FIRST LINES

OF

VETERINARY PHYSIOLOGY

AND

PATHOLOGY.

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AND

PATHOLOGY.

BY

JAMES CLARK,

FARRIER TO HIS MAJESTY FOR SCOTLAND, AND VETERINARY PROFESSOR EDINBURGH.

VOLUME FIRST.

Sicut animalia post hominem, ita ars
Veterinaria post medicinam secunda est.

Vegetius.

EDINBURGH:

PRINTED FOR AND SOLD BY THE AUTHOR,
AND ALSO SOLD BY W. CREECH, W. LAING, MANNERS AND MILLER, AND J. ANDERSON; AND BY CADELL AND DAVIES, LONGMAN AND CO. CUTHILL AND MARTIN, AND J. MURRAY,
LONDON.

1806.

Entered in Stationers Hall.

TO THE

RIGHT HONOURABLE

HENRY DUNDAS,

LORD VISCOUNT MELVILLE,

THE FOLLOWING TREATISE

IS INSCRIBED,

AS A MARK OF RESPECT AND ESTEEM,

BY HIS LORDSHIP'S

MOST HUMBLE

AND MOST OBEDIENT SERVANT,

THE AUTHOR.

PREFACE.

The following Essays, or First Lines of Veterinary Physiology and Pathology, are short Extracts from the Lectures which were composed in the years 1793 and 1794, on the prospect of a Veterinary School being established at Edinburgh, under the direction of the Author; but, from the political situation of the country at that time, did not take place. This school was to have been patronized by some of the first noblemen and gentlemen of the country; and, at the same time, the Author had the fullest assurance of the countenance of Government for its aid and support. For which reason, he declined the offer then made to him by the Directors of the

the Veterinary College at London, of standing a candidate for the then vacant Professorship, by the death of M. St. Bell their first Professor.

THE Author anticipated the many advantages that would be derived from an institution of this kind in Edinburgh, from its vicinity to an University so justly famed for the celebrity of its medical and surgical Professors, and attended by a numerous concourse of Medical Students from all parts of Europe; that, whilst many of them were attending other branches of medical education, some might be induced to attend the Veterinary Class. The many advantages arising to the science from this circumstance alone, of being studied by men who had the advantage of a liberal education, would have been the surest means of improving the art, and of disseminating veterinary knowledge throughout the kingdom in a highly improved state.

ANOTHER

Another circumstance of equal importance attending a Veterinary School at Edinburgh, is, that young men who propose to follow the operative branch of shoeing horses, and indeed mechanics in general, get a better or more liberal education in this country, than their more southern brethren of the same professions in England.

Till lately, no attempts have been made in Great Britain to improve the Veterinary art, by affording men of this profession proper opportunities of acquiring instruction, of course the art has been depreciated,—its Professors derided for their ignorance, and prevented from attaining that rank in science to which they are entitled. This neglect, and the consequent deficiency of sources of instruction, still compels them to continue in that old track handed down to them from father to son, now so generally and so justly condemned; and no set of men have hitherto valued less the theoretical part of the art they profess, or followed more implicitly the prac tice of their predecessors, without inquiring why they did so, merely from the want of better information.

However, from the Veterinary College established in London, much improvement is now looked for in this branch of neglected science, and which has undoubtedly proceeded from the more general cultivation of all the different sciences in the present age. We may, therefore, anticipate the happy effects of the continuance of that spirit of improvement; and, although its progress may be slow amongst the present practitioners of the old school, who have imbibed prejudices in favour of their old practices, yet they, by proper instruction, and warned of the danger arising to their patients from adhering to improper practices and improper prescriptions, might be induced to follow more rational methods of cure, when pointed out to them. The young pupils, free from those prejudices already mentioned, will naturally adopt such precepts as were recommended

recommended to them for regulating their conduct in their future practice.

BUT still there is a want of more seminaries for instructing pupils in the Veterinary Art; schools for that purpose ought to be more generally dispersed over the kingdom. Few pupils are able to afford the expence of attending the Veterinary College at London, during the time that is necessary to complete their education,—means of instruction ought to be afforded them nearer their homes. For this purpose, Veterinary schools ought to be established in the principal cities and county towns over the kingdom; it is a national concern, or at least ought to be. The advantage arising from it would soon repay the community. By this means, the young beginners would have the opportunity of being properly instructed, and at a very small expence, as it would not carry them far from home; the means of instruction rather coming to them. In all these schools, the Veterinary Art should be extended to other domestic

domestic animals beside the horse. They ought to include the diseases of cows and sheep, as a very great number of these animals are lost annually merely from the gross ignorance of those who take upon them the cure of diseases to which they are liable. Unfortunately, many of the diseases of cows in particular, are, by the weak and credulous, still imagined to be the effects of witchcraft, &c. To root out the above prejudices, and endeavour to establish a more rational practice in the country, is certainly an object worthy of attention, and ought to be supported with all the influence of the Board of Agriculture, as the means of preserving the farmer's stock is of equal importance with improving his breed of cattle. A diversity of schools throughout the kingdom would create an emulation amongst the masters to excel or rival one another, by stirring up a spirit for improving the art they profess.

One great bar to the farther improvement of the Veterinary Art, is the want of books of instruction on the rudiments or first principles

ciples of the profession; as all the authors who have wrote on the Veterinary Art previous to the institution at London, (Snape and Gibson's Anatomy of the Horse excepted) may be considered rather as compendiums of the formulae of medical prescriptions that are recommended by the Authors, when such diseases as they describe are actually known and ascertained to exist in the patient at the time; of course, such writings are only of use to the already learned, and can convey no information to the young beginner. To ascertain the real seat of a disease in a mute patient with precision, is the great difficulty in the Veterinary Art; it requires not only experience but great abilities, judgment, and penetration, as no information can be got from the patient where his ailment lies. Here a knowledge of the structure of the body, and of the uses and connection of the different organs, assisted by a well grounded medical theory, will lead the practitioner to the deduction of general principles, from particular symptoms before him, and apply them to the case of his patient. This will lead to a

knowledge

knowledge of the true seat and nature of the disease, and point out the proper remedies.

