength failing them to follow the flock, they laid down, and remained in the place where it may be ſaid they fell. Their ears were very cold; though this was not always the caſe. They were quite motionleſs, and collected into the ſmalleſt compaſs poſſible, with the head inclining as much as could be to the ground, the tail drawn in between the legs, and the hinder parts brought near to the fore ones, without ſeeming to be griped. The oppreſſion they laboured under was in proportion to the violence of the diſorder. When the attack was mortal, they groaned during the laſt twenty-four hours of life, and their loins palpitated ſtrongly. If they recovered, their wool fell off from the places where there had been an eruption. Their excrements were nearly the ſame as in a ſtate of health, but rather dryer, and blacker than in the natural ſtate. The pimples reſembled exactly thoſe of the ſmall-pox. They were of different forms and different colours. Some were perfectly round and diſtinct; others confluent, and of an eliptical ſhape. All of them were at firſt red and hard. The diſtinct ſort became afterwards white and ſoft, ſuppurated, dried up, and fell off in ſcales. In the confluent kind the pimples were ſo near together that they touched each other; they became of a purple colour, and inſtead of riſing and turning white, they appeared flat and became black. The fever, heat, thirſt, and dejection continued, attended with a difficulty of breathing, and working in the loins. Some died ſo early as third day after the eruption. The more the head was affected, the greater was the danger, and the ſpeedier the death. Thoſe that outlived the diſorder, were long in recovering. Some did not recover in leſs than two months, others at the end of ſix weeks, or a month: in

the diſtinct kind, they generally recovered in a fortnight: but in both ſorts, ſeveral died at the end of theſe periods. People were at firſt of opinion, that the ſheep fed in moiſt paſtures were more liable to be ſeized with this diſorder than thoſe fed in dry paſtures: but it was afterwards obſerved that there was not any difference between them. The ſheep were ſeized in the winter as well as in the ſummer. In ſeveral places the infection ſpread without any immediate communication with the ſick ſheep: in others, it ſeemed to be the effect of their coming near to one another. The eruption appeared chiefly on the head, on the inſide of the fore and hind legs, on the belly, and around the anus. Some ſheep had but very few pimples. Theſe the country people called the flying ſmallpox. Some had pimples only on their legs, others on their ears only, and ſome again had only one cluſter of the breadth of a crown-piece. A ſheep had ſuch a cluſter on one ear, which it treated ſo roughly, that the ear remained curled up, and diſplaced from its natural poſition. Another had one on its foot; the hoof fell off, and the creature remained lame ever after. The eruption was generally complete by the fourth or fifth day. The inſide of the mouth was full of pimples, which would have prevented the ſheep's eating even if it had not had a diſguſt to food. The breath was exceſſively ſtinking. M. Borel obſerves, that when a flock of ſheep was ſeized with this diſtemper, at leaſt one half or two-thirds of them was very ſick. In moſt places, no attempt had been made to cure it, the country people being perſuaded that there was no cure for it, becauſe they had never ſeen their fathers adminiſter any; only ſome of them aſſured him, that the open air was better for the ſick ſheep, than houſing them.

This gentleman, not contented with examining

the ſymptoms of the diſeaſe in the living, endeavoured to diſcover its effects in the dead bodies. A ſheep which was firſt obſerved to be ſick on a Thurſday, continued in the field all Friday, and on Saturday morning was found dead in the ſheep-fold: it was brought to M. Borel in the afternoon of the ſame day; ſigns of putrefaction appeared already in it by an offenſive ſmell, by a livid, greeniſh colour upon its neck, and under its fore and hind legs, and by the largeneſs of its lower belly, which incloſed a great deal of infected air. This ſheep had not any pimples on the head, nor was that part of it at all ſwelled; only two pimples were found on the upper, and two on the lower part of the tongue; and in thoſe places the ſkin peeled off as it does from a tongue put into boiling water. On raiſing the eye-lids, it was ſeen that the eyes had loſt their brightneſs and tranſparency, and that more in one than the other. The pimples were numerous on the belly, under the fore and hind legs, and on the neck and throat. They appeared like tumours, or white puſtules, round, flat, and of a ſixth, a fourth, or a third part of an inch in diameter. They did not pierce deeper than the ſkin, and moved with it. The matter of which they were formed, had not yet made pits, as in the white puſtules of the ſmall-pox. On opening them, they appeared like a pinguous tumour; ſome were excoriated in the middle. It was preſumed that they had not become white till after the death of the creature, and that they were red before, as in the other ſheep during the firſt days of the eruption. The remains of a ſanious humour, of the colour of coffee, were found in the noſtrils; but no judgment could be formed of its mucoſity at the end of twelve or eighteen hours after death, when a putrefaction had begun. The lower belly being opened, the cawl appeared of a dead, blackiſh

red, and the fat of it had not that coheſian and conſiſtence which it has in ſheep killed when in health. The liver was of a dark green colour; which colour penetrated about a twelfth part into the ſubſtance of it, in ſome places more, in ſome leſs, and the part ſo coloured was brittle, as if boiled. The gall-bladder was flabby, and ſeemed to have contained more bile, and that thinner, than in its natural ſtate. The inner coat of the firſt ſtomach was looſe and wrinkled, of a green colour, and prodigiouſly full of white lenticular puſtules, of the ſame nature as thoſe on the ſkin, but ſmaller in diameter. The ſtomach contained a greeniſh liquor in ſmall quantity. The ſecond ſtomach contained alſo but little. The third was very full of food pretty well chewed, and as green as the graſs of which it was the produce. It was alſo much extended with a very rarefied and fœtid air. The ſmall guts were almoſt empty. In the colon and cæcum were excrements of a middling conſiſtence. The kidneys were like the liver, green and dry on the outſide. The bladder had little urine in it. The lungs were flabby, and of a dark, livid red. Some ſmall tumours were obſerved in them, like thoſe on the ſkin, but round and thick. The heart appeared larger than in its natural ſtate. The right ventricle contained a very black blood: a clod of blood taken out of the inferior vena cava was black in its upper part next the heart; but in its lower part next the liver it was yellow, and reſembled that coat which covers the blood in pleuriſies. The head of this ſheep was not opened, as well on account of the putrefaction, as becauſe the diſeaſe did not ſeem to have fallen on that part. M. Borel adds, that if a child had died at the ſame period of a diſeaſe, and with the ſame ſymptoms, it would be thought to have died of the ſmall-pox ſtriken in. The reſemblance between the *claveau*

in ſheep, and the ſmall-pox in men is very ſtriking, whether we examine it in its beginning and progreſs, or in its effects and conſequences in the ſheep that were cured. In many of theſe the ſkin of the head, eſpecially about the lips, was ſcamed as the ſkin of a human face is by the confluent ſmall-pox.

It were to have been wiſhed that M. Borel's occupations had permitted him to notice with the ſame care and exactneſs the effects of ſome medicines, which were pointed out to him at the time by one of the members of the Royal Society at Paris, and to purſue the experiments then propoſed to him. The queſtions which that ſociety put to him may, however, help to direct others on a ſimilar occaſion; and I ſhall therefore tranſcribe them here.

1ſt. Are old ſheep more ſubject to the *claveau* than young ones? Is the *claveau* apter to be of the confluent or malignat kind, and conſequently more dangerous in the former than in the latter? M. Borel anſwered, that no difference had yet been obſerved between the old ſheep and the young, with regard to the height to which the malignity or other ſymptoms aroſe. The ſociety, however, wiſh that this important point may be aſcertained by more accurate obſervations.

2d. Are the lambs ſubject to this diſorder? Is the diſtinct or mild kind the moſt common amongſt them? Are they ſubject to a looſeneſs in either kind of this diſtemper? Have they the diſcharge by the noſe in the confluent kind? Does this diſcharge precede, or does it accompany the eruption?

3d. At what time preciſely does the eruption appear, and how long alſo does it laſt, in the one and in the other kind of this diſeaſe? Does it vary according to the kinds of the diſeaſe, and according to the age of the animal?

4th. After the eruption, are the ſymptoms leſſened in the diſtinct kind? Do they become more alarming and ſeem to increaſe in the confluent kind?

5th. Is a ſheep which has recovered of either the one or the other kind of this diſtemper, ever attacked with it a ſecond time, or oftener?—The country people aſſured M. Borel, that they never knew a ſheep attacked a ſecond time by it.

6th. Could not inoculation be tried on a ſound ſheep, or on an uninfected lamb, which has been prepared before-hand? What would be the iſſue of ſuch an experiment, made with all poſſible precaution to guard againſt the ſpreading of the contagion?

7th. If a ſheep cured of the *claveau* in the natural way is inoculated, will it be infected?

8th. What would be the conſequence of inſerting ſome of the variolous matter into an aſs, a mule, a horſe, a bullock, a dog, or, in ſhort, into any animal of a different kind? What would be the effects of inoculating a ſheep, or other animal, with the variolous matter taken from the human body?

9th. Prepare ſome ſheep as for inoculation, and expoſe them afterwards to be infected in the natural way? will they be infected, and of what kind will the infection be?

10th. Inoculation not having had any effect, expoſe the ſheep to the *claveau* in the natural way, will they be infected?

Plenciz, a celebrated phyſician at Vienna, in a treatiſe on contagious diſeaſes, printed by Trattner, in 1762, has taken into conſideration, in p. 142, &c. the havock made by the diſtemper among cattle for thirty years paſt, in almoſt every country in Europe. He aſcribes the cauſe of it to ſmall worms, and founds his opinion on what he ob-

ſerved by the help of a microſcope in the ſeveral ulcers which extended from the mouth and throat to the ſtomach and lungs of the diſtempered animals. He cites the teſtimony of Rodius, *Cent.* 3, *Obſervat.* 61, & 62. that of Bidloo, and that of Bono in his letters to Valiſnieri.

The progreſs of this cruel diſeaſe having been ſuch towards the end of the year 1761, that the ſymptoms of it became daily more and more ſevere, this zealous author determined to ſearch firſt into the cauſe of its ſpreading ſo rapidly, and next into the means of getting the better of it. Theſe two points are the ſubject of a ſmall work ſerving as a ſupplement to that we have been ſpeaking of, viz. *Additamentum ad Tractatum de contagione*, p. 142, 143, 144, *&c. ſeu de lue bovina ad finem vergente anno* 1761, *epidemia graſſante, &c.*

Michael Sagar, phyſician in the circle of Iglaw, in Moravia, has given us the hiſtory of a diſtemper which reigned among the cattle in 1764. It was printed in 1765, by Kraus, at Vienna, under the title of, *Libellus de apthis pecorinis anni* 1764, *cum appendice de morbis pecorum in hac provincia tam frequentibus, eorundemque cauſis et medelis preſervatoriis.*

Theſe two works contain excellent obſervations, and caſt a great light on the ſubject; as does alſo the work of M. Ens, intitled, *Diſquiſitio Anatomico pathologica de Morbo Boum Oſtervicenſium.*

We find in the ſecond volume of Sydenham's works printed at Geneva in 1736, by the brothers Detourne, not only all that Bernard Ramazzini has ſaid of the conſtitutional epidemics of 1690, 1691, 1692, 1693, and 1694, but likewiſe a collection of what Schroeck, Harder, Valentinus, Garhliep, Behrens, Rayger, Steggmann, Schelhamer, Hoyer, Gerbezius, &c. have written on the epidemical conſtitutions of different countries at different times. They have all been ſufficiently attentive, whenever the contagion extended to any

kind of cattle, not to neglect this circumſtance, though it was not, ſo much as might have been wiſhed, the principal object of their writing. We are, however, obliged to phyſicians, who, whilſt they ſearch into the cauſes of deſeaſes fatal to men, at the ſame time caſt an eye on thoſe of cattle. *Sunt enim animalia poſt hominem, ita ars veterinaria poſt medicinam ſecunda eſt.* Veget.

Of the Cauſes of the contagious Diſeaſes of Cattle.

THE conſtitution of the air, and the quality of their food, are the original cauſes of all the epidemic diſeaſes of cattle. They breathe the ſame air as we do, and conſequently muſt be affected by its various temperature, its changes, its gravity, its lightneſs, its greater or leſs elaſticity. The vapours, the exhalations, and whatever it carries with it muſt make on them at leaſt as much impreſſion as on us, and even more, ſince, not being cloathed, as we are, they are more expoſed to the immediate contact of the air; ſo that what is contained in the atmoſphere finds an eaſy admiſſion by the mouth and noſe, and being lodged in their hair, may inſinuate itſelf into the body, and ſo occaſion many diſorders.

It appears that whatever in the air is hurtful to animals, affects them chiefly by the mouth and noſe: for theſe effects generally ſhow themſelves firſt in the head or ſtomach, and frequently in both at once. Hoffman is clearly of opinion that morbific ferments are mixed with the blood by means of the ſaliva, more than by any other means. That liquor, whether it be ſwallowed conſtantly, or only when it accompanies the food, carries the ferment with it into the ſtomach and inteſtines, where, mixing with liquors eaſily ſuſceptible of putrefaction, or of being affected by any particular

ferment, the liquors are in this depraved ſtate carried with the chyle into the body, and produce effects ſimilar to their different qualities, either on the body in general, as in a fever, or on ſome particular part: whereas if the venom entered by the pores, it would meet with liquors in continual motion, and therefore not ſo ſuſceptible of putrefaction, or of being affected by any peculiar ferment.

That the air is the great ſource of contagious diſtempers, was an opinion of the moſt ancient writers. Hippocrates (*Sect.* 4. *de Flatibus*) looks upon the air as the ſource of all diſorders. Virgil (*Geor. Lib.* 3.) promiſes to teach us the cauſes of all the diſeaſes of cattle; *Morborum quoque te cauſas et ſigna docebo.*

" The cauſes and the ſigns ſhall next be told,
" Of ev'ry ſickneſs that infects the fold."

Yet he mentions only the air, as if that was the ſole cauſe.

Hic quondam morbo cœli miſeranda coorta eſt,
Tempeſtas, totoque autumni incanduit æſtu,
Et genus omne neci pecudum dedit, omne ferarum,
Corrupitque lacus, infecit pabula tabo.

" Here from the vicious air, and ſickly ſkies,
" A plague did on the dumb creation riſe:
" During th' autumnal heats th' infection grew,
" Tame cattle and the beaſts of nature ſlew;
" Pois'ning the ſtanding lakes, and pools impure:
" Nor was the foodful graſs in fields ſecure."

Livy too (*Lib. V. Decad.* 1.) ſeems to impute to the air a peſtilential diſeaſe which carried off both men and animals in his time.*

Though the air is unqueſtionably a moſt powerful agent in communicating contagious diſeaſes, yet

* *Tryſtem hyemen ſive ex intemperie cœli raptim mutatione in contrarium factâ, ſive aliâ de cauſâ gravis peſtilenſque omnibus animalibus æſtus excipit.*

it is not the only one; for if it were, how comes it that the peſtilential diſeaſes which at different times have deſtroyed mankind, have ſpared the beaſts of the field? Thucydides, in his deſcription of the plague of Athens (*de Bell. Peloponn. Lib.* 2.) does not ſay that it extended to beaſts: he only relates, that the carnivorous animals would not touch the bodies of thoſe which died of the plague, and that thoſe which were ſo voracious as to eat of them died; which is a tacit proof that the other animals did not die of it. The plague ravaged the Roman Empire during fifteen years under the Emperors Gallus and Voluſian (*Zonar. tom.* 2.) in the year 263, it killed five thouſand people in one day in Rome only (*Baronius, Annal. tom.* 2.) Under the Emperor Juſtinian, there died of the plague at Conſtantinople, from five thouſand to ten thouſand people likewiſe in one day (*Procop. de Bello Pers. Lib.* 2.) Guy de Chauliac ſpeaks of a plague which appeared in his time, viz. in 1348, ſo extremely ſevere, that it ſwept away three-fourths of mankind from off the face of the earth. According to Rondelet, it made dreadful havock in France, Germany, Italy, and Spain, in 1450. Valeriola ſays that, in 1553, men dropt down dead of the plague in Narboneſe Gaul, whilſt they were talking together or walking, as if they had been ſtruck with thunder. Jerom Mercurialis relates the ſame thing of that which appeared at the ſame time at Padua and at Venice. Zacutus ſpeaks of a moſt dreadful plague which happened at Liſbon in 1601. In fine, it appeared in Moſcovy in 1655, in England in 1665 and 1666, in Poland in 1708 and 1709, at Marſeilles in 1720; and yet the authors who have ſpoken of theſe terrible ſcourges make no mention of their having affected any other creatures than mankind. Can it be ſuppoſed that all of them neglected or forgot a circumſtance of ſo great conſequence? Their ſilence is a convincing proof that all epide-

mical diſeaſes do not ariſe ſolely from the conſtitution of the air.

It may be objected, that as the air acts differently on different bodies, ſo the diſeaſes which the air communicates to men may not affect other animals, nor thoſe which are peculiar to any one ſpecies of animals affect any other ſpecies: for what proves mortal to one ſpecies does not to another; and that there is a plague for men, another for horſes, another for cattle, and another for ſheep. A ſound bullock put into the ſame ſtable with a glandered horſe, does not catch the glanders. A bullock put into a houſe with ſheep ill of the ſmall-pox, does not catch that diſeaſe, nor do horſes; and ſound ſheep do not catch the glanders or farcy from horſes, when confined with them in the ſame ſtable: and yet one ſhould be cautious not to mix ſound animals of any ſpecies with diſeaſed ones of any other: for men who had not ſo much as a ſcratch on their hands have been ſeized with a true anthrax by opening the bodies of cattle dead of a contagious diſtemper; and almoſt all the cow-herds who were appointed to watch an infected herd, have been ſeen to fall into malignant fevers accompanied with a gangrene.

Independant of the air, it is certain that many epidemic diſeaſes take their riſe from the bad qualities of food. If the bread-corn is any way diſtempered, it never fails to bring on diſorders among the country-people; of which a remarkable inſtance is recorded in the Hiſtory of the Royal Academy of Sciences for the year 1710; viz. that the peaſants of Sologne, who lived on rye which had the ſpur, were ſeized with a dry black gangrene, which began in the toes, aſcended inſenſibly, and made their limbs drop off, in ſuch manner that ſome of them were alive in the Hotel-Dieu at Orleans, with nothing left but the trunk of the body. Graſs

equally diſtempered becomes equally pernicious to the cattle which are fed with it. The diſtemper in graſs called ruſt (*ærugo & rubigo,*) has always been looked upon as very dangerous. The Holy Scriptures ſpeak of it as an effect of the wrath of God. Pliny reckons it more hurtful than hail; and therefore it was, ſays he, that Numa Pompilius inſtituted feſtivals, called *Rubigalia Feſta*, to avert the effects of it. They were celebrated in the month of April, becauſe this diſtemper uſually begun in that month. The nature of it is not yet well underſtood. It generally begins when, in hot weather, there has fallen a plentiful dew, which was ſuppoſed to break the veſſels of the leaves and ſtems of plants, from whence iſſued a thick, extravaſated juice, which being dried by the ſun, was turned into a red powder which adhered to the plants, and did them great injury; for they ſoon after appeared gangrened, if we may apply this word to plants. Count Franceſco Ginnani, in his work intitled *Delle Mallatie del Grano in Herba, C. 5. Part. II.* attributes this diſtemper in vegetables, not to the extravaſation of the juices, but to the hatching the eggs of inſects. He has ſeen them, he ſays, between the outward and the inward covering of the leaves. Plenciz, in the work beforementioned, quotes the microſcopical diſcoveries of Needham, the Obſervations of Mercurialis, and the Acta Eruditorem of Leipſick for the year 1718, in order to demonſtrate that what is properly called the *Ruſt*, depends on the eggs of certain vermin, which being laid on vegetables, penetrate the outer ſkin, hatch, and afterwards multiply there. Calm and temperate weather, rather warm, and in which there are dripping rains without a cloudy ſky, favours their production. This, ſays he, is what was experienced in Auſtria in the year 1751, and what was obſerved on the 31ſt of March and 30th

of June, 1759, on both which days it did not ceaſe to rain, though the ſky was clear. In the former of theſe caſes, almoſt all the vegetables in the country were covered with ruſt; and in 1759 the wheat was greatly damaged by it. This opinion of the cauſe of this diſtemper is adapted by M. Tillet, by Loewenhoeck in his 109th letter to Van Leeween, and by M. Duhamel. Whatever be the caſe as to this opinion, all agree that damaged or corrupted food muſt be as hurtful to other animals as to men. Clover, ſainfoin, and lucerne are certainly wholeſome plants; but let them be attacked with this diſtemper, they become as hurtful as the crowfoot, (ranunculus) tithymal, (ſpurge) or hellebore; and theſe too, dangerous in themſelves, become more ſo when thus affected. This ruſt, ſays Ramazzini in his Obſervations on the Epidemic Diſtemper at Modena, ſeems as corroſive as ſpirit of nitre. The paſtures corrupted by it were ſo fatal to cattle, that whole herds were carried off. In 1693, the graſs was infected by it in Heſſe, and accordingly, ſays Bernard Valentine, the cattle died there by whole droves. The ſame happened in Carniola in 1712, and in the Ferrareſe in 1715; and the ſame conſequences enſued. Rye which has the ſpur, is not only fatal to men, but occaſions internal and external ulcers in hogs and geeſe.

In the months of July and Auguſt, 1756, there was a mortality among the cattle in Minorca, which having been tranſported thither, could not bear the heat of the climate, as was mentioned before. The herdſmen who attended them fell ſick; but the diſeaſe was much more ſevere in thoſe who had been ſo imprudent as to eat of the fleſh of the ſick cattle; for all of them were ſeized with a malignant fever, accompanied with a gangrene which ſhowed itſelf on the ſecond day, eſpecially at the elbow and heel.

The ruſt is to graſs, what a corrupted ſtate is to fleſh: if fleſh in this ſtate occaſions fevers amongſt men, why ſhould not vitiated plants have a ſimilar effect on cattle? Independent of this, there are plants which are in themſelves prejudicial to cattle. We ſee them frequently die in marſhy ground, whilſt thoſe fed on the neighbouring heights are healthy. In our paſtures, hurtful plants grow among the good, and the care of ſelecting the latter is left to the cattle. It is true that the Creator has indued them with an inſtinct to diſtinguiſh the hurtful from the good; but the former often grow ſo cloſe to the latter, that it is almoſt impoſſible for them to crop the one without eating of the other. We ſee the crow-foot growing every where: all the ſpecies of it contain an acrid juice, eſpecially the parſley-leafed marſh crow-foot, *ranunculus paluſtris apii folio*, otherwiſe called *herba ſcelerata*, a name which ſufficiently indicates its noxious quality. This grows by the ſides of rivers, and is indeed not ſo often met with as the acrid upright meadow crow-foot, *ranunculus pratenſis erectus acris foliis*, and the creeping, hairy meadow crow-foot, *ranunculus pratenſis repens hirſutus*, which are very common in our meadows, and though leſs dangerous to cattle, yet are injurious to ſuch as eat them. The *ptarmica vulgaris*, *dracunculis pratenſis*, which ſome likewiſe call the ſneezing-plant, is not leſs common nor leſs acrid than the *ranunculus*. We alſo find in them the ſpurge, *(tithymalus)* a very acrid plant, and the ſmall kind of hemlock, which ought to be baniſhed from them. A careful obſerver will remark other plants perhaps equally prejudical; and the huſbandman who ſuffers ſuch plants to grow in his paſtures is inexcuſable: for when one or two of the creatures fed on them become ſick, the diſeaſe ſoon communicates itſelf to many, already pre-diſpoſed, by the effects

of their food, to receive the infection; and thus it is inſenſibly ſpread.

Water, which ſhould be accounted an aliment, may, by bad qualities communicated to it, contribute greatly to the production of epidemic diſeaſes; and ſtill more ſo, when aſſiſted by diſtempered or acrid food.

We read in the philoſophical tranſactions, that, during the plague in London, there was collected from off the ſurface of water, expoſed in a veſſel to the air, a blue pellicle, which having been mixed with bread, and given to a dog, killed him in twenty-four hours. But without being infected by theſe peſtilential particles which drop upon it from the atmoſphere in a peſtilential conſtitution of the air, the water may be charged with other ſubſtances pernicious to animals, taken up whilſt paſſing through mines of lead, copper, &c. It ſometimes carries with it gypſous matters and ſelenites, which may form concretes or obſtructions, and cauſe many diſeaſes. The waters in Minorca are of this kind: having too ſhort a run to drop the earthy particles with which they are loaded, they conſtantly form ſtrong concretions adhering to the ſides of the veſſels in which they are contained. Standing, heavy, ſlimy water, loaded with many inſects and their eggs, as well as with many particles from the animals and vegetables which die and rot in them, is the cauſe of many diſeaſes to cattle which are often obliged to drink of it. Water is both the moſt univerſal diſſolvent, and the apteſt vehicle for carrying noxious particles into the blood.

Standing putrid water is not more pernicious by reaſon of its viſcidity, than it perhaps is on account of vaſt numbers of ſmall worms which are ſwallowed along with it, and live and grow in the ſto-

machs of cattle; as do alſo their young brood. Theſe by their motion irritate, and by pricking inflame the ſtomach and inteſtines, from whence proceed ſpaſms and convulſions, ſomewhat ſimilar to what ariſes from the uſe of acrid or diſtempered food: for theſe too irritate the ſtomach and inteſtines; and the ill effect that will follow is an acceleration of the periſtaltic motion of the inteſtines; whence more frequent diſcharges, and even bloody flux. The acrimony, being ſometimes ſo ſtrong as to erode the coats of the ſtomach and inteſtines, occaſions inflammations and intolerable pain, convulſions, &c. and the inſpection of the dead bodies ſhows us, that in contagious diſeaſes, the ſtomach has been inflamed, and that the internal coats, by the livid ſpots in them, which are ſometimes continued down the whole length of the inteſtines, had a tendency to a mortification or gangrene.

Of the Cure of the contagious Diſeaſes of Cattle.

IT has been already ſaid, that the conſtitution of the air is one of the general cauſes of contagious diſeaſes among cattle. M. Le Clerc, treating of the epidemic diſeaſes which deſolated Ruſſia, lays down the following rules for judging of the nature of contagious diſeaſes, and of the method by which they may moſt probably be cured. "An unex-
"pected diſtemper," ſays he, ſuppoſing the caſe,
"breaks out at once with alarming ſymptoms and
"terrible effects, and communicates itſelf from
"creature to creature. The effects of this diſ-
"temper, howſoever complicated they may be,

" teach me the time, the order, and the means of
" correcting an evil ariſing from a cauſe unknown.
" Nature alſo ſhows me, by the criſis ſhe brings
" on, the manner in which the diſorder ſhould be
" expelled. Moreover, I attentively conſider the
" qualities of the air we breathe, the ſituation of
" the place, the qualities of the ſoil, the kind of
" life which the inhabitants lead, the diſorders
" which at the ſame time affect cattle or plants,
" the neighbourhood of mines, marſhes, ſtanding
" water; and if I do not trace the cauſe in any of
" theſe, I look back, and ſearch for it in things
" already paſt. I reflect on the ſeaſons anterior to
" the diſorders: I examine the time, the courſe,
" the duration, the anticipation, the changes, the
" temperature, and finally the mixt or extraor-
" dinary qualities of the ſeaſons, and the winds
" which have been moſt frequent during that time.
" I then reflect on the nature of the diſeaſes which
" theſe variations have given riſe to; nor do I
" loſe ſight of the changes theſe diſeaſes have un-
" dergone. If in my reſearches I at length find
" one or more cauſes capable of producing the diſ-
" order which I was unacquainted with, I com-
" pare the effects of the diſtemper with the power
" of the cauſe, and then draw my concluſion from
" their reſemblance, or analogy. Have ſoutherly
" winds reigned long? I anſwer, that theſe winds
" are naturally peſtilential: they may therefore
" produce peſtilential fevers. Do the mixed or
" extraordinary qualities of the ſeaſons, their heat
" and moiſture united, occaſion the diſtemper?
" The effects, being truly diſcovered, make known
" the ſtate of the fluids and ſolids during, and
" even after, ſuch a conſtitution of the air. The
" diſorder being known, (as far as our limited
" knowledge can reach) I form my indication of
" cure. I guard the infected body againſt the

" effect of the preſent venom, by giving of choice, " ſuch medicines as have been employed with the " greateſt ſucceſs in ſuch diſeaſes as have been par- " ticularly marked by ſimilar effects. Theſe are " the means of coming at the knowledge of ve- " nom; a knowledge which is not otherwiſe ſuffi- " ciently manifeſted to our ſenſes. Does the in- " temperature of a ſeaſon give me room to think " that it is the efficient cauſe of any diſorder? I " have immediate recourſe to the hydroſcope and " engyſcope. The firſt informs of the real ſtate of " the air; the ſecond gives me an inſight into the " nature of the particular ſalts then diffuſed in the " atmoſphere (*a*). I then expoſe to the air every " ſubſtance which the ſalts of the air can alter, as " ſilks died of ſuch particular colours as are tar- " niſhed by the nitrous or ſulpherous acid, and " are turned black by the vitriolic acid. I more- " over obſerve the alterations which the vapours " of dew have produced on white linen before it " has been waſhed with ley or ſoap."

In all the cattle which have died of contagious diſeaſes, and have been opened, there have been evident marks of inflammation and putrefaction. Theſe diſtempers may therefore be reduced to the putrid and the inflammatory kinds. Putrid diſeaſes differ among themſelves, as do likewiſe the inflammatory: but that difference conſiſts only in the greater or leſs degree. The epidemic diſtemper of 1690 ſhowed itſelf with puſtules. Whenever eruptions appear on the ſkin, it is a certain proof that the cutaneous veſſels are obſtructed with a matter that cannot circulate in ſo minute veſſels, and therefore an inflammation ariſes. In almoſt every creature that was opened in 1693, there was

(*a*) The curious may likewiſe conſult on this ſubject, *Les Experiences Phys. de Poliniere*, Tom. II. p. 306, *& ſeq.*

found in the lungs a ſuppuration, which muſt have been preceded by an inflammation. The diſtemper which proved ſo fatal to the cattle in Lower Hungary in the year 1712, appeared with puſtules which contained an extremely fœtid matter. The ſtench of that matter, and of the humour which flowed from the mouth and noſe, proved that a putrefaction was joined to the inflammation in that diſeaſe. The author who has deſcribed the epidemical conſtitution at Augſburgh, declares the diſtemper of the cattle was putrid and inflammatory. In the contagious diſtemper which prevailed in 1740 and the following years, the fever appeared to be inflammatory, malignant and putrid. The contents of the firſt ſtomach were very putrid, and the air which proceeded from it was extremely fœtid: thoſe of the ſecond looked as if they had been dried: its membranes were black, gangrened, and eaſily torn to pieces; as were alſo the membranes of the third ſtomach and of the inteſtines, which likewiſe contained ſometimes purulent matter. Black ſpots and hydatides were obſerved on the liver, the lungs, and on the meninges of the brain. In the cattle which were opened in Minorca in 1756, traces of inflammation, terminating in mortification, were obſerved in almoſt all the bowels. The appearance of the ſheep which died of the ſmall-pox in the neighbourhood of Beauvais, likewiſe confirms that the diſorder was highly inflammatory and putrid.

As it has conſtantly appeared upon opening the bodies of cattle which died of contagious diſtempers, that the diſeaſes were either inflammatory or putrid, the method in which theſe diſorders ſhould be treated is hereby pointed out. When they are inflammatory, the firſt intention ſhould be to cool the too-great heat of the blood, to leſſen its rare-

faction, the velocity and force of its motion, in order to take off or leſſen the obſtructions in the capillary veſſels. Theſe purpoſes are anſwered by plentiful bleedings, by ſo much the more neceſſary in cattle, as the action of their veſſels is ſtronger than in men. The heat and ſtrong action of the veſſels ſoon diſſipate the thinneſt watery part of the blood, whence farther obſtructions enſue; and hence it is that inflammatory diſeaſes are moſt dangerous in the moſt healthy conſtitutions, and in the moſt robuſt animals. Evacuations become therefore the more neceſſary, leſt ſuppurations or mortifications ſhould be the conſequence. Plenty of cooling and diluting liquors ſhould be given at the ſame time.

If, on the contrary, ſigns of putrefaction appear, the firſt paſſages ſhould be immediately cleared of whatever putrid ſubſtance they contain, or of any ſubſtances that may become ſo; for if they were to remain there, they would communicate their putrid taint to the blood. This end is obtained by glyſters and purging medicines. The firſt paſſages being thus cleared, digeſtion is better performed, and room is made for antiſeptic medicines, which may deſtroy the remaining infectious venom.

Comparative anatomy teaches us, that the ſtructure of other animals differs but little from ours. The animal and vital functions are the ſame; the ſecretions are made in the ſame manner. Why then ſhould not the ſame medicines be uſed in their diſorders as are uſed in ours?