But, farther, those authors, who have hitherto treated on Veterinary subjects, have wrote, as has been observed, for the learned only, and to understand them requires more medical knowledge than the reader may possess. They likewise introduce the reader very abruptly to the practice of physic at once, without that previous knowledge so essentially requisite in the different branches of medical science in order to enable him to comprehend the subject treated upon. They therefore tend to perplex and embarrass the reader, and to promote that spirit of quackery, already too prevalent in Veterinary practice, whilst at the same time it puts a stop to all investigation from individual practitioners, in searching into the nature and causes of diseases, or the proper means of cure; and, as the remedies prescribed in these books are too frequently held out as specifics for every disease on which they treat. For the same reasons, it

will

will be obvious that the Veterinary pupil can reap no advantage from the perusal of these books, unless he is previously made acquainted with the first principles of his profession by a master.

WITH respect to the virtues of medicines, or the effect they may, or ought to produce in the different cases of his patients, the young beginner ought to study the Materia Medica, where he will find the virtues of each described.

THE Author has, therefore, departed from the usual method observed in Treatises upon the Veterinary Art, which always assume, or take for granted, that the first principles of the science are known to the reader, when, in fact, the pupil or the reader should never be so much as supposed to know them, till they have been sufficiently explained by the master. The same Authors likewise make use of a variety of scientific terms, which they have neither explained nor defined, and suppose, or take it for granted, that they are already

already known by the pupils they are only beginning to instruct.

MANY obstacles present themselves to the majority of veterinary practitioners at present, who ardently wish to improve themselves in their profession, if the means were within their reach. Besides, to become acquainted with that branch of science only which relates to their own profession, or which may be intimately connected with it, requires, at the same time, a knowledge or acquaintance with the general principles of other sciences, of which they can acquire no information, unless they are pointed out to them by masters. Hence the utility of public lectures, as that is the easiest and only method by which a general knowledge of any science can be obtained, where a number may be instructed at one time as easy as a few.

THE familiar style in which public lectures ought to be delivered, recommend that method in particular as the only or most convenient

convenient mode of teaching the elements of every branch of learning, and conveying instruction to the young and unexperienced in science: When this is done properly, it awakens the attention of the student; it abridges his labour; guides his inquiries; it relieves the tediousness of private study; and impresses on his mind the principles of science. For the trouble of listening only, he acquires that information that has been drawn from numerous sources, and he becomes possessor of the result of long continued and severe study of the master.

PUBLIC Lectures on the Veterinary Art would soon banish those absurd practices that at present prevail, and remove those prejudices to what the illiterate ironically call Book Learning, and awaken in them a desire to search farther into the subject. As they advance in knowledge, new objects would present themselves, and augment their ardour for farther research and improvement. By this means, many of those practitioners, who may be said to be of the old school, and averse to study, and who by no other means could have been induced to follow out a long chain of reasoning from books they do not understand, would be led step by step to the knowledge of general principles, and obtain a rational knowledge in the art they profess.

The Author, from his own experience, aware of the many difficulties the Veterinary pupil labours under on his first outset and beginning to study, from the want of a proper guide or help to make him acquainted with many of the terms that are used by medical writers; he, therefore, proposes, by way of introduction to his First Lines of Veterinary Physiology and Pathology, to give a short definition*, or rather a short description

* These definitions were intended to have been printed separately, and given to those pupils who attended the Veterinary Class at Edinburgh, as a pocket manual, to have recourse to occasionally.

tion of some of those terms that are used in the different branches of Medical Science; that when such terms occur either in lectures or in reading, the young pupil may have some idea not only of the meaning of these terms, but likewise the general use to which they are applied; so that, by these helps, he may acquire a facility in reading medical books, and have a ready comprehension of the meaning of the Author he consults. This will smooth the road to farther instruction, till, in the course of his studies, he is more fully and more particularly informed.

THESE definitions, to the already learned, may be considered as superfluous and unnecessary; but to the unlearned beginner, just entering on his studies, and for whose use they are chiefly intended, they will prove of singular service, and remove in them one great obstacle to the study of a subject which they could not otherwise understand or comprehend. It will afford them, as it were, a

key

key to open their minds for instruction; and from attention and perseverance, the definitions will become familiar to them.

THE only apology that can be made for entering so minutely into the rudiments of the Veterinary Science, is from an ardent desire to render the study of it easy and accessible to that class of men who make choice of this profession, and who, in general, from their station and situation in life, cannot be expected to have got what may be called a very liberal education.

THE very nature of this profession, as operative Farriers, who must work at the forge, and who must undergo great bodily fatigue, and even hazard to their persons, in the execution of the duties of their office, has consigned this employment, from the most remote times, into the hands of men of athletic habits, capable of such exertions, and, for that reason, must be continued in the same channel. It is this useful class of men,

wherever

wherever they are, whither in cities, towns, or villages, that must be taught and instructed in their profession in a regular and scientific manner. For, as I have just observed, in their hands this branch of the healing art will continue in spite of every endeavour to the contrary. No doubt, in great cities, in great towns, and in the army, men eminent in the Veterinary Science, and who have been taught it in a regular manner, will find employment, without attending to the more laborious branch of the profession, yet still the unavoidable connection between the operative branch of shoeing horses, and the scientific branch of curing their diseases and lamenesses, must, and will continue to give the operative farrier and country practitioner, a preference in the more distant parts, especially where these animals are bred and reared, and whose lives, in cases of disease, &c. must be intrusted to their care.

WHAT was Surgery about a century ago? It was then consigned into the hands of men much more illiterate than Farriers are in this enlightened age. To the hands of ignorant Barbers, and which is the case still in many parts of Europe; the great perfection to which that art is now arrived, is entirely owing to its being properly cultivated as a science.

LET the young Veterinarian have the same opportunities of instruction as the Physician and Surgeon,—his profession requires it. For, the only difference between these occupations, is the subject each of them have to act upon, as the diseases of animals must ultimately be cured on the same principles as those of the human body.

UPON the whole, to the intelligent and observing, there cannot remain the least doubt of the practicability of what has been suggested. The means of putting it into execution must be left to those who have it in their power to promote whatever relates to the

the interests of society; humanity requires that we should pay every attention in our power to relieve or to mitigate the distresses of those domestic animals who too frequently undergo a deal of unnecessary misery from their services to man, and to which they would not be subjected in that state in which Nature has placed them.

The plan adopted in the following Treatise on Veterinary Physiology and Pathology, is taken from the most modern writers on that subject on the human body, adapting its precepts and principles, where necessary, to the structure and economy of domestic animals; and the Author flatters himself, that it may serve for a foundation in its kind, of a rational and regular practice, not only to those who have been previously instructed in anatomy, but to those who have not had these advantages, or a less liberal education; and to those who have had all the advantages of a liberal education and instruction in the Veterinary Art, it may supply

ply the place of a remembrancer, or a recapitulation of what they have been taught in a better and more difused manner.

It is hoped that those readers, for whose benefit the following Treatise is principally intended, that is, beginners and the unlearned, will find their account in having the use and connexion of the different organs in the body explained, together with the diseases such organs are most liable to, as this will have a tendency to render their ideas of the nature and seat of diseases more clear and comprehensive, and to imprint the rational indications of cure more deeply in their minds, and likewise to evince the close connexion between the theoretic and practical parts of medicine.

The Author has endeavoured to be more particularly full on those heads which are most important, and in those cases which occur most frequent in practice, attended with the greatest danger to life, and soundness of the extremities,

tremities, and which have the nearest reference to rational practice.

Averse to ostentation or parade, the Author will avoid all pomposity of language, and endeavour to express himself with as much clearness and perspicuity as possible; nor will he attempt to swell his pages by illiberal criticisms on dead or living Authors, who have wrote on the Veterinary Art; nor will he suffer himself to be led away from his subject, by making unnecessary digressions not connected with the subject, but always having in view the instruction of the young beginner, and the improvement of the Veterinary Art.

Those who are versant with works of this kind, will readily admit of the difficulties attending its composition; and although this cannot be urged as an excuse for its errors, yet the Author hopes it will operate in obtaining a candid and indulgent criticism, as his endeavours, however weak, proceeds from an ardent desire to improve Veterinary Science.

The greater part of the following sheets were printed three years ago, when unfortunately the publishing of them was interrupted by a violent disorder in the Author's eyes, which terminated in a cataract in one of them, and which has happily been extracted with the greatest sucess, by that eminent surgeon and oculist, James Ware, Esq; of London.

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* N. B.—The second volume is in great forwardness; and will be published with the utmost speed.

CHAP.

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CHAP.

A TREATISE ON *VETERINARY PHYSIOLOGY* AND PATHOLOGY.

TO WHICH IS PREFIXED, ARRANGED ALPHABETICALLY,

A Short Definition of ſome of the TECHNICAL TERMS *uſed in the different branches of Medical Science*;—*being a neceſſary Preliminary to the Study of* VETERINARY MEDICINE.

ABDOMEN—The belly, which is divided by anatomiſts on its outer ſurface into four diviſions, called regions, viz. the epigaſtric, the umbilical, the hypogaſtric, and the lumbar. The cavity of the belly, which is lined on the inſide by a membrane called the peritoneum, contains the ſtomach, inteſtines, meſentery, meſocolon, liver, ſpleen, pancreas, meſenteric glands, lacteal veſſels, kidnies, renal glands, ureters; the bladder, rectum, and the internal parts of generation, are contained in that diviſion of the trunk of the body which is called the pelvis. The abdomen or belly is divided from the thorax or cheſt by the diaphragm, and extends backwards to the beginning of the pelvis.

Abductor—The name of ſeveral muſcles whoſe office is to draw back the parts into which they are inſerted.

Aberration—In medical writings, means Nature's deviating from her uſual courſe.

Ablution—Waſhing away, as waſhing off or rinſing.

Abomaſum—The name of the fourth ſtomach of any animal that chews the cud.

Abortion—The birth of any animal before its due time.

Ab-

Abstergents—A name given to certain medicines called cleanſing medicines. They are of a ſaponaceous nature, capable of diſſolving concretions formed of earth and oil, &c. which water, ſimply as an abluent, cannot effect.

Abraſion—Implies a loſs of ſubſtance by conſtant friction or rubbing. It is likewiſe applied to ulcers attended with a loſs of part of the ſubſtance.

Abſorb, *abſorption*, *abſorbents*—-Is the ſucking up or drawing into the pores of the ſkin and lungs, &c. ſuch particles as they will admit of, as water or vapour from the atmoſphere. The term abſorbent is applied to ſeveral veſſels in the animal body, as the lacteals, which abſorb the chyle from the inteſtines; likewiſe to thoſe veſſels which are called lymphatics, which opening into the different cavities of the body, either na-

turally

turally or accidentally, take up any fluids that are ſecreted, and convey them into the blood. The term abſorbent is likewiſe applied to thoſe medicines which have the power of drying up redundant humours, either internally or externally.

Abſceſs—Means a cavity containing pus or matter in any part of the body. It means likewiſe a corruption of the fleſhy parts in thoſe tumors which follow from inflammation ſeated in the cellular membrane.

Acceleratores Urinæ—Muſcles which forward the ejection of the urine.

Acerb—Whatever is ſour, harſh to the taſte, or a ſourneſs with aſtringency.

Acetabulum—Is a large cavity in a bone to receive the convex head of another to give it the advantage of a circular motion.

Acids—A generic term ; ſharp or ſour. Theſe

Thefe fubftances are too well known to require any definition. They are either mineral, animal, or vegetable. The mineral are thofe of vitriol, nitre, or common falt. The animal is obtained from ants, and other infects. The vegetable are the juice of fruits, as lemons, &c. or the product of fermentation, as vinegar, tartar, &c.

Acetum—Vinegar.

Acidity—A term frequently applied to the juices of the ftomach and inteftines, when an excefs of acid prevails there.

Acini—The name of certain glands which grow together in clufters like berries.

Acefcent—A quality afcribed to vegetable food, in order to diftinguifh it from animal diet, which is called alkalefcent.

Acrid—A term applied to thofe fubftances of a penetrating pungency. Applied to the

the ſkin, they inflame it. Chewed, they promote a diſcharge of ſaliva. Snuffed up the noſe, they promote ſneezing.

Accretion—Growth of the body.

Acrimony—Sharpneſs, tartneſs, or ſour to the taſte.

Acute Diſeaſes—Are thoſe diſeaſes which come on ſuddenly. Are rapid in their progreſs, attended with great danger, and ſoon terminate either in a ſpeedy recovery, or death; or they may change into, or form the baſis of, chronic diſeaſes. The term acute is likewiſe applied to any thing that is ſharp pointed, or has a ſharp turn.