In caſe a contagious epidemic diſtemper amongſt cattle is attended with a cutaneous eruption, it will be firſt of all neceſſary to examine what kind of eruption it is: for cutaneous eruptions proceed ſometimes from the violence of the fever, from acrid and ſtimulating ſubſtances taken down into the ſtomach, or from medicines of too warm and

cordial a nature. In this caſe, no good is to be expected from the eruption. But ſometimes it is an effort of nature to relieve herſelf by throwing the peccant matter out upon the ſkin, and in this caſe the eruption is favourable, and ſhould be encouraged.

In the firſt caſe, the fever is high, the heat conſiderable, and all the ſigns of inflammation appear. Recourſe muſt therefore be immediately had to bleeding, and to cooling and diluting liquors, ſuch as water in which ſalt-petre or ſal-prunel has been diſſolved; an ounce in about fifteen pounds (or pints) of water. In lieu of ſalt-petre, vinegar or ſpirit of vitriol may be mixed with water in quantity ſufficient to give it a grateful acidity. The food ſhould be light; ſuch as freſh graſs or other plants, and bran boiled in water. By theſe means the progreſs of the inflammation may be ſtopped, or a reſolution may be obtained of the veſſels already obſtructed.

In the latter caſe, the above method muſt be avoided: evacuations might ſtrike in the eruption, and thereby prove mortal. The eruption muſt, on the contrary, be encouraged, by giving an ounce of theriac to a bullock or a horſe. The eruption will likewiſe be kept up by giving them daily a ſpoonful of the flower of ſulphur with bran. Their drink ſhould be water in which ſea-ſalt has been diſſolved. That ſalt is a diuretic which helps to depurate the blood by urine. The depuration ſhould be aided by a ſeton made in the dew-lap of a bullock, by piercing it through with a biſtory, and drawing through the inciſion a rag of linen or a ſkein of thread, daubed with baſilicon. Care muſt be taken to draw the rag or ſkein through the wound daily, ſo as to leave a freſh piece of it in the inciſion, in order to keep it clean. If, notwithſtanding theſe means, the eruption does not keep

out, the doſe of theriac muſt be repeated, and a decoction of ſarſaparilla and ſaſſafras, or of contrayerva, muſt be given for drink.

The contagious diſtemper which appeared in Heſſe in 1693, terminated in a pulmonary phthiſis, which might have been prevented, or rendered milder, by bleeding in the beginning, and by cooling and nitrous or acidulated drinks. If it could not be entirely prevented, it might have been very proper to have given to the ſick animals half an ounce of ſulphur, and the ſame quantity of cinnabar of antimony mixed with bran; at the ſame time rubbing them heartily and often, in order to determine to the pores of the ſkin the matter which would have produced an abſceſs in the lungs. When the ſmall-pox does not ſuppurate kindly, the diſeaſe often falls on the lungs; and by the rule of contraries, a cutaneous eruption, a determination of the humours towards the ſkin, often draws the humour from the lungs, and is frequently ſeen. An ulcer, an iſſue, make drains which often relieve the lungs. The phthiſis might therefore have been thus prevented, ſeeing it proceeded from the ſame cauſe which three years before brought on the ſmall-pox. This is making nature our guide.

The contagious diſtemper which reigned in France and over all Europe from 1740 to 1750, and which had appeared before in Hungary, Germany, and Italy in 1711 and 1712, ſhowed itſelf with evident ſymptoms of an inflammatory, malignant, putrid fever. As the throat, ſtomach, and inteſtines were greatly irritated by an extremely acrid humour, the firſt care, in ſuch a caſe, ſhould be to allay the acrimony by mild drinks which reſiſt putrefaction, and to prevent the inflammation it may cauſe, by bleeding. With this view, a glaſs of oil of olives, or of linſeed oil, with half as much vinegar, ſhould be given morning and evening, in a pint of warm

water. During the two firſt days, a decoction of ſorrel rendered gratefully acid with vinegar, or ſpirit of vitriol, ſhould be given, and for food only bran boiled in water, in order to give time to the ſtomachs to free themſelves of the food lodged in them, as was before obſerved; after which it will be right to give them an ounce of crocus metallorum in powder, or, which is yet better, the ounce of crocus may be infuſed for twenty-four hours in a quart of white wine, and the whole be given at once through a horn. A quart is the doſe for horſes, bullocks, and cows, and half a pint for ſheep. The creatures which take this remedy ſhould be kept all the day warm in a ſtable, and not be ſuffered to eat till the evening; the effect of this medicine being as much by the ſkin as by purging. The efficacy of this medicine has been often experienced; yet the violence of the diſtemper requires that we do not ſtop here. The ſeton before recommended is here of the greateſt utility. If people in the country cannot procure the crocus metallorum, they may ſubſtitute in its place two ounces of dry briony roots, or one ounce and a half of thoſe of aſarabacca. The crocus metallorum is however by much the beſt. In order to cauſe a freer diſcharge from the mouth and noſe, powder of hellebore, or of horſe-cheſnut, may be blown up the noſe, and the mouth may be waſhed with a mixture of vinegar and theriac: or if the noſe is dry, it may be proper to throw up into it, with a ſyringe, ſome barley-water and honey; and if a ſtimulant is wanted, ſome flower of muſtard may be added.

If, notwithſtanding this treatment, the ſymptoms do not abate, recourſe muſt be had to the Peruvian bark, half an ounce of which, mixed with two drams of ſal-prunel and twenty grains of camphire, ſhould be given night and morning. Theſe

medicines are powerful preſervatives from putrefaction, eſpecially the bark, the virtue of which in gangrenes is well known. Country people, who cannot afford the expence of theſe medicines, may ſubſtitute in their place half an ounce of gentian-root with half an ounce of kitchen-ſoot, this abounding moſt in ſal-ammoniac. The ſal-prunel and camphire, may be added to them, becauſe theſe medicines powerfully promote the ſecretions by the ſkin and kidnies. Inſtead of the theriacated vinegar, one may uſe ſtrong vinegar, in which a handful of ſalt has been diſſolved, and a few heads of garlic bruiſed. It is proper to obſerve that, if the animal has not been bled in the beginning of the diſorder, bleeding ſhould not be attempted now; for it will do much hurt.

When hard tumours or buboes appear on the breaſt, or groin, as happened in the contagious diſtemper in Germany which ſucceeded to that in Hungary, cupping-glaſſes are thought to be of great uſe, to draw the humours the more to theſe parts. They ſhould be ſcarrified, and brought to ſuppuration as ſoon as poſſible by applying warm ointments and poultices; and to determine the remaining peccant matter to the pores of the ſkin, half an ounce of ſoot ſhould alſo be given daily in a glaſs of theriacated vinegar. A bubo in the glands about the throat and neck has often proved a happy criſis, and carried off peſtilential fevers. The theriacated vinegar conſiſts of two ounces of theriac diſſolved in a quart of common ſtrong vinegar. The ſtrongeſt is the beſt.

If a red bliſter, turning black at the bottom, is perceived on the tongue of an animal, ſuch as was obſerved in the years 1731 and 1765, that bliſter is much to be feared. It is a peſtilential puſtule which may carry the creature off in twenty-four hours; and therefore the cure muſt be very ſpeedy.

The whole of this bliſter ſhould be immediately cut out and carefully ſeparated from the live fleſh. The ſkin and every part which appears black ſhould be taken away, and the wound be afterwards waſhed three times a-day, at leaſt, with ſtrong vinegar in which ſome ſalt has been diſſolved; and this ſhould be continued till the wound is cicatriſed.

The Royal Society of Agriculture at Paris have publiſhed the following method, which was found ſucceſsful in the generality of Moulins, where it was tried on three hundred and thirty horned cattle, all of which were cured.

" The firſt care was to adminiſter preſervatives to the ſound cattle. To this end they were bled in the jugular, their mouths were waſhed frequently, acidulated nitrous drinks were given them, and their habitations were fumigated.

" The lotion was made of vinegar, pepper, ſalt, and aſſa-fœtida bruiſed. The whole was mixed together, and ſteeped, ſhaking it at different times. The tongue, and all the parts of the mouth and jaws, were then ſtrongly rubbed with this liquor. Every part of the tongue was in an eſpecial manner rubbed with a cloth wet in the liquor. Sometimes half an ounce of ſal-ammoniac was added to this lotion.

" The drink was barley-water, with an ounce of ſalt-petre, and vinegar enough to render it gratefully acid.

" The fumigation conſiſted either of vinegar thrown upon live coals in the ſtable or cow-houſe; or of four handsful of juniper-berries, two of wormwood, two of elecampane root, and two of leaves of ſabine, with an ounce of myrrh; the whole powdered and burnt on a chaſing-diſh.

" Likewiſe juniper-berries were ſteeped in vinegar, and a handful of them mixed with bran was given twice a-day.

" In places where the contagion had been extremely violent, the drink preſcribed conſiſted of two handfuls of rhue infuſed in a pint of red wine; to which were added a few cloves of garlic, ſome juniper-berries, and two drams of camphire. A hornful of this was given every morning to each creature faſting; and by the uſe of all theſe means, two hundred and twenty-five bullocks and cows were preſerved from all taint, though ſeveral of them had communication with the ſick animals.

" With regard to the treatment of theſe laſt, all bleeding was forbid; the fumigations were recommended; and as to the tumour which appeared on the tongue, it was thought better and ſurer to cut it entirely out with a biſtory or ſciſſars, than only to ſcrape and rub it. Scarifications were ordered to be made in the bottom and ſides of the ulcer, and the whole tongue was afterwards fomented five or ſix times a day with tincture of myrrh and aloes, or with ſpirit of wine in which ſal-ammoniac and camphire had been diſſolved in the proportion of half an ounce of each to eight ounces of the ſpirit. A waſh of theriacated vinegar, with ſome camphire added to it, is likewiſe very proper in this caſe; and it will not be at all amiſs to make the creature ſwallow a ſpoonful or two of it every time it is uſed: for it cannot be thought that a diſtemper, of which the effects are ſo rapid and ſevere, that the tongue of the animals may be cut aſunder by it and drop off in leſs than twenty-four hours, can be ſufficiently treated by external remedies only. The following alexiteric medicines are therefore adviſed to be given inwardly.

" Take roots of contrayerva and alecampane, of each three drams, a dry viper in powder, and one dram of camphire; mix them with a ſufficient

quantity of the extract of juniper, make them into a ball, and give it to the animal.

" Or, take of the root of ſwallow-wort, of maſter-wort, of alecampane, and of angelica, of each half an ounce; boil them in two pounds (or pints) of vinegar of roſes till one third of it is evaporated. Strain off the liquor, and then add to it one ounce of orvietan: then divide it into two doſes, and give one them in the morning faſting, and the other in the evening, taking care to cover the ſick creatures well whilſt they are taking the medicine. This done, there will be no need to fear returns of the diſorder, ſometimes by ſo much the more fatal, as it afterwards appears on other parts, and in a different form: as experience has ſhown. It is moreover neceſſary that the diſeaſed be perfectly cured, that both ſound and ſick be well curried, and that their mouths be examined ſeveral times a day to be aſſured of the ſituation the beaſt is in; for this gangrene does not ſhow itſelf by any other external ſign."

The ſmall-pox is, next to the plague, the moſt dangerous of all the contagious diſeaſes to which ſheep are liable. I ſhall here diſtinguiſh it only into the diſtinct and the confluent kinds. The diſtinct, or mild, ſtands very little in need of medicines: it may, and indeed ſhould, be left to nature. The confluent, on the other hand, requires the greateſt attention. Whatever the cauſe of this diſeaſe may be, look upon the expulſion of the matter, and the ſuppuration and drying of the puſtules, as the natural progreſs of it. There muſt then be an eruption: but ſometimes the eruption is imperfect, comes on with difficulty, or is even ſuppreſſed; and at other times is ſo great as to endanger the life of the animal. It therefore is plain that this diſeaſe ſhould not always be treated in the ſame manner; for ſometimes cordials may be requi-

ſite in order to ſupport a too feeble eruption, and cooling medicines may be neceſſary to check a too-high inflammatory fever. If therefore, the fever appears high, blood muſt be taken from the jugular, and this muſt be repeated, becauſe not above two or three ounces can be got from the jugular of a ſheep at one time. This operation was found to give great relief to the ſheep before ſpoken of at Beauvais. It ſometimes leſſens the number of pimples; but thoſe which remain become larger, and ſuppurate more kindly. Two drams of ſalt-petre mixed with honey are given every day to each ſick animal, and for drink warm water rendered gratefully acid with vinegar or ſpirit of vitriol; nor ſhould the ſeton be forgotten here. If the pimples are of a violet or purple colour, they indicate a gangrene, or at leaſt a diſpoſition towards it. In this caſe, a dram of Peruvian bark, half a dram of ſal-prunel, and eight grains of camphire, mixed up with honey, ſhould be given two or three times a-day. Some ſheep thus affected, and which had been given up as loſt, were recovered by the uſe of theſe medicines. They muſt be kept within doors, eſpecially in the winter.

If the ſheep are weak, and the eruption feeble, not only bleeding ſhould be avoided, but ſuch medicines ſhould be given as will incline the matter to the pores of the ſkin; ſuch, for example, as a dram of vipers in powder in a decoction of contrayerva-root. A bliſter may be put on the neck after clearing it intirely of wool. This bliſter ſhould be made of cantharides and a little vinegar mixed with leaven. It is commonly left on for a long while, becauſe the flies do not eaſily affect the ſkin of ſheep. One might even uſe from time to time a decoction of the ſudorific woods; for the

common drink of the ſheep in this condition ſhould be water in which ſea-ſalt has been diſſolved.

When the pimples appear again, the eruption is kept up by giving every day half an ounce of flower of brimſtone, with as much laurel-berries in powder, mixed with bran. This ſhould be continued till the pimples begin to ſuppurate; after which the ſulphur and laurel-berries ſhould be ſuppreſſed, but their drink ſhould ſtill continue to be water rendered diuretic by the mixture of ſea-ſalt. The diſcharge from the noſe ſhould be encouraged, by waſhing it with a decoction of tobacco, and blowing up the noſtrils hellebore and betony in powder: for though a great diſcharge from the noſe is a bad ſymptom, as it always indicates much putrefaction; yet a free diſcharge from thence is beneficial, juſt as a plentiful ſpitting is to mankind.

As ſoon as the pimples become dry, it is highly proper to purge the ſheep with half an ounce of aſſafœtida in powder, mixed with bran, to prevent a tranſlation of matter on the eyes or breaſt, which otherwiſe happens frequently.

In a village called Les Echerres, about three leagues from Lyons, one half of a flock of ſheep was ſeized with the ſmall-pox: the ſound half was immediately ſeparated from the infected; but though all communication between them was cut off, the diſeaſe broke out in ſome of thoſe which had been deemed ſound, and thoſe infected ones were returned back to the ſick. Endeavours were uſed to ward off the infection by properly fumigating the ſheep-cotes, and clearing them of every ordure or other thing that could communicate or continue the infection.

Bliſters were immediately applied to the inſide of the thighs of moſt of the infected ſheep; whether the ſmall-pox was of the diſtinct or of the confluent kind; and in the others, inſtead of the bliſter, a ſeton was cut. The ſuppuration was ſoon eſta-

bliſhed by the one and the other of theſe means, and the effects which they produced were ſenſibly advantageous. The former of theſe creatures were not left wholly to nature; but ſhe was aſſiſted when neceſſary by decoctions of juniper-berries, or by decoctions of ſaffron in the proportion of a quarter of an ounce to a pound of water: and theſe remedies were given through a horn. In the confluent kind, recourſe was had to the Peruvian bark, which is known to prevent and even to cure gangrenes. It is a medicine which promotes a favourable ſuppuration. Half an ounce of roots of ſwallow-wort was boiled in a pound of water; and in the ſtrained liquor was put a dram of Peruvian bark in powder: it was then boiled up again, and the ſediment was given with a horn every morning and evening: by way of precaution, ten grains of ſalt of wormwood were added to each draught, in order to give the more activity to the bark.

Camphire was tried on other ſheep which had the confluent ſmall-pox. Thirty grains of it were rubbed into the yolk of an egg, then mixed with a doſe of the foregoing decoction, and given with a horn morning and evening.

When the diſeaſe fell on the eyes, the following collyrium was uſed.

Take two handfuls of quince leaves, two drams of rind of pomegranate, one dram of ſeeds of ſumach, infuſe them for ſome hours in a pound of warm water, then give it a ſlight boiling, filtre it, and, after having added to eight ounces of this decoction two grains of camphire and eight grains of ſaffron, foment the eyes of the creature with it.

Emollient glyſters were given occaſionally, and purges towards the cloſe of the diſeaſe. This practice was attended with ſo much ſucceſs, that out of

twenty-two ſheep which were ſeized with the diſorder, only one died.