Adeps—Fat. An animal oil contained in that part of the cellular membrane called *membrana adipoſa.*

Adheſion—Means the growing together of any parts of the body that are ſeparated

in

in a healthy ſtate, as the lungs adhering to the pleura.

Adipoſa—The cellular membrane, or *membrana adipoſa.*

Adnata—The outer coat of the eye which forms the white part. It is likewiſe called albuginea.

Aglutinants—A name given to certain medicines, which are ſaid to thicken the fluids, when grown too thin, ſharp, or corroſive.

Ægyptiacum—The name of an ointment, whoſe chief ingredient is verdigriſe, much uſed in deterging and cleanſing of foul ulcers, and keeping down proud fleſh.

Æthiops Mineral—A preparation from mercury and ſulphur.

Ætiology—A diſcourſe or a treatiſe on the cauſes of diſeaſes, and their ſymptoms.

Air—

Air—Air is that tranſparent, elaſtic, ponderous, compreſſible fluid which ſurrounds the terraqueous globe, and which, when greatly agitated, or driven in currents, is called wind. It poſſeſſes very many curious and intereſting properties of the greateſt importance. It was formerly conſidered as a pure element, but latter experiments have diſcovered that it is compoſed of three different conſtituent parts, ſeparable from each other, and of very different properties, and to which the new chemical nomenclature has given names expreſſive of their qualities, as oxygen, azot, and carbonic acid gas; which ſee under their proper heads.

Aëriform Fluids—Thoſe elaſtic fluids which eſcape from the mixture of certain chemical ſubſtances, or from ſubſtances expoſed to a high temperature, and are called gaſes. Water, heated to a certain degree, evaporates by ſteam or vapour, into an elaſtic aëriform fluid.

Aërology—

Aërology—Is that branch of medicine which treats of air; explains its properties and uſe in the animal œconomy, and its efficacy in preſerving and reſtoring health.

Albuginea—The inner coat of the teſticles is ſo called on account of its white tranſparent colour. The *tunica adnata* of the eye is likewiſe called albuginea.

Albumen or *Albuminous*—Any liquor reſembling the white of an egg, or any viſcous pellucid liquor.

Alcali or *Alkali*—The name of a plant called kali; and becauſe a great quantity of ſalt is obtained from this plant, the name of alkali has been given to the fixed ſalt of all plants; and, on account of efferveſcence ariſing upon mixing an acid liquor with this ſalt, all volatile or fixed ſalts, and all earthy ſubſtances which ferment with acids have been denominated alkalis. The herb kali, which grows on the ſea-coaſts, when dried and burnt, affords a lixivium, which, when evaporated, is the fixed alkaline ſalt. Alkalis are diſtinguiſhed into three claſſes; the mineral, vegetable, and the animal, according to the different ſubſtances from which they are extracted. The blood and humours, in certain diſeaſes, are ſaid to acquire an alkaline acrimony tending to putreſcency.

Alcaleſcent—A quality belonging to animal diet.

Alcohol—The name given to ſpirit of wine, exalted to its higheſt purity and perfection.

Alteratives—Are thoſe medicines which are ſuppoſed to make a change in the blood and

and humours to the better, without any manifeft operation or evacuation.

Alembic—A machine for diftilling liquors.

Alexipharmics—Medicines ufed in the curing of malignant fevers.

Alexiterials—A name given to medicines which are recommended as prefervatives from contagion.

Aliment—The food that is taken into the ftomach to nourifh the body.

Allantois or *allantoides*—The membrane fo called which forms part of the fecundines after birth. Its office is to contain the urine difcharged by the fœtus before birth, and peculiar to the brute fpecies only, although fome anatomifts have afferted the exiftence of the allantois in the human fpecies.

Allium—Common garlic, much ufed as a medicine for horfes and other cattle.

Aloe

Aloe—A plant which affords the purging gum of the fame name, of which there are three kinds, viz. the fuccotrine or zocotorine, the hepatic or Barbadoes, and the caballine or horfe aloes.

Althæa—Marfhmallow, an herb.

Allumen—Alum, a falt, ufed as a powerful aftringent.

Alveoli—The fockets in the jaws in which the teeth are fet.

Amaurofis—Is a decay or lofs of fight when no fault is obferved in the eye, except that the pupil is fomething enlarged and motionlefs.

Amara—Bitters. The term amara is ufed in medical prefcriptions to fignify bitters.

Amnion or *amnios*—The internal membrane which furrounds the fœtus. It is a fine tranfparent membrane, foft but tough, fmooth on its infide but rough on the outer.

The

The amnion is found in all animals, both viviparous and oviparous.

Analeptics—Are ſuch medicines as exhilerate the ſpirits; they are likewiſe called cordials.

Analogy—Is the mode of reaſoning of things not perfectly known, by compariſon with others which are better underſtood, and drawing concluſions from their ſimilitude.

Analyſis, or *analyſe*—Is the reducing by chemiſtry any matter or ſubſtance into its primary conſtituent parts, with a view of diſcovering its compound parts.

Anaſarca—A ſpecies of dropſy, from a ſerous humour ſpreading between the ſkin and the fleſh, or a general accumulation of lymph in the cellular ſubſtances. This occurs frequently on the breaſt and belly of horſes.

Anaſtamoſe

Anaſtamoſe—A term in anatomy to expreſs the inoſculation or joining of the arteries with the veins.

Anueriſm—Is a tumor ariſing from the dilatation of the coats of an artery.

Anatomy—Is that branch of ſcience which teaches us the knowledge of the ſtructure of an animal body by diſſection.

Anchyloſis—Is a growing together of the ends of two bones that have been ſeparated by cartilages in a natural healthy ſtate. But when theſe cartilages are eroded or deſtroyed by any cauſe whatever, the ends of the bones unite and form one bone, hence a ſtiff joint and lameneſs.

Angina—A quinſy or ſore throat, which is an inflammation in thoſe parts that are ſubſervient to deglutition or ſwallowing.

Animal—All bodies indowed with life and

and with ſpontaneous motion are called animals. of courſe all ſubſtances belonging to or proceeding from animals are ſaid to be belong to the animal kingdom, in order to diſtinguiſh them from the vegetable and mineral claſſes.

Animalculae—A diminutive of the word animal, that is they are ſo little animals as require to be viewed through glaſſes in order to diſtinguiſh or diſcern them diſtinctly.