M. Haſtfer treats this diſeaſe in a manner very different from the above related. He attributes it to a too great quantity of humours, and preſcribes only dry, ſweating medicines, ſalt, lovage, rupatorium, ſome grains of civet, and all in a dry form: and, what is ſtill more, he forbids giving any drink to the ſheep whilſt they are ſick. This method may ſucceed in Sweden, a cold country, in which the perſpiration is but little, the plants more watery, and the blood more ſerous: but ſurely ſuch treatment would not anſwer in Languedoc, Provence, or any other warm climate, where the food is drier, and carries leſs moiſture into the blood. Regard ſhould always be had to the country and climate, in the treatment of every diſorder, whether epidemic or other. The ſituation of Naples, bordering on the ſea, in the naighbourhood of a vulcano, in a country which abounds with ſulphur; that of Rome, in a champain country, waſhed by a river whoſe waters having but little deſcent, move ſlowly, are very different from that of Paris or Lyons, cities more inland, and in a colder climate. This difference in ſituation and climate muſt occaſion a difference in the nature of diſeaſes, and conſequently ſhould do the ſame in the method of treating them.

It is not leſs neceſſary to know how to guard againſt the contagious diſtempers of cattle, than it is to be acquainted with their natures, and a ſucceſsful method of cure. To prevent a contagious diſtemper, the creatures expoſed to it muſt be preſerved from the influence of the cauſe, or the cauſe itſelf ſhould be corrected. When the contagion is the effect of the conſtitution of the atmoſphere, it is very difficult to preſerve animals from its influence; for being continually expoſed to its

immediate contact, they breathe it, it enters with the food into the ſtomach and inteſtines, it penetrates into the ſubſtance of the lungs, and in each of theſe places it communicates its noxious quality. It has, however, been found by experiment, that the conſtitution of the air may may be changed for the better. We are told of what advantage the fires which Hippocrates ordered to be made were in the plague. Levinus Lemnius (*Lib. II. de occult. Nat. Mirac. cap.* 10.) ſays that the garriſon of Tournai kept the plague off from that city by firing ſo many cannons and burning ſo much gun-powder that the air was totally changed thereby, and the city preſerved from that dreadful ſcourge. In fact, nothing is fitter to correct the bad qualities of a putrid air than that excellent antiſeptic, the ſulphurous and nitrous acid ſet at liberty by the deflagration of gun-powder. It would therefore be adviſeable to burn ſulphur and nitre in the buildings where the animals are lodged, or to cauſe vinegar to be boiled in them till it is totally evaporated. Juniper-berries, myrrh, olibanum, aſſafœtida, may alſo be burnt in them; but theſe laſt fumigations ſhould be uſed only in the winter, nor are they at any time ſo efficacious as the acids. The habitations of the cattle ſhould be kept as clean as poſſible, their walls ſhould be white-waſhed, or waſhed with vinegar, the litter in them ſhould be frequently renewed, their doors or windows on the north ſide ſhould be opened, and thoſe on the ſide from whence the infectious air proceeds, ſhould be kept ſhut, as adviſed by Varro.

The bad effects of air may alſo be prevented as follows. If the conſtitution of the air tends to produce inflammatory diſeaſes, it is proper to bleed the creatures expoſed to it, to give them from time to time acidulated drinks, to prevent their being expoſed to great heats, not to put them to

hard labour, to take care that they do not paſs ſuddenly from a hot to a cold place, and that they do not drink too-cold water when they are heated. If, on the contrary, the conſtitution tends to produce putrid diſeaſes, it would be proper to purge them with crocus metallorum, or aſſafœtida, or roots of briony, or with aſſarabacca, to give them acidulated antiſeptic drinks, and to rub them often, as well to free them from infectious particles which may adhere to the hair, and penetrate the ſkin, as to increaſe the perſpiration; for it is not to be conceived how many diſorders ariſe from a ſuppreſſion of perſpiration, and how ſalutary it is to keep the perſpiration clear.

When the contagious diſeaſes of animals ariſe from the bad quality of their food, it is certainly in our power, in a great meaſure, to prevent them. All plants prejudicial to the health of cattle ſhould be rooted out of every paſture; which is eaſily done with a ſpade, when the plants are in bloom; for if they are then cut through beneath the ſurface of the ground, and the clod is again replaced, the remaining root will periſh, and thus the whole paſture may in time be cleared of them. Artificial graſſes may be ſown inſtead of the natural. The world is now acquainted with the benefits which ariſe from ſuch graſſes, both in regard to their quantity and their quality. Lucerne, ſainfoin, and clover, are known to be very wholeſome and very nouriſhing. As they grow to a pretty good height, the effects of a mildew or blight may be prevented in them, which cannot be done in plants that creep along the ſurface of the ground. Thus it is a common practice, when corn is mildewed, for two men, holding each of them the end of a rope, and being as far aſunder as the length of the rope will permit, to run along the fields of corn: the rope either ſhakes off the vermin which occaſion the

blight, or makes the mildew fall off by the ſhaking of the corn, which afterwards recovers itſelf. If this method does not prove effectual when uſed on artificial graſſes, the owner ſhould not heſitate to cut down the paſture, burn what is infected, and endeavour to procure a freſh healthy growth. At all events, cattle ſhould not be ſuffered to feed on infected graſs of any kind, nor even in the field where that graſs was, till a new growth has ariſen.

Cattle ſhould not be ſuffered to drink putrid ſtanding water, eſpecially in an infected ſeaſon: for, as was before obſerved, the water which was expoſed to the air during the plague of London, became covered with a blue pellicle, which mixed with bread and given to a dog, made the creature die mad. Such a pellicle may adhere to all ſtanding waters, and will be more or leſs dangerous, according as the air is more or leſs infected, and the water is more or leſs loaded with putrid ſubſtances.

As water is an indiſpenſably neceſſary article of food, every bad quality in it is the more dangerous, and the means of correcting them are the more requiſite and valuable. In order to attain this deſirable end, a very ſimple, eaſy method was tried before the laudable Society for the Encouragement of the Arts, &c. at London, with the wiſhed-for ſucceſs. It was found that clay, mixed in putrid water, to ſuch a degree as to take off the tranſparency of the water, ſo that a hand held under its ſurface, could not be ſeen through it, ſoon ſettles to the bottom if ſuffered to ſtand ſtill, and carries down with it all ſuch vegetable or animal putrid ſubſtances as are mixed with the water. Theſe ſubſtances, kept aſunder, and buried as it were in the clay, ceaſe to putrify, and the water remains perfectly clear for a long time. It is almoſt needleſs to obſerve, that if there are any living inſects in the water, they ſhould be ſeparated from it, by

running the water through ſomething which ſhall keep back thoſe inſects, or their brood, which may be too bulky to be carried down and buried in the clay. If the putrefaction be great before theſe means are uſed, a diſagreeable ſtench may ſtill attend the water, though it appear clear. The Rev. Dr. Hales, that friend of mankind, has taught us to get rid of this by ventilating the water, that is, by forcing through it air, which carries off the remaining putrid taint. If any object to the trouble of preparing in this manner a ſufficiency of water for a whole herd of cattle; all the anſwer that ſuch deſerve is, that if they think the health of men and of beaſts not worth this trouble, it is in their power, they and their cattle, to crawl ſlowly, but certainly, to the grave. Even amongſt mankind, many of the uſual autumnal epidemic diſeaſes might be prevented by this eaſy method: for the bad water which is drank at that ſeaſon gives riſe to many diſorders in the bowels, as well as to fevers of various kinds.

If clay cannot be had, it is adviſeable to ſhake the water well, or have it toſſed about by oars, before it is given as drink. Thus it is that people on board of ſhip render their corrupted water leſs unhealthy by beating it; by which means the impurities in it fall to the bottom of the caſks. Mr. Boyle having taken ſome water which had gone a long voyage, beat it frequently; by which means all its impurities ſubſided, and it became perfectly pure and wholeſome. Where ſweet water is wanting, a well ſhould be dug.

If a contagious diſeaſe has unhappily ſeized a herd or flock, every means poſſible ſhould be uſed to prevent its ſpreading. The firſt care to be taken is, to cut off all communication between the ſound and ſick. Cattle collect the graſs with their tongue before they bite it; by that means ſome of

their ſaliva neceſſarily adheres to the graſs which remains, and if they are diſtempered, the graſs is of courſe infected; and other cattle which feed on it catch the contagion. Again, cattle are fond of licking one another; and as their tongues are rough, there ſticks to them a great deal of hair, which afterwards forms in their ſtomachs balls called *egagropiles*, which incommode them much when they become of a conſiderable ſize: but this is not yet the greateſt evil. The perſpiration is vitiated in infected animals, and their hair falls off eaſily: the infection adhering to the hair thus licked off by a ſound animal, becomes an infection to this laſt, and thus it may be ſpread to many. The herds ſhould therefore be frequently viſited, in order that every creature of which there is the leaſt ſuſpicion may be ſeparated from the ſound, which laſt muſt no longer feed on the ſame paſture, nor drink of the ſame water with the former: even the cribs, trays, tubs, or any other thing made uſe of for the ſick, muſt not be brought near the ſound, at leaſt till they have been waſhed well with lime-water or vinegar, and afterwards fumigated. The perſons who attend the ſick cattle ſhould not approach the ſound ones before they have waſhed themſelves, and changed their garments, which, in this caſe, ſhould be of flax or hemp, and not of woollen; becauſe wool imbibes the contagion, retains it, and readily communicates it.

On the above principle it was that Lanciſi propoſed to a congregation of Cardinals, during the afore-mentioned plague which made ſuch havock in Italy, to kill not only all the cattle that were manifeſtly infected, but even all thoſe that there was but the leaſt room to ſuſpect of being infected. This advice was rejected after a long debate, and it was too ſoon experienced how much wiſer and more prudent it would have been to follow it. A

proof of this ſoon reſulted from the town of Capravola. Five bullocks there were ſuddenly ſeized with the diſtemper; and after immediate ſtrict inquiry it was found, that a ſtrange bullock had been introduced into the incloſure where all the cattle belonging to the town were kept. The infected bullocks were immediately killed, and the diſtemper ended there.

All thoſe who took ſufficient care to prevent the entrance of any infected creature into their lands, not only about Rome and the eccleſiaſtical ſtate, but alſo in the territories of other princes, preſerved their cattle. Such was the effect of the vigilance of the princes Pamphili and Borgheſe, that, though at the very gates of Rome, and in the province the moſt infected, all their cattle eſcaped unhurt. The ſame care preſerved the fields of Corneto, of the patrimony of St. Peter, of Umbria, of Picenum, of the Flaminian province, of Tuſcany, and of Modena: and it is likewiſe by the ſame means that the convents of nuns are generally preſerved from the plague, when it unhappily attacks mankind (*a*). By a ſimilar care the Temple was preſerved from the plague, when it made ſuch havock in London in 1666.

Too much care cannot be taken that the bodies of creatures which have died of contagious diſeaſes be buried deep, eſpecially in warm and moiſt countries; not only to prevent carnivorous animals from being infected, which may ſoon ſpread the contagion, but alſo to avoid increaſing the putrid exhalations with which the air is already too much loaded. They were very near being fatal to the French in Minorca. That iſland being a rock covered with very little earth, it was not poſſible

(*a*) See *Lanciſi Opera, Tom. II. Gen.* 1713. *Diſſert. Hiſt. de Bovillâ peſte.*

to bury the bullocks which died; they were thrown into the harbour, with heavy weights tied to them: but notwithſtanding this precaution, the bodies ſoon roſe up and floated on the ſurface of the water, which is conſtantly the caſe as ſoon as an incipient putrefaction ſets the fixed air in the animals at liberty, and the bodies become ſpecifically lighter than the water. Theſe bullocks infected the air of the port with a horrible ſtench, which rendered ſick many of the ſeamen who remained on board of the ſhips; and though the carcaſes were towed out into the open ſea, yet as the current brought them frequently back, it was found that the only ſafe way was to burn them.

Reflecting men obſerved, with much concern, that, during the contagious diſtemper which prevailed from 1740 to 1750, the country people, in France in particular, took very little care to prevent the ſpreading of the contagion. They ſkinned their dead cattle, and kept the ſkins; an œconomy fatal to the ſurviving cattle, and ruinous to their owners. None ſhould be permitted to keep ſuch ſkins, unleſs they are immediately put into lime-water, and ſteeped in it for ſome time. The dung of diſeaſed cattle does not require leſs attention, becauſe the infection is quickly communicated by it when it is left expoſed to the air. Every particle belonging to infected creatures ſhould therefore be immediately burnt, or buried very deep.

When one is obliged to make uſe of a building in which creatures infected had formerly been, too much care cannot be taken to clean the floor, walls, roof, and every other thing belonging to it, and alſo to ſweeten the air: for it has been obſerved, that healthy creatures have been ſeized with contagious diſeaſes by being put into buildings in which infected animals had been, even though thoſe

buildings had not been uſed for a conſiderable time. Trincavel relates (*Lib. III. Conſil.* 17.) that ropes, which had been made uſe of to carry out dead bodies in time of a plague, being taken out of a trunk in which they had been lain twenty years, by a ſervant, he and ten thouſand more died of the plague. Sennert (*Tom. II. p.* 150) mentions a plague at Breſlau, which was communicated in 1553, by linen that had been locked up ever ſince 1542. Since then the contagious virus will remain ſo long dormant, and yet retain all its ſtrength, too much care ſurely cannot be taken to purify the buildings into which cattle are to be put. It is not enough to clean them and keep the doors and windows open: every part of them ſhould be well waſhed with lime water or vinegar, fumigations ſhould be burnt in them, and vinegar, or ſpirit of nitre, ſhould be boiled in them till totally evaporated.

By ſtrictly attending to the above precautions, we may hope to prevent many contagious diſtempers, to hinder their ſpreading, and even to cure, by means of the few medicines here mentioned, conſiderable numbers of infected cattle.

Additional Obſervations on the Diſeaſes of Cattle, and on their Cures; by the Royal Society of Agriculture at Paris.

TOWARDS the end of the year 1762, a formidable diſeaſe attacked the cattle in the pariſh of Mezieux, in the province of Dauphiny. The bullocks and cows were chiefly affected by it: but few horſes or mules felt it.

During the firſt twenty fours hours the following ſymptoms appeared. A refuſal of all kinds of

food whether ſolid or even liquid, a heavineſs of the head, hanging of the ears, watery eyes, rough and dull-looking hair, a coſtiveneſs not to be got the better of, a painful ſwelling about the lower jaw and along the neck, a pulſe rather dull than frequent, a diſcharge of a frothy humour from the mouth and noſe of ſome. Theſe ſymptoms continued for two, three, or four days, at the end of which a great beating in the loins, and the feebleneſs of the ſick creature, foretold a ſpeedy and inevitable death.

The farriers and country people bled them in the ears, gave them cordials, and adminiſtered drinks with a view to purging, but which contained nothing capable of producing that effect. At length the progreſs and ravages made by the diſeaſe determined the unhappy huſbandman, on the point of being ruined, to apply elſewhere for the help of which he felt how much he ſtood in need. More intelligent perſons ſought in the dead bodies of the animals, that which the ignorant and uninformed could not diſcover in them. A beginning of putrefaction ſhowed itſelf, by livid ſpots, in the hind part of the mouth, in all the muſcles of the pharynx and larynx (the gullet and windpipe) in the cellular membrane which ſurrounds them, in the whole paſſage of the æſophagus, and in the trachea arteria. In ſome bodies the cawl was affected, in ſome others the inteſtines. In theſe laſt the ſpleen was greatly ſwelled; in the former, neither the liver nor the lungs were in a natural ſtate, and in all, the digeſtion was depraved, as it uſually is in all dangerous diſeaſes; for the paunch was filled with the food they had taken down before the diſorder had openly appeared in them. The red, and ſometimes brown or even black colour, the ſwelling, the ſoft conſiſtence of the parts about the throat in the greater number of the dead, were the

conſequences of a violent inflammation, not of the eriſipelas or phlegmon-boil kind, for theſe would have excited a greater degree of fever, and would have ſhowed themſelves with a more remarkable pain and hardneſs; but of a latent inflammation, and a ſwelling cauſed by the want of action in the parts; ſuch, in ſhort, as is found in malignant diſeaſes. A ſimilar diſorder happened at the ſame time in the town of Macon, where a gangrenous quinſey carried off rapidly a prodigious number of people. This ſwelling frequently extended itſelf to all the glands of the lower jaw and about the neck and cheſt; thereby forming conſiderable tumours on the outſide, which in many creatures came to ſuppuration either naturally or by the help of art. In ſome, the throat was not ſo dangerouſly affected; but tumours appeared in all parts of the body indiſcriminately. Theſe were not the leſs looked upon as critical depoſits, and accidents which attended a diſeaſe owing to the ſame cauſe, and of the ſame character. In effect, the ſame treatment, except ſo far as the different depoſits required a particular method of cure, preſerving the lives of fifty-three out of ſixty-two; whilſt out of forty-nine which were treated in the common way, not one eſcaped.

The ſummer had been very hot, and the drought very great. The only paſtures to which the cattle could be led were bordering on a pond full of muddy, ſtanding, putrid water. The place neareſt to this was a dry gravel, heated by the ſcorching ſun, and conſequently a truly burning abode for the cattle, which were there moſt part of the day. Thus the exceſſive heat of the ſeaſon, the indifference of the paſture, and chiefly the bad qualities of the water, were the firſt cauſes of this diſeaſe: for all the juices being heated and rarefied, there was neceſſarily a great loſs of the moſt fluid and

ſubtle parts of the blood, and the corrupted ſtate of their food gave the diſorder a putrid turn. The hind part of the mouth, the larynx and pharynx affording a continual paſſage to very hot air, and the mucus which ſhould naturally moiſten them being leſs, owing to the blood's being deprived of it, or to the excretory ducts being dried up, the whole became very ſuſceptible of inflammation. Add to this the bad qualities of their food, and we ſhall not wonder that the inflammation degenerated into a quinſey truly gangrenous.

What in all ſimilar fatal caſes ſhould be firſt attended to, became here the firſt object of our care. All communication was cut off between the ſound and the ſick: for the ſureſt way to avoid the plague is to fly from it. The cattle which had hitherto eſcaped were therefore taken out of the infected houſes, after having been ſtrongly rubbed with wiſps of ſtraw previouſly fumigated with thyme, roſemary, ſage, and other aromatic plants, on which a ſmall quantity of vinegar was caſt while they were burning. The buildings into which they were put were cleaned of whatever dung was in them, and fumigated with juniper and bay-berries bruiſed and ſteeped in wine-vinegar and burnt on live coals: others were fumigated with only the fumes of vinegar. The diſeaſed cattle were afterwards carefully confined within the limits in which the diſorder unhappily reigned; thereby to prevent its ſpreading. The ſame precautions that were taken with regard to the ſound cattle, were extended to all in general, to the extent of the boundaries of the village: all were bled again in the jugular vein, and by means of that evacuation, by rendering all their drink lightly acidulated, by diminiſhing the quantity of their food, by not ſending them too ſoon to graſs, by not ſuffering them to remain too long in the heat, and not to

be out at all in the night; and laſtly, by giving them ſweet water to drink, above three hundred bullocks and cows were entirely preſerved from this infection, which never went beyond the limits firſt ſet to it.

The ſound cattle being thus taken care of, the infected were treated as follow: the buildings were cleaned and fumigated with the ſame care as for the others; the neceſſity of renewing the air became indiſpenſible. The buildings were in general very injudiciouſly conſtructed, low and not airy. The conſtant reſpiration and perſpiration of the animals that were in them ſoon deprived the air of its vivifying principle, and thoſe animal particles ſoon putrefied. From both theſe cauſes, the original tendency to putrefaction was much accelerated. Lofty buildings were therefore prepared for the ſick, and they were kept well aired by windows which admitted a conſtant ſupply of freſh air at the ſame time that they carried off the bad.

The inexpreſſible advantages ariſing to mankind from that attention which the Rev. Dr. Hales excited to the preſerving of the air ſweet, eſpecially where there are ſick, or numbers aſſembled together, calls upon us in this place to pay him that tribute of praiſe which his unbounded beneficence deſerves. A window in each end of ſuch buildings, and as near to the roof as can be, is, in this caſe, very uſeful; becauſe the one admits freſh air, while the other diſcharges the noxious air; and this without cooling or altering the temperature of the air near the ſick.

Many of theſe ſick cattle were bled in the jugular; but that was only once, and in the very beginning of the diſorder. Care was taken not to perform this operation after the ſigns of putrefaction had appeared. Water whitened with bran was their only nouriſhment. An ounce of cryſtal

mineral was added to a pailful of this water, for ſome; and for others the water was acidulated with vinegar, which was preferred to every other acid. Cooling glyſters were not forgotten. Two of them were given daily to each of the ſick animals. They were compoſed of leaves of mallows, of pellitory of the wall, and of mercury, of each two handfuls, boiled in five pounds of common water to a conſumption of one fourth. Two ounces of common honey, as much oil of olives, and one ounce of cryſtal mineral were added to this when ſtrained off.

Injections were alſo thrown up the mouth and noſe two or three times a-day. Theſe were compoſed of the leaves of plantain, briar and agrimony, of each a handful, boiled half an hour in four pounds of common water, to which were added, when ſtrained off, two drams of ſal-ammoniac; and ſometimes in place of this ſalt, two ounces of oxymel ſquills were mixed with this liquor. The liquor thrown by a large ſyringe into the noſe, deſcended into the back part of the mouth, and moiſtened and waſhed all its parts. It was the more neceſſary that theſe parts ſhould be well cleaned, becauſe they generally were the parts moſt affected. The creatures were likewiſe from time to time made to ſnuff up the volatile ſpirit of ſal-ammoniac, and doubtleſs the volatile fumes penetrating into the live parts, ſtimulated them, and excited in them a motion, by the help of which the diſeaſed parts exfoliated or caſt off in white filaments.

The tumours which appeared externally were ſuppurated as ſpeedily as poſſible. The ripening poultice or cataplaſm uſed for this purpoſe was made of leaven with one third of baſilicon. When this was thought inſufficient, another was ſubſtituted in its place, made with ſix bulbs of lilies roaſted under the aſhes of a wood fire, four ounces

of white lily roots and four handfuls of ſorrel boiled in four pounds of common water, and afterwards bruiſed in a mortar. Two ounces of hog's lard, and a like quantity of common honey, old greaſe and baſilicon were mixed with them; and laſtly, according to the circumſtances, half an ounce of galbanum diſſolved in wine, and an equal quantity of gum ammoniac in powder were added. As ſoon as a fluctuation was felt in theſe tumours, they were opened with a knife or cauſtic, but moſt frequently with the actual cautery, to excite a more plentiful ſuppuration by giving the greater ſtimulus to the veſſels. If it was not poſſible to open all the tumours externally, one or two glyſters were immediately injected, in order to prepare the way for a purging drench, leſt the matter being abſorbed into the blood, might add to the already too-putrid diſpoſition of the blood. The purging potion was compoſed of an ounce of the leaves of ſenna infuſed for three hours in a pound of boiling water; and in this liquor, when ſtrained off, an ounce of bruiſed ſuccotrine aloes was infuſed all night over hot aſhes, and given to the animal warm in the morning out of a horn. This was repeated as occaſion required, till the ſymptoms diſappeared: and then the creatures were gradually brought back to their uſual wholeſome food.

One of the diſeaſes which made the greateſt havock, was that which, in the year 1763, left ſcarcely any cattle alive in the diſtrict of Brouage in the election of Marennes, in the generality of Rochelle. The accurate account given of it by M. Nicolau, M. D. on the eleventh of September, 1763, is ſo full of inſtruction, that it ought not to be omitted here.

"The pariſhes in which the diſtemper among the cattle exert its greateſt fury, are ſituated on the borders of a low country, in extent about three

leagues. It was formerly laid out in ſalt-pits; but the communication with the ſea has been ſince cut off, and the ſea now comes no farther than the town of Brouage. The whole remains in the uneven ſtate it was in when employed for making ſalt; and the hollows and riſings ſtill retain all the appellations then given them. Some of the hollows have been in time imperfectly filled up, and others remain in nearly their former ſtate. They are filled with water in rainy ſeaſons, eſpecially during the winter; and the water, not having any outlet, ſtagnates till the ſun and heat of the ſummer have evaporated it. The deepeſt, which ſeldom dry intirely, form ſo many pools full of aquatic plants, and, notwithſtanding that, are made to ſerve as watering places for the cattle. The whole forms a vaſt ſlimy, marſhy meadow, in which are fed numbers of cattle intended for the butcher, and for the farmer's work. It is the loſs of theſe which has in part occaſioned the miſery of the inhabitants of that place.

"Theſe receptacles of mire ſpread far around fœtid exhalations which infect the atmoſphere, and render the inhabitants ſubject to intermitting putrid malignant fevers towards the end of the ſummer. The diſagreeable ſmell is particularly felt at ſun-riſe in good weather.

"During the ſpring and ſummer of this year, 1763, the rains have been almoſt inceſſant, and the weather conſtantly cool. In the greateſt heat, Reaumur's thermometer, in a room facing the north, did not exceed 18 or 19 degrees (from 64 to 68 of Fahrenheit's). On the 3d of July we had a ſtorm, accompanied with hail of an uncommon ſize, which in many places deſtroyed every kind of crop, and did conſiderable damage to the buildings. Moſt of the large cattle which the diſeaſe has carried off were expoſed to this ſtorm, and felt all its

violence; but the ſheep and ſwine, to whom the diſtemper proves equally fatal, were under ſhelter. Beſides, the mortality had begun before.

" There was great plenty of graſs, owing to the conſtant rains; but theſe have prevented its being made into hay. Great part of it periſhed without being cut, or rotted after it was cut. The cattle were expoſed night and day to the inclemency of the ſeaſon. All the fruits both of the ſummer and the autumn have failed, and the trees are now (Sept. the 11th) in bloom, as in the ſpring.

" The graſſes which grew in this place did not appear to me to be unwholeſome for cattle; and even if there were any ſuch, the principal cauſe of the contagion ought not to be imputed to them, ſince the ſheep which fed elſewhere, and ſome horſes which lived on dry hay, were equally affected, as well as the ſwine which did not feed on it.

" The mortality ſpreads to the other domeſtic animals, without excepting even the poultry*, which periſhed in a hamlet of St. Symphorian. Yet, however epidemic the diſorder is, there is room to think it not contagious. Numbers of dogs died in ſeveral pariſhes, which had eaten of the fleſh of the diſeaſed cattle; but others which had not eaten of it died likewiſe, and ſome continued to eat daily of it without being incommoded.

" In the month of May laſt (viz. in 1763) ſome complaints appeared on the tongues of the horned cattle in a few contiguous pariſhes; but that was

* The Royal Society of Paris obſerve here, that the diſtemper of which the poultry died in the above-mentioned village, may perhaps not have been the ſame as that which killed the cattle, nor produced by the ſame cauſes; for that the mortality amongſt fowls was pretty general every where, and ſeemed to have been the conſequence of a great inflammation on the breaſt, like that which affected the dogs.

only a falſe alarm, for the complaints went off without doing any miſchief. In June, and in the beginning of July, the reigning diſtemper ſhowed itſelf among the ſheep, and has committed ſuch havock as not to leave one of them in ſome places; and in others, the few that do remain are abandoned by their ſhepherds and left to die, literally ſpeaking, like rotten ſheep, without any care being taken of them.

" The mortality among the horned cattle, horſes and other animals, has been fatal principally to two pariſhes ſince the end of July. It now ſpreads on all ſides, though with leſs havock in ſome places than in others.

" The firſt ſymptoms obſerved in them was their abſtaining from food. I do not mean to ſay, that no other ſymptoms precede this; but the keepers of the herds, little experienced in, and as little attentive to, ſuch objects, do not diſtinguiſh them. This prelude awakens attention. The creatures are obſerved to be melancholy, to hang their heads, to have cold and drooping ears, rough hair without its uſual luſtre, loins fallen and beating, the belly hard and full, the whole body wreathed and ſeeming to be diſpoſed to make efforts to urine. The urine which they void is often as clear as water; it is ſeldom that any thing paſſes by ſtool, and chewing of the cud ceaſes in the horned cattle. In a few hours after, if no tumours appear on the ſurface of the body, they are ſeized with a ſhivering, their eyes become dull and watery, a tough ſnivel iſſues from the mouth and noſe, they lie down and die quietly, or are more or leſs convulſed. In this extremity they ſtretch their heads out frequently, pant for breath, fetch long ſighs, and ſometimes too they cough. Theſe ſymptoms often come on ſo rapidly, that the creature dies before they have been ſeen: many bullocks have

dropt down dead under the yoke. The quicker the ſucceſſion of theſe ſymptoms is, the greater is the danger. A violent ſhivering is always fatal. When the ſymptoms come on more gradually, there commonly is no ſhivering, but if there be, the danger is in proportion to its violence and duration. It ſometimes happens that tumours appear indifferently in all parts of the ſurface of the body. They ſometimes remain fixed in the part where they firſt appeared; at other times they diſappear, to ſhow themſelves elſewhere; if they vaniſh intirely, the creature dies; if, on the contrary, they increaſe in number, and on the parts leaſt eſſential to life, whilſt the creature ſtill retains its ſtrength, there is room to hope for a recovery. Daily experience begins to prove, that the cure depends eſſentially on the character of theſe tumours as approaching the neareſt to a phlegmon, and on their good iſſue.

" The tumours are not of the inflammatory kind. They ſeem firſt of all to affect the muſcles. The part affected feels hard, without being much ſwelled. Soon after a humour inſinuates itſelf into the cellular membrane around, which relaxes the fibres ſteeped in it, enervates them, and raiſes a lump in the ſkin. If it is not immediately diſcharged by an opening, its ſtay produces a gangrene which ſoon ſpreads farther; or if the humour falls on any of the bowels neceſſary to life, the creature dies before the gangrene has made much progreſs. Theſe tumours are flabby, and yield only a thin, reddiſh ſanies. If a ſuppuration comes on, all does well, the creature recovers ſtrength, and appetite to eat. If, on the contrary, there is only a thin diſcharge without ſuppuration, the cure goes on but ſlowly, the creature languiſhes and ſinks, till by the falling off of all the gangrened ſloughs, the wound appears

well coloured, and the cattle themſelves lick it with their tongues in order to heal it.

" The gangrene which ſucceeds this tumour is of a very particular kind. The cellular membrane and the fleſh ſeem to be rather macerated than rotten. They look of a pale colour, inclined to livid; and though their fibres ſeem diſuniting, they retain a pretty firm conſiſtence: but the ſlough which caſts off before the cure, is black, fœtid, and quite mortified. If the tumours continue long in a lax flaccid ſtate, there is great danger of the matter's being reaſſumed into the blood, and conſequently of its falling the more violently on ſome other part. This happened to ſeveral creatures of different kinds. They died, either becauſe the diſcharge was interrupted, or becauſe it came out but imperfectly. The more ſenſible the diſeaſed fleſh is, the greater is the room to hope for a cure; and the more inſenſible it is, the greater is the danger.

" When the tumours, from being flat, as they are at firſt, riſe higher into a round circumſcribed form, becoming at the ſame time more firm and elaſtic, it is a ſure ſign that nature is getting the better of the diſeaſe, by changing that thin diſcharge into a tumour of the inflammatory kind; which being in a convenient place, always ends well. The weakneſs and faintneſs ſoon change for the better when theſe favourable ſigns appear. The flies of every kind, which, attracted by the ſmell of the ſickneſs, ſettle on diſeaſed creatures in greater numbers in proportion to their weakneſs and inability to ſhake them off, leave them likewiſe in proportion as their ſtrength returns. A livelineſs and deſire of eating ſucceed their former dull ſtate.

" The humour contained in theſe tumours, ſhows itſelf ſometimes from the very beginning to

be of great acrimony, almoſt cauſtic. M. Drouhet, ſurgeon at Point l'Abbé, has obſerved, that having opened one of theſe tumours on the inner and upper part of the thigh of a bullock, the humour diſcharged from it ſtripped off the hair in twenty-four hours, as if the part had been ſteeped in boiling water. The bare ſkin appeared very red and inflamed. The tumours which ſhow themſelves on the breaſt of a horſe are the moſt dangerous; and on the contrary thoſe which are formed in the part correſponding to that which is called the dew-lap in a bullock, are the leaſt dangerous. Thoſe which come in the muzzle, mouth, or fundament of any creature, prognoſticate the worſt of events. It is in this laſt caſe in particular, that the creature, either whilſt dying or when dead, bleeds at the mouth, or noſe, or fundament, and ſometimes at all of theſe together.

" One of the ſymptoms moſt commonly met with on the opening the dead bodies, is a want of digeſtion. The whole inteſtinal canal is generally empty, while the ſtomachs are full, and as it where crammed with graſs, which is more or leſs hard in the third ſtomach of animals which chew the cud. This happens though they have ceaſed to eat for ſeveral days before their death; and even when a ſudden death takes them off before they have diſcontinued to eat.