Animal Economy—Is the conduct of nature in the formation and preſervation of animal bodies.

Animal Heat—Proceeds from that portion of fire which is containd in the blood of all perfect animals.

Animal Motion—May be either voluntary or involuntary. The involuntary are thoſe of the heart and arteries. The lungs and

muſcles

mufcles of the thorax. The voluntary are under the direction of the will.

Animal Faculty—The power of performing any action of the body. The term faculty is likewife applied to that of the fenfes, as the faculty of feeing, hearing, &c. In the human body, it extends to that of memory, imagination, and reafoning.

Anife—An herb. The feeds of which are only ufed in medicine, and are of great ufe in flatulent complaints, as griping of the bowels.

Anodyne—Such medicines as are given with a view to eafe pain and procure reft or fleep. They are likewife called *opiates* and *narcotics*.

Anorexy—A want of appetite, without altogether a loathing of food.

Ant

Antacids—Such remedies as refift or deftroy acids in the ftomach and *primæ viæ*, or firft paffages.

Anthelmintic—Thofe medicines which are given as remedies againft worms.

Antidote—Thofe medicines that are given to prevent the bad effects of any poifonous fubftance taken into the ftomach, or apprehended contagion.

Antimony—Is a ponderous brittle mineral, compofed of long fhining ftreaks like needles, intermingled with a dark lead coloured fubftance, of no manifeft tafte or fmell; much ufed as an alterative to horfes.

Antiphlogiftic—A term given to certain remedies which tend to lower the fyftem, by exhaufting the living powers; and this is done moft readily by evacuations, particularly by bleeding and purging.

Antiſeptics—Such remedies as reſiſt putrefaction.

Antiſpaſmodics—Remedies againſt convulſions.

Anus—The extremity of the inteſtinum rectum, called the fundament.

Antrum—Implies a cavity or labyrinth. Hence it is applied to the labyrinths of the ears; to the antrum maxillare, or maxillary ſinuſes, which are ſituated in each cheek in the upper jaw, and opens on their upper part into the noſtrils. This ſinus is always more or leſs filled with a mucous matter in that diſeaſe ſo fatal to horſes called the glanders.

Aorta—The name of the great artery proceeding from the left ventricle of the heart.

Aphoriſm—A ſhort ſentence expreſſing the properties of a thing; a maxim or principle to direct to any knowledge in the different ſciences.

Apthae—

Apthae—Small ſpreading ulcers in the mouth, by ſome called the thruſh.

Apex—A term uſed in deſcribing any thing that has a point, as the apex or point of the heart.

Aponeuroſis—A term in anatomy which ſignifies any tendinous expanſion of a muſcle, which grow gradually thinner till they are loſt in the cellular membrane. They likewiſe bind down certain muſcles while in action, and increaſe their ſtrength by compreſſing them.

Apophyſis or *Epiphyſis*—An appendix or a bone annexed to another by means of a cartilage. This cartilage is only obſervable in young ſubjects, for in adults it cannot be diſtinguiſhed from the bone.

Apoplexy—Is a ſudden privation of all ſenſe and voluntary motion; the pulſe, at the ſame time, being kept up; but reſpiration

tion is oppreſſed. A deep ſleep, with inſenſibility and ſnorting, ſeems to be conſtant attendants of this diſorder both in man and in other animals.

Aqua—The Latin name of water; and which is always continued in medical preſcriptions under that term, whether ſimple water, or officinal by diſtillation with herbs, or with ſpirits, &c. Water has always been conſidered as a pure and ſimple element, till of late years it has been diſcovered, by experiments, that it conſiſts of two diſtinct parts, ſeparable from one another, and to which the new chemical nomenclature has given names expreſſive of their qualities, as oxygen and hydrogen; which ſee under their proper heads.

Arachnoid—One of the coats of the eye which reſembles a ſpider's web. It is alſo called *aranea*. Likewiſe that fine tranſparent membrane lying between the dura and pia mater of the brain.

Arcanum

Arcanum—A fecret; or a medicine whofe preparation or efficacy is kept fecret, in order to enhance its value.

Ardent—A term given to thofe fevers which are attended with great heat. It is likewife applied to ftrong fpirits.

Argilla—Clay or argillaceous earth, of a foft fubftance; very ductile and tenacious when moift, but rendered hard by fire.

Aromatic—Aromatics, or fpicy drugs, which are of a warm pungent tafte, with more or lefs of a fragrant fmell.

Arfenic—or Ratfbane. A mineral, found more or lefs in ores of metal. A violent poifon.

Artery—The name of thofe round veffels which take their rife from the heart, and contain that fluid which is called blood. Their office is to convey the red blood from the heart through all parts of the body.

Articulation

Articulation—The joints, or the joining of bones together by ligaments.

Afcarides—A fpecies of worms, fo called from their continual troublefome motion, which caufes an itching at the anus. They are very fmall, like long needles, white, and have fharp pointed heads. They are generally lodged in the rectum both of man and animals, but fometimes they are found higher up in the inteftines.

Afcites—Dropfy, or collection of water in the belly.

Affimilate—To make like to. To affume a quality, as when the aliment that is taken into the ftomach is converted or affimilated into blood.

Afthma—Is a difeafe of the chronic kind, attended with a laborious refpiration or breathing. In our patients it is called broken wind.

Aftringents

Aſtringents—Are thoſe ſubſtances which contract and ſtrengthen the fibres, after being relaxed, as in bruiſes and ſtrains externally. Internally, aſtringent medicines are given with the view of checking too great ſecretions.

Atmoſphere—Is the whole body of air and vapour which ſurround the earth.

Atony—A defect of muſcular power; ſuch as relaxation, laxity, or debility.

Atrophy—Is a waſting or decay of any member or part of the body, or of the whole body.

Attenuants—Such medicines as are ſuppoſed to attenuate or make thin the too thick fluids in the body.

Attrition—Implies to rub or wear away, by conſtant action on the parts. Thus the circulating fluids are ſaid to wear away the

ſides

fides of the veffels in which they circulate. Attrition is likewife applied to the action of the ftomach in digefting the food.

Auricle—The external part of the ear. It is likewife applied to the two mufcular bags at the bafis of the heart, which are called its auricles or ears, and are joined to the ventricles.

Axis—A point on which any thing revolves, or is fuppofed to revolve.