" The blood taken from the ſick creatures coagulates readily, and is ſoon covered with a thick hard cruſt, of a whitiſh colour, a little inclining to yellow Bleeding, when properly timed, has had ſenſibly good effects; but when done at an improper time, the conſequences have always been fatal. Moſt of the drenches hitherto given have ſeemed to haſten death, according to the report of thoſe who have made the greateſt uſe of them.

" Though the cauſes of epidemic diſeaſes are ſeldom known, yet I think we may impute the diſorder here ſpoken of to the too long continued moiſture of the air, owing to conſtant rains, fogs, and ſtorms, which have not ceaſed during the whole of this year (1763). To this may be added, that the moiſture, which had penetrated deep into the earth, may, riſing again, have ſpread in the air uncommon exhalations, which may likewiſe have greatly affected the animal œconomy. But as diſquiſitions of this kind lead little to the cure, I ſhall not dwell any longer on them.

" This epidemic diſeaſe has ſo great a reſemblance with what we call in man, a putrid malignant, purple and peſtilential fever, that I do not ſcruple to give it theſe names in other animals. So much is it of the ſame ſtamp, that I met with three men in the country, on whom the anthrax or true peſtilential bubo had appeared; probably owing to their being ſo much among the infected cattle. Though, for want of judicious obſervers among thoſe who watch over the brute creation, we have not a regular account of the firſt ſymptoms by which the approach of the diſeaſe might be determined; yet, from the ſymptoms abovementioned, there were evident ſigns of an inflammation in the beginning, as will appear to every intelligent reader, from the recapitulation of them here made. The violence of the fever, and the concomitant putrid diſpoſition of the air, and alſo of the infection communicated, ſoon brought on a putrid ſtate of all the fluids, as appears no leſs dently from the ſymptoms already mentioned.

" During the courſe of my inquiries, I found but one peaſant who could give any account of the pulſe. This man, examining whether any tumour yet remained in a cow, put his hand between the upper part of the fore-leg and the breaſt, and felt

a frequent and ſtrong pulſation of the artery, which anſwers to the axillary in men. The animal was then feeding; but it ſoon loſt all deſire to eat, was thereupon judged to be diſtempered, and died ſpeedily after.

"The pulſation of the arteries is eaſily felt in moſt cattle, and particularly that of the temporal, the axillary, and the crural. The carotid artery in a horſe is frequently perceivable by the eye, in that part where the neck joins to the breaſt; and the artery may likewiſe be felt in that part of the leg of a horſe which anſwers to the ankle in man; and the crural artery is eaſily felt in ſheep.

"The excellent Dr. Hales, who let no inquiry eſcape him which he thought might be of uſe, has given, in his Hæmoſtatics, the number of pulſations which the arteries of different animals make in a minute. He counted forty-two in a minute in a horſe full grown and at reſt; ſixty-five in a very young colt; fifty-five in a colt three years old; forty-eight in a horſe five years old, but a native of Limoges, and conſequently of a country where theſe animals are very backward; thirty-two in an old horſe; and fifty-five, ſixty, and even up to an hundred in a horſe whoſe crural artery was cut on purpoſe for inſtruction. The pulſe was more frequent as the horſe approached its end. In full grown mares he counted from thirty-four to thirty-ſix; which proves that the pulſe is leſs frequent in the females than in the males, in brutes*. The arteries of bullocks and cows beat nearly the ſame as thoſe of horſes and mares. In ſheep, they beat about ſixty times in a minute; in dogs, about ninety-ſeven times. It is, however, to be obſerved, that the pulſe is far from being uniformly the ſame in each ſpecies, nor even

* This obſervation may be true with regard to brutes, but we think it is otherwiſe in women.

in the ſame animal, at all times; the frequency of pulſation frequently depending on many circumſtances, ſuch as reſt, food, as well as the degree of health. The frequency of the pulſe in the different ſpecies of animals may be ſaid to be in proportion to their ſize, ſloweſt in the largeſt animals, and quicker as they become leſs.

" In the beginning of the diſeaſes, the advice judiciouſly given by the Royal Veterinarian School at Lyons, ſhould be allowed. Bleeding, a ſpare diet, acidulated and nitrous drinks, and emollient looſening glyſters, will be of great ſervice. Theſe means may mitigate the ſymptoms, check the progreſs of the diſorder, and thereby procure time to place proper remedies fit to prevent that feebleneſs and great degree of putrefaction which are ſo much to be feared. The uſe of the former medicines is therefore to be followed, by giving liquors which ſtimulate, and yet are not too acrid; and by adminiſtering cordials and ſuch medicines as prevent the gangrenous diſpoſition. Emetics and purgatives are, in this caſe, given to men; but the ſtructure of the ſtomachs of cattle render the uſe of vomits impoſſible with them; and they are ſo hard to move by purgatives, that theſe become dangerous from their ſtimulating too much. Other animals whoſe ſtomachs will admit of vomiting, ſuch as dogs and ſwine, have been cured with the help of vomits.

" The putrid and acrid quality of the humours which are contained in the tumours, requires their being opened as ſoon and as faſt as they appear, be they ever ſo many. The longer the opening is delayed, the more the humours are corrupted. It is likewiſe right to draw the humour to places the leaſt dangerous, by applying cauteries, or making ſetons in them, though there is not any humour in them. The parts ſhould at the ſame time be

ſtrengthened by fomentations, ſuch as a decoction of ſcordium, made in wine and ſharpened by the addition of ſea-ſalt, or ſal-ammoniac. The wound ſhould be dreſſed with a ſuppurating medicine, covered over with ſome plant more or leſs acrid, according as it ſeems neceſſary to promote a greater flow of humours, or only favour the diſcharge of them. Louſewort, black hellebore, root of iris, &c. anſwer this purpoſe. When the wound becomes clear, it requires no other dreſſing than lint and a proper digeſtive or turpentine.

" By means of this eaſy and plain method, people, little accuſtomed to the care of cattle, have preſerved the lives of many; and it is to be lamented, that we have not in our country places more expert farriers, capable of carrying on a regular method: for by that ſtill more might be ſaved.

" The cattle never appeared fatter nor in better condition than they are this year (1763); and the diſeaſe has ſeemed chiefly to attack the fineſt and plumpeſt: no wonder that their owners are grieved to ſee them die."

M. Nicolau next gives an account of what was obſerved in the dead bodies.

" On the 23d of Auguſt, 1763, a bullock died at about four o'clock in the afternoon, after having been ſlightly convulſed. His body was not ſwelled, nor did the diſeaſe appear by any external mark. Being opened immediately after death, the fleſh appeared ſound, without any offenſive ſmell. After having cut the ſternum and pleura, a ſmall quantity of wind eſcaped, not at all fœtid; and the mediaſtinum, pleura, diaphragm, heart and lungs, were in their natural ſtate. When theſe viſcera were removed, ſome blood was ſpilt, which was not coagulated, but in a diſſolved ſtate. The lungs had ſome hydatides on the ſurface, filled with a thin ſerum. Otherwiſe nothing extraordi-

nary appeared either externally or internally. The tongue, mouth, and æſophagus appeared ſound. In the abdomen, the cawl was ſound. The ſpleen had ſome gangrenous ſpots upon the part which touches the ſtomach. The bile was thin, and of a ſomewhat paler colour than is natural. The ſtomach and inteſtines having been torn, through the unſkilfulneſs of the farrier, it was not poſſible to examine them with ſufficient exactneſs. However, the abomaſus appeared intirely ſphacelated, and the villous membrane fell off ſo eaſily, that parts of it were mixed with the food, and others lay upon it.

" A cow was obſerved to be ſick on the 22d of Auguſt, and in the evening of the 23d we were informed that ſhe was dying. As we were going towards her, in order to examine her, ſhe mounted very quickly upon a high heap of dung, where ſhe fell, and died in violent convulſions at about ſeven in the evening, emitting a thick ſlimy matter from her mouth and noſe. We opened her at eight in the morning of the 24th. Her belly was ſwelled, owing partly to her being big with young, and partly to wind contained in the peritoneum. No fœtid ſmell came from her, nor did any thing uncommon appear on the ſurface of her body.

" The ſkin being cut off, the cellular membrane appeared ſound. The milk which iſſued from her udder was white, of a due conſiſtence, and clear. The head and breaſt were in their natural ſtate; but the blood, which flowed plentifully from the large veſſels, was in a diſſolved ſtate, no where coagulated. A ſmall quantity of wind, not ſtinking, iſſued from the breaſt and belly. The ſtomachs were diſtended; and all of them were full of graſs, except the abomaſus, which contained a ſmall quantity of a muddy dark-coloured liquor. In general, the graſs contained in the other ſtomachs was not ſo dry nor ſo much chewed as in the bullock; yet it ſeemed ſufficiently ſo to render the

digeſtion extremely difficult. All the ſtomachs were deprived of the wrinkled membrane which covers their inſide. This membrane lay upon the food, and was partly mixed with it. Alſo ſeveral parts of the coat of the third ſtomach were deſtroyed, looked black and fell in rags on the leaſt touch. The inteſtines were quite empty and inflamed, as was alſo the meſentery. The inteſtines were likewiſe deprived of their inner villous coat, and in many places ſo ſphacelated, that they fell to pieces on the leaſt touch. Part of the cawl was in the ſame ſtate, whilſt the reſt of it appeared ſound. The bladder, the womb, the fœtus, and its covering, and all the reſt of the fleſh looked well, and had no bad ſmell; and what is remarkable, the corrupted parts had not a very bad ſmell.

"On the 28th and 29th of Auguſt, a horſe was obſerved to be ſick. The firſt thing that appeared was a tumour on the left ſide of the breaſt, from whence it ſoon extended over all the lower part of the neck. A farrier, in my preſence, deſtroyed the ſkin to the fleſh with a red-hot iron. The horſe ſhowed no ſign of feeling this operation; though he was at the ſame time ſenſible of the bites of flies in other parts of his body. There was no diſcharge from the wound, and he died at about five in the afternoon of the 31ſt. We opened him early the next morning. He ſtunk, and his belly was ſwelled. On the opening, a quantity of very ſtinking air iſſued out: all the bowels were in their natural ſtate, excepting ſome traces of inflammation. The ſtomach only was full of hay, though the creature had not eaten for three days before his death. The inteſtines were empty. The pericardium contained a great quantity of lymph a little bloody, in which the heart ſeemed drowned; its baſis was drenched, looſe, and as if macerated in it. All the fore-part of the neck from the breaſt to the jaw, that is to ſay, all the

tumour, appeared under the ſkin to be only a maſs of fibres, ſome white, others livid, all macerated and drenched in a mucilaginous lymph, reſembling a diſcharge from the noſe, a little tinged with blood. The fleſh all around was likewiſe very moiſt and livid; but elſewhere it was ſound.

" A ſheep, yet warm, was found on the 2d of September. The ſkin between the legs, where it is not covered with wool, was ſpeckled with red and purple ſpots. There was under its throat, between the two branches of the lower jaw, a tumour bigger than one's fiſt; and, upon opening it, there iſſued out a great deal of tawney ſerum, with which all the cellular membrane around, under the ſkin and between the muſcles, was filled. It reached as far as the baſe of the brain, which was likewiſe ſteeped in it. There appeared no ſign of gangrene elſewhere. The reſt of the body was ſound, both within and without, excepting that the inteſtines were empty. The three laſt ſtomachs were not too full; but the omaſus, or firſt ſtomach, contained a great deal of graſs. The liver had in it ſome old ſchirruſes, which ſeemed not to have any relation with the diſeaſe of which the creature died. The gall-bladder was of its natural colour, as well as the bile. The ſpleen was ſwelled, and ſtuffed with black blood.

" On the 7th of September, we examined ſix dead ſheep. The five firſt had no other ſymptom on the external parts of their bodies, than purple ſpots on the places free from wool. The ſixth had many more; beſides which, it diſcharged blood from the noſe and fundament; which laſt was ſwelled all round. We opened this ſheep. The head and all the reſt of the body were ſound and free from inflammation. The firſt ſtomach, called *omaſus*, was diſtended, and ſtuffed with graſs; the ſecond ſtomach contained leſs of it in proportion; the third ſtomach had but little in it, and that

ſomewhat hardened; the fourth contained a muddy liquor of a dark green colour; its coats were red, and its wrinkles a little gangrened. The inteſtines contained excrements, the cellular membrane around the anus was full of ſerum, and the veins were filled with clotted blood."

Dr. Nicolau's above-recited account of the diſtemper having been preſented to the Veterinarian School, this highly uſeful Society give accordingly their opinions thereon to the following effect, and the Royal Society of Paris have publiſhed it, in order to afford every help in their power in ſo great a calamity, in caſe the like ſhould happen again.

In this conſultation, they agree with Dr. Nicolau as to the cauſes of the diſeaſe, and are of opinion, that it conſiſts in a perverſion of all the humours, and in a relaxation, inaction, and ſtupor of the ſolids.

" As to the tumours which appeared externally, they ſhould, ſay they, with manifeſt reaſon, certainly be looked upon as a ſalutary criſis; eſpecially when there yet remained ſtrength enough in the ſolids, to throw the vitiated humours on the part where the obſtruction had begun, and by that means ſo far free the reſt of the maſs of blood.

" Even the ſound cattle in ſo unwholeſome a country as the diſtrict of Brouage, above deſcribed, carry in them the ſeeds of the diſorder, and therefore the firſt attention ſhould be directed to their preſervation. As to correcting the bad qualities of the air and water, enough has been already ſaid on that head, as well as of purifying the places into which the ſound cattle are to be put. Particular care ſhould be taken that their food be wholeſome; and if it be dear, it may be given in leſs quantity: for it is better that the cattle become lean, than that they die. Running water ſhould be got for them, if poſſible: but if they think ſtanding water, vinegar ſhould be mixed with it, or red-hot irons may be quenched in it. It ſhould,

if poſſible, be boiled; and the following preſervative may be given them.

"Take two handfuls of juniper-berries, bruiſe them, and let them infuſe twenty-four hours in a quart of wine-vinegar; give half a pint of this liquor morning and evening. Repeat this remedy once or twice a week, even to the animals which appear perfectly ſound. As to thoſe in which the leaſt ſign of ſickneſs appears, give them the following medicine:

"Take Peruvian bark in powder, and filings of ſteel, of each two drams; one dram of ſal-ammoniac; mix them in half a pint of wine, or in the ſame quantity of a ſtrong decoction of juniper-berries in water, and give this with a horn every morning and evening for a week.

"In the cure of the diſeaſed, bleeding ſeems rather a thing to be avoided; for it inevitably increaſes the loſs of ſtrength, the inaction of the ſolids, and thereby haſtens the putrefaction of the fluids. As it is evident, by the opening of dead bodies, that the digeſtion is much vitiated, no ſolid food ſhould be given to the ſick animals: but diſſolve rock-alum in bran and water, in ſuch a quantity that the creature may take half an ounce of it in a day; and give, as ſoon as poſſible, the following medicine.

"Take gum-ammoniac and aſſafœtida, of each half an ounce, rub them in a pint of vinegar till they are diſſolved; ſtrain the ſolution, if any dirt be mixed with the gums, and give it as warm as the creature can bear it for ſeveral days only once a day.

"In caſe the ſymptoms are ſo urgent, that there is not time to make the foregoing ſolution, give half a table ſpoonful of volatile ſpirit of ſal-ammoniac, in half a pint of wine, or of infuſion of juniper-berries, and do this three times a day. If

a ſweat breaks out, it ſhould be kept up with an ounce of theriac or orvietan, diſſolved in the ſame kind of vehicle. With this view the animal ſhould be covered, and towards the end of the criſis ſtrongly rubbed down.

" The critical tumours require the utmoſt attention. As ſoon as there is the leaſt appearance of them every means ſhould be uſed to draw them outward. On thoſe which are hard at the bottom, and ſhow no diſpoſition to ſuppurate, cataplaſms the moſt capable of exciting the action of the ſolids, and of increaſing the inflammation in the part, ſhould be applied. Epiſpaſtic or bliſtering applications anſwer this purpoſe.

" Take half an ounce of cantharides, two drams of euphorbium, both in powder, mix them with half a pound of leaven, and vinegar enough to make them of the conſiſtence of a cataplaſm or poultice, which keep twelve hours on the ſwelled part, and repeat it, if the tumour is not in a ſtate to be opened.

" As ſoon as the leaſt fluctuation, or even a ſoftneſs only, is felt, it ſhould be opened, rather with the actual cautery than with a cutting inſtrument; and a knife made red-hot is better than a button-cautery. The tumour muſt be laid open from one end to the other, and as deep as the ſeat of the matter. The wound may be dreſſed with digeſtive and unguentum Ægyptiacum, equal parts of each; and at every dreſſing, that is, twice a day, the part muſt be waſhed with a mixture of one quart of common water, a pint of brandy, and two drams of ſea-ſalt.

" The rotten parts being caſt off, and the ſuppuration become kindly, the wound may be dreſſed with the common digeſtive, made of turpentine, diſſolved in the yolk of an egg, oil of St. John's-wort, and brandy.

"And finally, the bad ſymptoms being all gone, and the wound being nearly healed, it will be neceſſary to give ſome purging medicine, which muſt be repeated *pro re nata*. This may be done with ſafety."

The Royal Society of Agriculture at Paris have likewiſe given an account of a Peripneumony, which conſtantly attacks the horned cattle every year, in the latter end of autumn, and the beginning of the ſpring, in ſeveral parts of France, and particularly in the Franche-Comte. It i known there by the name of *Murie;* and the following is the account given of its ſymptoms.

A dry cough, which at firſt comes but ſeldom, but is afterwards much more frequent; a ſenſible degree of fever; an oppreſſion more or leſs troubleſome, which increaſes when the animal has eaten, and which ſometimes ceaſes, though this is very rare; a diſtaſte to food, which increaſes with the diſeaſe: creatures which chew the cud, ceaſe that chewing; but this ſign is equivocal, becauſe the ſame happens to them in all ſevere illneſſes. A ſtinking breath; a dryneſs of the noſe, mouth and tongue; and ſometimes a diſcharge of matter by the noſe, different in its degree of thickneſs: but the three laſt of theſe ſymptoms do not always happen.

Thoſe which are obſerved in the dead bodies are, a lividneſs and ſtuffing of the lungs, an echimoſis on their ſurface, ſuppurated puſtules, gangrenous ſpots on the ſurface, as alſo gelatinous cruſts of different colours, which adhere ſlightly to it; purulent abſceſſes, the matter of which inſinuates itſelf into and waſtes the lobes of the lungs, ſometimes of one only, and at other times of both; an adheſion to the pleura, which is ſometimes thick, inflamed, ſuppurated, or gangrened; a conſiderable quantity of reddiſh, purulent, putrid,

ſometimes frothy ſanious water is found in the breaſt.

A ſinking, a feebleneſs, a great difficulty of breathing, a continual cough, a redneſs of the eyes, a dryneſs of the tongue, a rattling in the throat, a ſtinking breath, are ſypmtoms of an approaching death; as the being free from them affords hope of recovery.

The moſt common cauſes of this diſorder are, the changes in the atmoſphere from heat and drought to cold continued rains, to which the animals are expoſed; or their being ſuddenly turned out from warm houſes into wet cold air.

The cure muſt begin with bleeding in the jugular, taking a conſiderable quantity of blood, and repeating it on the ſame day, as alſo on the ſecond and third, if the diſeaſe runs high. When the blood does not coagulate, but remains fluid and without coheſion, it indicates that the lungs are then ſo much ſtuffed and obſtructed, that only the thinneſt parts of it can paſs to the heart, and that farther bleeding cannot be of ſervice.

Emollient and refreſhing glyſters given and repeated two or three times a day for the firſt five or ſix days, have very good effects. No ſolid food ſhould be given to the ſick cattle, at leaſt very little, or but juſt enough to ſupport them. The beſt food that can be given them is wheaten flour, either mixed with warm water, or made into balls with honey, and given from time to time. Their drink ſhould be bran and water, with honey diſſolved in it; or an infuſion may be made of the flowers of corn-poppies and violets, of each two handfuls, in boiling barley-water, to which may be added three ounces of honey: this mixture ſhould be added to the former.

Rolls or pellets put into the creature's mouth two or three times a-day will have very good ef-

fects. They may be made of ſix flat figs ſliced and maſhed, with five ounces of common honey and conſerve of roſes; or of four ounces of ſirop of violets, the yolk of ſix eggs, five ounces of roſe-water, and as much flour as to form pellets. Making the ſick creature breathe from time to time the fumes of warm water in ſuch manner that thoſe fumes enter with the air into the lungs, is found to give great relief.

When the cough is very hard, frequent, and greatly fatigues the animal, the following bolus may be given, beſides the addition made to the common drink. Take ſpermaceti and liquorice in powder of each two grains, pillulæ de cynogloſſo one dram, and mix them up with conſerve of althæa into a bolus.

If the fever and oppreſſion abate, the following bolus may be given in the morning faſting. Take agarick in powder, flowers of ſulphur, Florentine iris in powder, of each two drams, and make it into a bolus with honey.

If the ſinking and putridity, the natural conſequences of a great inflammation, ſtill continue, give the following bolus, viz. flowers of ſulphur ſix drams, ſpermaceti two drams, powder of woodlice, gum ammoniac, of each a dram and an half, myrrh one dram, white honey as much as is neceſſary to render them of a proper conſiſtence to be made into two boluſes, to be given at two different times. The Peruvian bark, camphire and honey may be uſed to advantage. To this end, take of Peruvian bark three drams, of camphire one dram, and of ſimple oxymel as much as ſhall be ſufficient to make them into a bolus, to be given in the morning faſting, and in two hours after, one or two hornfuls of a ſtrong decoction of juniper-berries, or of elecampane. In caſe there be a defluxion from the noſe, the following drink may be given,

viz. leaves of periwinkle, of lion's-foot, of fluellin, of ground-ivy, of each a handful, which boil in common water till one third is evaporated, and to the ſtrained liquor add four ounces of honey, to be given at two different times: and now the firſt bolus with the flowers of ſulphur need be given only in the evening. This laſt drink is peculiarly uſeful in that malignant peripneumony which frequently ſpreads among cattle. This diſtemper is, however, not contagious, as ſome have thought it, and is, ſo far as can be judged, that which affected the horſes, poultry, and dogs, in 1764, and again the horſes in particular in 1766.

The cure may be finiſhed by one or two purging glyſters, made as follows. Take leaves of ſenna three ounces, pour upon them two pounds and a half of a boiling emollient decoction, let them infuſe for an hour, ſtrain off the liquor, and diſſolve in it three ounces of catholicon, for a glyſter: but this ſhould not be given till the dangerous ſymptoms have diſappeared, and a chewing of the cud ſhows a return of the ſtomach's being able to do its office in animals which chew the cud.

As the influence of the air is greater in this diſeaſe than in almoſt any other, the ſick creatures ſhould not be expoſed to cold or rain. The buildings in which they are kept ſhould be neither too warm nor too cold, but had better, of theſe two, exceed in coolneſs. The air ſhould be frequently renewed, and if the diſorder is epizonnic, the air ſhould be be fumigated by throwing from time to time a ſmall quantity of vinegar upon live coals.

As to the means of preſerving cattle from it, the ſound ſhould be ſeparated from the ſick, and ſheltered as much as poſſible from the cauſes of the diſorder; a ſmall quantity of blood may be taken from them; they ſhould be kept covered, their

common drink ſhould be bran and water boiled, and emollient glyſters may be given in caſe the leaſt tendency to the diſorder be perceived.

The Royal Society of Agriculture at Paris cloſe their obſervations on particular diſeaſes omitted by Dr. Barberet, author of the Memoir to which they adjudged their prize for the year 1765, and of which the greateſt part of the foregoing is an abſtract, with an account of the dyſentery, a diſeaſe which frequently attacks only particular horſes, and which ſometimes becomes general and even contagious among them. In this laſt caſe, it is always malignant, is conſtantly attended with a fever, in the beginning light, but which afterwards becomes ſo high as frequently to be thought the principal diſeaſe. Its ſymptoms are, ſanious, purulent, bloody ſtools; griping, teneſmus, an enormous heat of the entrails, a falling out of the fundament, &c. together with all thoſe which indicate a fever attended with malignity. On opening the dead bodies, the inteſtines are generally found dry, or dilated with wind, containing a purulent matter, and always with ſigns of inflammation, ulcerated or gangrened: the ſpleen is inflamed and putrid, the rectum eſpecially is in the worſt ſtate of any of the bowels, and clots ſometimes of pure blood, ſometimes mixed with ſanies, are found in it.

If the ſick horſe is not too much ſunk with the diſorder, it is adviſable to bleed him in the jugular. An ounce of oil of olives or of rape, mixed with half a glaſs of wine-vinegar and a glaſs of water, may be given morning and evening. The common drink ſhould be bran-water, with one third of a decoction of burnt hartſhorn: the food ſhould be only barley, oats, or rye, boiled. An ounce of diſaſcordium mixed with bran-water acidulated with vinegar, may be given at times.

Glyſters will be peculiarly beneficial. To this end, take of wheat-bran four handfuls, leaves and flowers of mullein of each one handful, ſeeds of fenugreek and of flax of each half an ounce. The bran, leaves, and ſeeds, ſhould be boiled in five pounds of water to a diminution of one third. At the cloſe of the boiling, the flowers ſhould be added, and let ſtand to infuſe. Two candles ſhould be melted in the ſtrained liquor for a glyſter. In caſe the gripings are violent, a glyſter may be made of the ſame decoction, with, inſtead of the candles, three ounces of ſirop of diacodium, and half an ounce of ipecacuanha in powder. This glyſter has ſurpriſingly good effects. Towards the cloſe of the diſorder, the following deterſive glyſter may be given. Take leaves of millepertius and of periwincle, of each a handful; boil them in the ſame quantity of water as before directed, and to the ſame degree of diminution; and to the ſtrained liquor add two ounces of Venice turpentine diſſolved in the yolks of eggs, for a glyſter.

Nitre and camphire are frequently given with good ſucceſs. Take an ounce of nitre, diſſolve it in two pounds of decoction of ſorrel, and give it at twice with a horn: or, take nitre and camphire, of each two drams, and make them into a bolus with a ſufficient quantity of honey.

The learned and judicious PETER LAYARD, *of* Huntingdon, M. D. *and* F. R. S. *whoſe reſidence in the country, joined to his univerſal humanity, neceſſarily afforded him frequent opportunities to remark the beginning and progreſs of the contagious diſtemper which prevailed among the horned cattle in Great-Britain a few years ago, particularly from about the year* 1765 *to* 1770; *being then applied to by government for his advice, gave the following as the reſult of many carefully repeated obſervations he had made on that melancholy occaſion.*

SYMPTOMS.

"THE firſt appearance of this infection is a decreaſe of appetite; a poking out of the neck, implying ſome difficulty of deglutition; a ſhaking of the head, as if the ears were tickled; a hanging down of the ears, and deafneſs; a dullneſs of the eyes; and a moving to and fro, in a conſtant uneaſineſs. All theſe ſigns except the laſt, increaſe till the fourth day: then enſue a ſtupidity and unwillingneſs to move, great debility, a total loſs of appetite, a running at the eyes and noſe, ſometimes ſickneſs and throwing up of bile, a huſky cough, and ſhivering. The fever which was continual the three firſt days, now riſes, and increaſes towards the evening: the pulſe is all along quick, contracted, and uneven. A conſtant diarrhæa, or ſcouring of fœtid green fæces, a ſtinking breath, a nauſeous ſtream from the ſkin, infect the air in which the morbid creatures are placed. Their blood is very florid, hot, and frothy: their urine is high-coloured: the roof of the mouth and the barbs are ulcerated. Tumours, or boils, are to be felt under the fleſhy membrane of the ſkin;

and eruptions appear all along their limbs, and about their bags. If a new milch-cow is thus ill, her milk dries up gradually, her purging is more violent, and on the fourth day ſhe is commonly dry. There is ſuch ſharpneſs in the dung of the diſeaſed, that a viſible irritation is obſerved during ſome time in their fundament. They groan much, are worſe in the evening, and moſtly when they lie down. Theſe ſymptoms continue increaſing till the ſeventh day, on which, generally, though ſometimes protracted till the ninth, the criſis, or turn, takes place.

" Bulls and oxen are not ſo violently attacked as cows and calves; and of theſe, cows with calf, and weakly cow-calves, are in the greateſt danger.

" If a cow with calf, at the critical time of this diſeaſe, ſlips her calf, ſhe then takes her fodder, and recovers. Some may only give ſigns of ſuch abortion, and bear their calf ſeveral days, nay even weeks, before they ſlip it, and yet recover. Calves receive the infection from the cow, by ſucking her milk; and may alſo, if firſt ſeized, infect the cow.

" This diſeaſe takes place at all times and ſeaſons: but in ſummer and autumn it will rage moſt. The fate of the beaſt is generally determined on the ſeventh day from the invaſion; though it has been ſometimes delayed till the ninth.

" If eruptions appear all over the ſkin, or boils as big as pigeons' eggs in different parts of the body, but eſpecially from the head to the tail, along each ſide of the back-bone, and ſo ripe as to diſcharge putrid and ſtinking matter; if large abſceſſes are formed in the horns, or in any part of the body; if the dung is become more conſiſtent and firm; if the urine is thick, and not quite ſo high coloured as before; if the beaſt has had a

ſhivering ſucceeded by a general glow of heat, upon which the fever has abated, and the pulſe beats regularly; if the noſe be ſore or ſcabbed; if the eyes look bright and briſk, and if the beaſt pricks up its ears upon a perſon going into the hovel, and will eat a little hay or peas; theſe ſymptoms will determine that the creature is out of danger.

" But if, on the ſeventh day, the eruptions, or boils, are decreaſed in bulk, or have totally diſappeared without having broke or diſcharged outwardly; if the ſcouring continue almoſt conſtantly; if the breath be very hot, while the whole body, limbs, and horns are cold; if the groaning and difficulty of breathing are increaſed; if the running from the noſe and eyes is leſſened; if the eyes are dim, and ſunk into the head, with a perfect ſtupidity; if the urine is dark coloured, the pulſe intermitting, and a cadaverous ſmell is obſerved; we may aſſuredly pronounce the creature to be near its end.

" Ramazzzini's emphyſema was met with.

" All the carcaſſes that were opened appeared extenuated by the ſcouring. Upon opening the ſkin much ſtinking air ruſhed out, and ſometimes a purulent and ſanious diſcharge. The veſſels of the brain were turged, and filled with blood of a very red colour and looſe texture; the ventricles filled with water. The membranes of the noſe, the glands, the whole extent of the frontal ſinus, and the pith of the horns, were highly inflamed, ulcerated, and full of ſmall abſceſſes. There was the ſame appearance in the mouth and about the glands of the throat. The lungs were inflamed with livid ſphacelated ſpots, here and there loaded with hydatides; and the cellular texture was frequently diſtended with air. The heart was large, flabby, and dark coloured, containing in its ventricles clots of

black blood, of a very looſe texture, without ſerum; the fat about it was of a bright yellow. The liver was large: its blood and biliary veſſels were fully extended with dark fluid blood, and very deep coloured bile: the ſubſtance of the liver was ſo rotten, as to ſeparate on the leaſt touch. The gall-bladder was ſtretched to a great ſize, and full of greeniſh bile. The æſophagus was ulcerated in ſome. The paunch was diſtended with air, flabby, and contained a large ſubſtance like a dried turf, conſiſting of fodder hardened to that degree. There were ſeveral appearances of gangrene on all the ſtomachs. The honeycomb had no fluid in it, but ſome pappy fodder. The manyfold contained between its plaits, a great deal of dried fodder, which clung to their ſides. The rennet-bag was empty, but highly inflamed, and gangrened in ſeveral places. All the inteſtines were empty, and were beſet with red and black ſpots. The kidneys and bladder were large, without urine. The kidneys were of a looſe texture, eaſily torn. The fleſh in ſome was livid, in others of a lively red; but it ſoon turned green. The fat that remained was of a bright yellow. In ſuch cows as were with calf, the uterus was gangrened in ſeveral places, and the water included in it ſtunk moſt intolerably. The virulence of the diſeaſe appeared to have ſometimes fixed itſelf on the vital part, and ſometimes on another, and frequently in more places than one.

To CURE.

"The beaſts ſhould be kept in well-aired houſes and be plentifully bled from two quarts to one, according to their age and ſtrength. They ſhould be waſhed with warm water and vinegar, to clear the ſkin from filth, and be frequently rubbed,

which affords them much pleaſure, as well as benefit. A rowel ſhould be made as ſoon as poſſible in the dewlap, and it ſhould be kept open for ſome time after the cure. If the dung be hard, a cooling purge ſhould be given, and plenty of anti-ſeptic drinks, ſuch as bran-water, vinegar, bitters, ſalt; but no hay till they chew the cud. The mouth, barbs, and noſtrils, ſhould be waſhed carefully and frequently. If a purging comes on by the fourth day, it ſhould be checked by warm medicines proper to throw the morbid matter off by the ſkin, ſuch as ſnake-weed, and other warm plants, or Venice-treacle, with which Mr. Montgomery* cured ſix beaſts out of ſeven. If the colour of the mouth becomes dark, the creature cold, the dung black and fœtid, and the diſcharge from the mouth and noſe ſanious, an ounce of Jeſuits'-bark, or oak-bark, with ſnake-root, or other warm ingredients, ſhould be given every four hours, to prevent mortification. If matter is formed in the horns, or any other part of the body, an opening ſhould be made there, as alſo in the emphyſema, and digeſted by warm applications. If a purging does not come naturally after the criſis, the bowels ſhould be emptied with a ſmart purge, after which a draught of warm ale may be given at night. On recovery, the beaſts ſhould be gradually expoſed to cold air, and by degrees habituated to their uſual food."