Azigos—Signifies without a fellow; as fome particular mufcles and veins have no fellow, they are termed azigos.

Azot—One of the conftituent parts of atmofpheric air; when collected by itfelf it is called azotic gas; a name in the new chemical nomenclature expreffive of its noxious qualities, as it kills animals the inftant they draw it into the lungs. It extinguifhes tinguiſhes flame, and will not admit of the combuſtion of inflammable bodies, nor of the calcination of metals.

B.

Back-racking—A term for an operation in farriery, which is, after anointing the hand and arm with freſh butter, hogſlard, or oil, to introduce it into the anus, and, by degrees, draw out the hardened excrements out of the rectum. In the human body, in like caſes, a marrow ſpoon is made uſe of.

Balſamics—A name given to a certain claſs of medicines, meant to expreſs their healing qualities.

Barbs—A term in farriery. The name of a diſeaſe ſaid to be in the mouths of horſes, but which is only founded on ignorance of the ſtructure of the parts.

Barometer—An inſtrument to determine the weight of the air, or to obſerve its changes, commonly called a weather-glaſs.

Baſis—The foundation, bottom, baſe, or pedeſtal; the ſupport of any thing. Thus, the broad part of the heart is called its baſis, to diſtinguiſh it from its apex or point.

Biceps—A double headed muſcle.

Bile—Is a bitter viſcid juice, ſecreted from the blood in the liver. In the human body, it is collected into a receptacle called the gall bladder or cyſt. Hence, in man, there may be ſaid to be two kinds of bile, the cyſtic and the hepatic. But in our ſubject, who has no gall bladder, the latter only is ſecreted, and paſſes continually into the duodenum, where it mixes with the chyle. If, from any cauſe, the bile is carried into the blood, it produces the jaundice; and, if long continued, by diſſolving the blood, a dropſy follows.

Bladder

Bladder—That veſſel which is ſituated in the pelvis and where the urine is collected, and afterwards diſcharged from the body. It is commonly called in medical writings *veſica urinaria.*

Blood—Is that red fluid which is contained in the arteries and veins. On a ſuperficial view, it appears of an uniform quality; yet, at the ſame time, it conſiſts of very diſſimilar parts, viz. the red globules or craſſamentum, ſerum, ſalt, earth, fixed air, and iron. To theſe may be added elementary fire.

Blood ſpavin—A term in farriery, and which is a dilatation or enlargement of the vein on the inſide of the hough, extending below and above the joint, but more enlarged towards the middle. In the human body, ſuch enlargement of the veins are called varix, or varicoſe ſwellings.

Bones

Bones—Are the hardeſt and moſt ſolid parts of an animal body. They ſerve as the baſis to ſupport the whole frame, and to preſerve the ſofter and leſs firm parts in all their motions and preſſures. The bones are covered with a membrane called the perioſtium, which is exquiſitely ſenſible when inflamed, being plentifully ſupplied with nerves and blood veſſels.

Bone ſpavin—In farriery, an excreſcence growing on the bone, on the hough joint, or near it.

Borborygmus—A rumbling noiſe in the bowels; excited by wind mixed with ſome degree of humidity.

Botany—Is the ſcience of plants, or that part of natural hiſtory which belongs to the vegetable kingdom.

Boulimus, *boulimia*, *bulimy*—A voracious appetite, called the hungry evil. Bulimy ſignifies an ox's appetite.

Bovina

Bovina affectio—A diſeaſe among black cattle, cauſed by a worm lodged between the ſkin and the fleſh.

Botts—A thick ſhort round worm, about the ſize of a large bee, which infeſts the ſtomach of horſes.

Brain—See cerebrum and cerebellum.

Broken wind—See aſthma.

Bronchia—The aſpera arteria, or windpipe, which deſcends from the fauces or throat, growing narrower as it approaches the lungs, where it divides into two branches, one to each lobe of the lungs. The term bronchial is likewiſe applied to certain arteries, &c.

Bronchotomy—The operation of cutting, or making an opening between the rings of the windpipe.

Burſae—

Burſae mucoſae—Certain bags about the joints and tendons, whoſe office it is to emit a lubricating mucus to facilitate motion.

Bezoar—Are preternatural or morbid concretions, like ſtones, formed in the ſtomachs of ſeveral animals. In horſes, they are mixed with the hair and duſt they lick off their bodies.

C.

Cachexy—An univerſal bad habit of body, in which there is a defect of vital heat.

Caecum—The name of one of the inteſtines, called the blind-gut, from its being perforated at one end only.

Calcination—The reduction of ſolid bodies by the means of fire, from a ſolid to a powdery ſtate, accompanied with a change of their qualities.

Cal-

Calculus, calculi—Stone, ſand, or gravel. By the former is generally meant ſtone in the bladder or kidneys; by the latter, ſand or gravel affecting theſe parts. The concretions obſerved in the paſſage of the bile, are called calculi or gall ſtones, although they are only concreted bile in hard lumps.

Callus—Hardened ſubſtances of the ſkin, &c. They are either cutaneous or oſſeous, natural or preternatural. But generally this term is applied to mean thoſe callous ſubſtances generated about the edges of a fractured bone or wound.

Calloſity—A kind of hard ſwelling without much pain.

Calomel—A preparation of mercury; called *mercurius dulcis*, or ſweet mercury.

Caloric—A term in the new chemical nomenclature, which means ſenſible heat in all bodies, whether ſolid or fluid. Caloric or heat is of ſuch a penetrating nature, that no veſſel can contain it; it penetrates all bodies. It liquifies ſolid ſubſtances, and rarifies liquids, ſo as to render them inviſible and give them the form of air, or what is called aeriform fluids.

Calx—The reſidue or remaining parts of minerals, metals, or ſtones, after undergoing the action of the fire.

Camphor—A vegetable concrete gum, unctuous to the touch, with a fragrant ſmell and a bitter aromatic taſte, accompanied with a ſenſe of coolneſs on the tongue.

Canal—Any duct or hollow pipe which conveys fluids, &c. through any part of the body. Thus the inteſtines are called the alimentary canal.

Cancer—A ſcirrhous tumour. Terminating in an ulcer of the worſt kind.

Can-

Cancerous—A diſpoſition or tendency towards cancer.

Cantharides—Spaniſh flies; an inſect of a golden green colour uſed in bliſters.

Canthus—The angle of the eye, or the cavities at the extremities of the eyelids, called the corners of the eye. The greater canthus is next to the noſe; the leſſer canthus lies towards the temples.

Capillary tubes—Are ſmall veſſels, or ſmall fibres, in an animal body; ſo called, becauſe they reſemble ſmall hairs.

Capſula or *capſular*—The name of thoſe ligaments which ſurround the joints. The name capſular is likewiſe applied to any thing that reſembles a bag.

Carbon—The baſe of charcoal.

Carbonic acid gas—One of the conſtituent parts of atmoſpheric air; ſo named in the new chemical nomenclature, expreffive of its qualities; amongft which are its abforbing from the lungs in refpiration, a principle which exhales from the blood, and which appears to be of the fame nature with carbon or charcoal.

Caries—Is a partial mortification of the bone, which feparates from the found part fooner or later. It is likewife applied to fome fpecies of ulcers where the bone is fuppofed to be affected.

Carus, *caros*—A name given to thofe difeafes in which there is great infenfibility, heavinefs, and fleepinefs, with quiet refpiration.

Cartilages or *griftles*—Are folid, fmooth, white elaftic fubftances, between the hardnefs of a bone and that of a ligament. They cover the extremities of the bones in the articulations of the joints.

Ca-

Carotid—The name of the arteries of the neck, external and internal.

Caruncle—A ſmall piece of fleſh, or an excreſcence that has the appearance of fleſh. Thus, there are the *caruncula lachrymalis* in the corners of the eyes, and carunculae myrtiformes at the entrance of the vagina, &c.

Carminatives—The name given to thoſe medicines which are ſuppoſed to diſpel wind from the ſtomach and bowels.

Carnivorous—Devourers of fleſh. Animals whoſe food is fleſh are thus called.

Caſtration—The operation of gelding, cutting away the teſticles.

Catalepſy—A name given to a certain ſpecies of apoplexy.

Cataract—Is an opacity or whiteneſs of the

the cryſtalline humour or lens of the eye, which prevents the rays of light paſſing through it to the retina, and preventing viſion.

Catarrh—Is an inflammation of the mucous membrane which lines the noſe and parts adjacent, followed with an increaſed morbid diſcharge of the natural ſecretions from the noſe, eyes, mouth, throat, and lungs. In the leſſer degrees of this complaint it is called a cold.

Cathartic—The name given to purging medicines.

Catholicon—A general or univerſal medicine, which was formerly ſuppoſed to purge off all kinds of bad humours.

Cauſe—A cauſe of a diſeaſe is whatever impairs the animal functions, by producing

ducing diforders in the folids, fluids, or both.

Cauftic—A name given to fuch fubftances as deftroy the texture of the parts to which they are applied.

Cautery—Is either actual or potential. The actual cautery is hot iron; the potential is cauftic fubftances.

Cavernous—Any thing that is hollow; as the body of the penis.

Cava vena—The large vein which receives the refluent blood, and conveys it to the heart. It is defcribed as two; the afcending and defcending, part being above the heart, and part below it.

Cellular membrane—It is likewife called *tela cellulofa*. *Paniculus adipofus*. This membrane is of a cellular fubftance, and is made

made up of an infinite number of little plates or ſcales, which, by their various directions, form ſmall cells and web-like ſpaces, and join together all the parts of an animal body in ſuch a manner as not only to ſuſtain, but to allow them a free and ample motion at the ſame time. This membrane is of the greateſt extent, and of the utmoſt conſequence in the ſtructure of the animal body.

Cellular—Made up of ſmall cavities or cells.

Cephalics—A name given to thoſe remedies againſt diſorders in the head.

Cerebrum—The brain. The whole maſs of which is divided into the cerebrum and cerebellum. It conſiſts of two ſubſtances, the cortical or cineritious, and medullary.

Cerebellum—The back part of the brain; or, or, in our fubject, the upper part. Some call it the little brain.

Cervical—Nerves which pafs through the vertebræ of the neck.

Chalybeate—Partaking of iron, or impregnated with it. Water impregnated with iron is called chalybeate water.

Chemiftry—Is the art of combining or feparating the conftituent parts of bodies by fire and mixtures. It is a very important branch of natural philofophy, and has for its objects the properties of bodies, which it difcovers by analyfis and by combinations, and explains the intimate and reciprocal action of all bodies in nature on each other.

Chemical—Any thing that relates to chemiftry or belongs to it.

Cheft founder—A term in farriery, and very improperly applied to any inflammatory diforder within the thorax.

Chine

Chine, mourning of—Or mourning of the chine *; a very unintelligible term in farriery, which has been applied to the glanders in horſes in the laſt ſtage of that diſorder, when the diſcharge from the noſtrils became of a blackiſh colour; and, as it was then ſuppoſed that it was the ſpinal marrow that was diſcharged from the chine or ſpine, it was called the mourning of the chine.

Choroid—A name given to ſeveral membranes, which, on account of the multitude of their blood-veſſels, reſemble the chorion.

Chorion—The name of the external membrane of the fœtus. It has its name from the *chorus* or crowd of blood-veſſels which are ſpread all over it.

* Our plan obliges us to inſert theſe abſurd terms; and, what is ſtill worſe, to define them when practicable. It were much to be wiſhed, that all ſuch unmeaning terms were exploded entirely from the art.

Chronic

Chronic or *chronical*—This term is applied to thofe difeafes that continue long, without any acute or recent fymptoms taking place, and are thus called to diftinguifh them from thofe difeafes which proceed rapidly and foon terminate in death or recovery, and which are called acute.

Cryftalline lens—One of the humours in the eye; fo called, becaufe it refembles cryftal.

Chyle—The white juice formed in the ftomach by digeftion of the aliment. It is the nutritious part of the food; which, being abforbed or fucked up by the lacteal veffels in the inteftines, is carried into the circulation and converted into blood.

Cicatrix—A feam or elevation of callous flefh rifing on the fkin after the healing of a wound or ulcer.

Cilia—The extreme parts, or edges of the eye lids, with long hairs fixed in them.

Ciliary—A name given to certain glands and ligaments on the inner edge of each eyelid. Ciliary ligament, called *proceſſus ciliarus*, is a range of dark coloured fibres in the eye.

Cineritious—Subſtances of an aſh colour. Thus, the cerebrum is called the cortical or cineritious part of the brain.