* One of the Doctor's neighbours in the country.

INDEX.

A.

ÆGAGROPILE, what, and why found only in the maw of cattle, 38.

Air, (the) is the great ſource of contagious diſtempers, and means of ſpreading them, 151—154. Dr. Le Clerc's method of inveſtigating the qualities of the air, 159. Means of purifying the air, and guarding againſt its bad effects, 175.

Antimony. An antimonial powder for ſheep, 99. Antimony, and its preparations, recommended for the meaſles in ſwine, 128.

Appoplexy, in ſheep, 103.

Aſſes, Deſerve greater eſtimation than we commonly hold them in, 1. Remark on their manner of drinking, 3. On their braying, 5. How taught to amble, 4. How to know their age, 6. At what age capable of generating, *ibid.* Time of geſtation, *ibid.* Aſſes milk, 7. Requiſites in a good ſtallion aſs, *ibid.* Probable origin and diſperſion of theſe creatures, *ibid.* High value ſet upon fine aſſes in Spain, 8; and in Auvergne, *ibid.* Duration of their lives, 9. Are ſubject to few diſeaſes, *ibid*; and how thoſe are to be treated, *ibid.*

B.

Barbaret, (Dr.) his memorial concerning the contagious diſeaſes of cattle, 129, *et ſeq.*

Bleeding, directions how to bleed a ſheep, 104.

Borel, (Mr.) his remarks on the ſmall-pox in ſheep, 143—149.

Buffon, (M. *de*) his remarks on quadrupeds, and their different manners of drinking, 4. On their voices, 5. On their manner of feeding, 38. His account of an uncommon ſort of worms found in the livers of ſheep, 106.

Bull, (the) character and principal uſe of, 21. When and how moſt properly gelded, 22. Deſcription of a good ſtallion bull, 40.

Burnet, the excellency of, for the food of ſheep; particularly for curing them of the rot, 77, 106.

C.

Calf, (a) how to be managed from the time of its birth till it is fatted for ſlaughter, 43. How fatted ſo as to render its fleſh moſt delicate, *ibid.* What calves the beſt for bringing up, and how to manage them, *ibid.* Reaſon why a calf is ſometimes unwilling to take the teat, and how to remove the cauſe of that reluctance, 44.

Carrots, why a better food than turnips for oxen, 35. Are an excellent and profitable food for ſheep, 78.

Clover, cautions to be obſerved in the feeding of cattle with, 37; and the ſame of ſheep, *ibid.*

Contagious diſeaſes of cattle, (the) have unfortunately been but imperfectly treated of by the antients, 130. Ramazzini's account of that of Modena, in the year 1690, which appears to have been the ſmall-pox, and the then ſtate of the air, *ibid.* That of Heſſe in 1693, a conſumption of the lungs, and the conſtitution of the air, 131. The dreadful diſeaſe in Hungary in 1712, imputed chiefly to the very ſudden and extraordinary changes of the weather, 132—133. Symptoms, dreadful effects, and ſuppoſed cauſe of the epidemic which deſolated Italy and Germany from 1711 to 1714, under the appearance of a malignant dyſentery, 134—139. Uncertainty of the natures of the diſeaſe which carried off vaſt numbers of cattle in Bohemia, Lithuania, Saxony, the Marche of Brandenburgh, and the Dutchy of Magdeburgh, in 1730, 139. Symptoms and effects of that which ravaged France in 1731, *ibid.* Of that which deſolated all Europe from the year 1740 to 1750, deemed a putrid, malignant, inflammatory fever, *ibid.* Cauſes and effects of the epidemic in Minorca, in 1756, 140. Particular account of that which broke out in Denmark, and

ſpread from thence in 1762, *ibid.* Obſervations and experiments on the ſmall-pox in ſheep, which killed prodigious numbers of theſe creatures in France in the years 1746, 1754, 1761, and 1764, 143—148. Inquiry into the cauſes of the contagious diſeaſes of cattle, 151—158. And how to treat them according to the appearances they have hitherto aſſumed, viz. either inflammatory or putrid, 162—170. General means of guarding cattle from infection, 174, 181, 183. Symptoms of, and ſucceſsful manner of treating the diſeaſes which prevailed among the horned cattle in France in 1762 and 1763, 183—205. Symptoms, effects, and cure of the peripneumony in cattle, 205—210. Symptoms and cure of the late contagious diſeaſe among the horned cattle in Great-Britain, 211, 215.

Cotes, for ſheep, the utility of, and how to be conſtructed, 81—86.

Cough, (a) cauſe, effects, and manner of treating, 104.

Cow, (the) may be rendered, and how, fit for the labours of huſbandry, 20. The *free-martin* cow, what, 21. Which are the cows that generally yield the moſt milk, 26, 27. Uſual ſeaſon, and ſure marks of a cow's being in heat, 39. Deſcription of a good breeding cow, 40. How to be managed whilſt pregnant, at the time of parturition, and after ſhe has brought forth, 41.

D

Dairy, ſome general obſervations concerning dairies, 45.

Dropſy, (the) in a ſheep, 107—110.

E

Ewe, qualities of a good one for propagation, 91. Treatment of her before and after copulation, 92. Time of geſtation, *ibid.* Cares requiſite in her yeaning, 93. Uſes of her milk, 94. How long capable of yeaning, *ibid.*

F.

Folding of ſheep, the utility and manner of, conſidered, 80. Benefits of a covered fold, 82.
Food, the bad qualities of, a cauſe of many epidemic diſeaſes, 154. Inſtanced in ſeveral caſes, 155—156. Means of guarding againſt its bad effects, 176.

G.

Gelding, when and how moſt properly performed on a bull, 22. On lambs, 90. On pigs, 123.
Goats, the nature of, 111. When capable of engendering, 112. How to be choſen for propagation, 113. Time of the female's carrying her young, *ibid.* Neceſſity of ſometimes helping the female when ſhe yeans, *ibid.* How eaſily fed, *ibid.* Danger of their getting into cultivated grounds, 114. Will readily copulate with ſheep, *ibid.* Love the hotteſt climates, but cannot endure damp places and rich paſtures, *ibid.* Age to which they will breed and live, 115. How fatted, quality of their fleſh, and cauſe of its ſtrong ſmell, *ibid.* Marks of their age, 116. Their utility when dead, *ibid.* Goat's milk frequently an excellent medicine, *ibid.* The breed of goats far more extenſively ſpread than that of ſheep, 117.

H.

Haſtſer (Mr.) his directions for the building of ſheep-cotes, 82—83. His ant-powders and drying-powders for ſheep, 97. Receipts for the dropſy in ſheep, 108—110. Method of treating the ſmall-pox in ſheep, 174.
Horns, (the) of an ox, how denotive of his age by their growth, 23, 24.
Hoving, in cattle, the cauſe of, and cure, 51. And in ſheep, 78.

I.

Indigeſtion, in cattle, the ſigns, danger, and cure of, 50.

K.

Kidneys, (the) reaſon why the kidney on the left ſide of an ox is always larger than that on the right ſide, 22.

L.

Lamb (a) how to be managed from the time of its birth till it is fit for weaning, 93. When and how moſt properly caſtrated, 90.

Lanciſi's account of the dreadful epidemic diſtemper which raged in Italy and Germany, from the year 1711 to 1714, and of the means by which Pope Clement XI. put a ſtop to it, 135—139.

Layard, Peter, M. D. F. R. S. his account of the ſymptoms and cure of the late contagious diſtemper among the horned cattle in Great-Britain, 211—215.

Lead, unfit to keep milk in, and why, 45.

Le Clerc, (M.) his method of inveſtigating the qualities of the air, and thereby judging of the nature of contagious diſeaſes, 159.

Liver, the appearance of, in ſheep that have the rot, 105.

Lucerne, is the beſt of plants for fattening oxen, and how moſt properly uſed for that purpoſe, 37. The ſame for ſheep, 78.

M.

Meaſles, (the) in ſwine, cauſes of, and how to be treated, 128.

Milk, the qualities of good, 42, *n.* *. How moſt properly kept in a dairy, 45. Uſes of ewe's milk, 94. And of goats, 116.

Mouth, (the) general diſorders of in calves, 44. Of oxen, 52.

Mules, how bred, 10, 11, 12. Do they themſelves ever breed? *ibid.* Their qualities and uſes, 12. Which ſorts reputed beſt, 14. How fed and managed, *ibid.*

N.

Nicolau, (Dr.) his ſucceſsful treatment of great numbers of infected cattle, 188—205.

O.

Oſmer, (Mr.) his opinion of the late contagious diſeaſe among the horned cattle, 49.

Ox, (the) character and uſes of, 15. Why thought to be in general, preferable to the horſe for ploughing; with directions how to harneſs oxen for drawing, 16—17. Remarks on the ſleep of horned cattle, 22. How to know the age of an ox by his teeth, 23. And by his horns, *ibid.* Marks of a good one for the plough, 24. At what age, and how, moſt properly broken for labour, 25. When to be ſhod, or cued, *ibid.* Age to which an ox ſhould be made to work, and after which he ſhould be ſlaughtered, *ibid.* What kind of climate thought to be fitteſt for black cattle, 26—46. Which the beſt ſort in Great-Britain, 27. Reaſon why large beef is moſt eſteemed for ſalting, eſpecially for the uſe of the navy, *ibid.* Cauſe of the difference between the manner of feeding of the ox and that of the horſe, 28. Caution to be obſerved in the paſturing of black cattle, 32. Reaſon why they never over-eat themſelves, and therefore need not have their food meaſured out to them, 33. What ſorts of food proper for them, *ibid.* Propriety of mixing ſalt with their fodder, *ibid.* Frequent currying and rubing them down recommended, 34. And the cuſtom of leaving them continually out of doors blamed, *ibid.* At what age, and how, beſt to fatten them, 35. Sorts of food fitteſt for this purpoſe, and the length of time required for it, *ibid*—36. How to know when a beaſt is well fleſhed, and when ſufficiently fatted, 37, 38. Some directions concerning their ſtabling, food, drink, and exerciſe, 46, 47. How to be treated when they have ſwallowed any improper thing, 47. In caſes of indigeſtion, 48. And when hoved, or ſwelled, 51.

P.

Parſley, the excellency of, for ſheep, 78, 107.
Parſnips, excellency of, for the food of cattle, and eſpecially of milch cows, 35. For ſheep, 79.
Peripneumony, cauſe, ſymptoms, effects, and cure of in cattle, 205—210.
Pimples in the mouth of an animal, how to cure, 44, 52.
Plague, effects of the, on water, 158. Remarkable inſtance of its lying dormant a very long time, and yet retaining all its ſtrength, 182.
Powder. Ant-powders, drying-powders, and Pomeranian-powders, for ſheep; how made and adminiſtered, 97, 98.

Q.

Quadrupeds, their different manners of drinking, 3. And of eating, 38. Remarks on their tones of voices, 5.

R.

Ram, requiſites in a good one for breeding, 91. One will ſuffice for twenty-five or thirty ewes, *ibid.* How long fit for propagation, and what the duration of his life, 94.
Rennet, what, and where found, 45.
Rot (the) in ſheep, cured by their eating burnet, 77, 106. Manner in which this diſeaſe affects their liver, 104. What, probably, the beſt manner of treating it medicinally, 105.

S.

Scab (the) or itch, a contagious diſeaſe in ſheep, cauſes of, ſymptoms, and methods of cure, 100, 102.
Sheep, general character and properties of, 53. Have been on the decline for ſome time paſt in Great-Britain, with reſpect to their wool, 54. Peculiarly happy ſituation of that iſland for raiſing flocks of ſheep, 55, 79. Origin of the fine breed of ſheep in Spain, 56. Means by which it is ſaid Britain firſt obtained a fine breed of theſe animals, 57. What parts of Great Britain now moſt famous for ſheep, 56, 59. Some account of the Spaniſh ſheep, of the management of them, and of their produce, 66—75. What grounds and ſituations beſt for ſheep, 55, 75. Sheep are remarkably fond of, and benefited by, the milfoil or yarrow, 76. Cured

of the rot by feeding on burnet, 77. Well fed with lucerne, 78. Cautions to be obſerved when they feed on clover, *ibid.* How to correct the inconveniences which may ariſe from their feeding on turnips, 79. Carrots and parſnips excellent and profitable food for them, *ib.* How, and when moſt proper to lead them to paſture, 80, 88. Are benefited by being in the open air, but ſhould not ever be laid wet, 81. Directions how to houſe them in very ſevere weather, 82. When, and how to ſhear them, 87. Reaſons why the flock ſhould be examined every year, 88. How beſt fattened, 89. Cannot be fattened a ſecond time, *ibid.* When and how beſt to caſtrate lambs, 90. Remarks on their fat and ſuet, *ibid.* Qualities requiſite in a good ram and in a ewe for breeding, 91, 92. Yeaning of the ewe, *ibid.* Rearing of lambs, 93. Uſes of ewes' milk, 94. Age to which ſheep may live, *ibid.* General cauſes of their diſeaſes, 95. Remedies recommended for ſome of them, particularly ſuch as proceed from too much wet, 96, 97. Methods of treating their cutaneous diſeaſes, 101, 102. Diſeaſes of the head and throat, 103. Coughs and ſhortneſs of breath, 104. Diſeaſes of the belly, 105. Of the liver, 106, 107. The dropſy, 108—110. No animals ſo ſubject to the ſmall-pox as ſheep are, 131, 142, 143. How to be treated in it, 170—174.

Shepherd, qualifications requiſite in a good, 65—95.

Small-pox, a moſt dreadful diſorder in ſheep, 131—143. Inoculating it in them conſidered, 149. How to treat it in them, 171—174.

Spurry, recommended for the food of cattle, and eſpecially of milch-cows, 36.

Stable, (a) how moſt properly conſtructed for oxen, 46, 47.

Swine, the character of, 118. Why the moſt profitable animals that an inhabitant of the country can rear, 120. How fed, 121. And how fatted, 122. At what age, and in what weather moſt proper to caſtrate them, 123. At what age fit for propagation, 124. Time of the ſow's going, *ibid.* Wild ſows farrow but once a year, but tame ones twice, 125. General way of diſpoſing of their pigs, *ibid.* Names given to the wild boar according to his age, 126. Some cir-

cumſtances relative to hunting of the wild boar, 120, *n.* *. Age to which ſwine may live, 127. Their vaſt increaſe all over the world, *ibid.* How to treat the only diſeaſe that ſeems to be peculiar to them, namely, the meaſles, 128.

T.

Teeth, (the) ſhow, and how, the age of an ox, 23.
Throat, general diſorders of, in ſheep, 103.
Tumours, the ſeveral ſorts of, enumerated and deſcribed, and how moſt properly treated, 103.
Turnips, good food for oxen; but ſhould be ſliced, and why, when given to cattle, 35. How to correct the inconveniences of their too-great moiſture, when given to ſheep, 78.

V.

Ventilation of water recommended, in order to purify it, 177, 178.
Vertigo in ſheep, cauſes and treatment of, 103.

W.

Water, hail-water thought to be very pernicious, 72, *n.* *. Water may contribute greatly, and how, to the production of epidemic diſeaſes, 158, 159, 177. Methods of purifying water, 178.
Wool, the Britiſh has been on the decline for ſome time paſt, in regard to its quality, 51. The ſeveral ſorts of Spaniſh wool, and which moſt eſteemed, 55, *n.* *. Nature and qualities of the Iriſh wool, 59. Of the Dutch and Flemiſh wool, 60. Of the Swediſh wool, 61. Of the French wool, *ibid.* Of the Italian wool, 62. Of the German, Poliſh, Ruſſian, and Tartarian wools, 63. Proofs how far the nature of wool may be affected by the climate of a country, *ibid.* The wool of North-America ſaid to be in general better than the Engliſh, 64, *n.* *.
Worms, an extraordinary ſort of worms found in the livers of ſheep, 106.

Y.

Yarrow, or milfoil, an excellent food for ſheep, and highly pleaſing to them, 76.

FINIS.

1371