Circulation—This term is applied to the circulation of any fluid through the veſſels deſtined for its conveyance; but, properly ſpeaking, the term circulation is only applied to that of the blood, becauſe it moves from the heart to return to it again, as it were forming a circle.

Coagulation—Is when a fluid, or ſome part of it, is rendered more or leſs ſolid.

Coats

Coats—The outer coats or coverings of veſſels, &c.

Coheſion—Is that wonderful property impreſſed on matter, by which its elementary parts, when they approach each other to a certain degree, ruſh into contact with each other, and remain in that ſtate until they are diſunited by a force ſuperior to their attractive power.

Colic—Pains in the belly, which may be either inflammatory, flatulent, ſpaſmodic, or bilious.

Colon—The name of one of the large inteſtines.

Colt evil—A term in farriery, which is a frequent erection of the penis in young high fed horſes, and, by rubbing it againſt the belly, produces a diſcharge of ſemen. This term is likewiſe applied to any diſ-

charge

charge of matter from the penis through the urethra.

Coition—The act of venery.

Coma—A degree of apoplexy in which the loſs of ſenſation is not conſiderable.

Concuſſion—Is a ſudden jolt or ſhock of the brain by blows, &c. which may occaſion a ſuſpenſion of its faculties, or a total abolition of them.

Concoction—Digeſtion of the food. In ſurgery, that operation of nature upon morbid matter which renders it fit to be diſcharged from the healthy fluids, as in wounds, &c.

Concrete—Is the growing together of any parts in the body, which are ſeparated in a natural healthy ſtate.

Condenſe—An inſpiſſation or thickening of any ſort of fluid, whether in or out of the body.

Con-

Condiment—Things ufed in preparing aliments, whether to render them palatable or to affift their digeftion.

Condition—The ftate, habit, or conftitution of the body.

Conductor—An inftrument in furgery, whofe ufe is to conduct the knife in fome operations.

Congelation—That change which is produced by cold upon fluid bodies, and by which they become folid. Alfo any difeafe which may be fuppofed to arife from cold.

Congeftion—A collection of matter: A fwelling which rifes gradually, and ripens flowly, in oppofition to thofe tumours which are foon formed and foon terminated.

Conglobate—The name given to fome glands that are fingly gathered into the

fhape

ſhape of a ball. Thus, a conglobate gland is a little ſingle ſmooth body, wrapped up in a fine ſkin, by which it is ſeparated from all other parts, only admitting an artery and a nerve to paſs in, and giving way to a vein and excretory canal to paſs out. Of this ſort are the glands of the brain and of the teſtes.

Conglomerate—Is likewiſe the name of certain glands which are compoſed of many little conglobate glands all tied together in cluſters, and wrapped up in one common membrane.

Conjunctiva tunica—Is that tunic or coat which makes the white of the eye.

Conſumption—Is generally applied to that waſting of the body which proceeds from the abſorption of purulent matter from the lungs. It is likewiſe called *phthiſis pulmonalis*.

Con-

Conſtipate, *conſtipation*—Coſtive, or what is called bound in the body. This may happen when the excretion from the inteſtines is not regular, but alſo when what is diſcharged is too hard to receive its form from the impreſs of the rectum.

Conſtitution—The natural temperament peculiar to different conſtitutions or habits of body.

Conſtriction—Shutting up the pores of the ſkin from cold or any other cauſe.

Contact—The meeting of two bodies that they touch each other.

Contagion, or *infection*—Are ſuch diſeaſes as are ſaid to proceed from one diſeaſed animal infecting another of the ſame ſpecies with the ſame malady, either by contact, or by the effluvia paſſing from the diſeaſed to the ſound body.

Con-

Contraction—An immobility of any of the joints, induced by a preternatural contraction of ſome of the muſcles deſtined in a natural ſtate to move them, or from ſome derangement of the oſſeous or ligamentous parts about the joint affected; likewiſe a contraction of the hoofs in horſes.

Contuſion--A ſynonimous term for a bruiſe, either attended with a wound or not.

Convulſion—Is an involuntary contraction of the muſcles, and which may be either partial or general, according to the violence of the cauſe from which they may proceed.

Converging—Rays tending to one point.

Cor—Is a term uſed in different ſciences; but in anatomy, it means the heart.

Core—In farriery, a piece of dead or mortified fleſh that ſeparates from the ſound

parts

parts in the heels of horſes in the winter ſeaſon, leaving a large hole or opening. Cauſtic ſubſtances introduced into the openings of ſinous or fiſtulous ulcers, by deſtroying the texture of the parts, have the ſame effect, and are called coreing out the ſinus or fiſtula.

Cornea—A coat of the eye; which is alſo called *ſclerotica*. It is the firſt coat which is proper to the eye. It is ſtrong, thick, and tendinous. The fore-part of this coat bearing a reſemblance to tranſparent horn, from which it takes its name of cornea. The rays of light are tranſmitted through the cornea into the eye.

Coronet—In farriery, the upper part of the hoofs of horſes, where the hair terminates.

Coronary—A name given to ſome ligaments, veſſels, &c. from their particular ſituation when ſurrounding any part in the manner of a crown, as the coronary veſſels on the baſe of the heart.

Corpuſcle—Very ſmall bodies, or an atom.

Corroſive—Corroding medicines, which deſtroy the texture of the parts they are applied to.

Coroborants—Strengthening medicines.

Cortical—The cortical ſubſtance of the brain.

Corrugation—The folding of the ſkin into wrinkles.

Corruption—The decay or ſolution of the parts of any ſubſtance.

Cortex—The name of many drugs, which conſiſt of the bark of trees or of roots.

Cor-

Corufcation—Flafhing, fhining, or light produced by the collifion of two hard bodies.

Coftæ—The ribs furrounding the thorax.

Cramp—A fudden convulfion of the mufcles, or any organ affected by it.

Cranium—The fkull, which inclofes the brain.

Crapula—A furfeit of food taken into the ftomach. It fometimes fignifies eruptions on the fkin from obftructed perfpiration.

Crafis—The quality of the blood peculiar to every conftitution.

Craffamentum—The thicker parts or red globules in the blood.

Cretaceous—Any chalky fubftance.

Crifis

Crifis—Is the termination or change of a difeafe, either by recovery or death.

Crown fcab—In farriery, a difeafe that takes place on the coronet, immediately above the hoof, and which is an ouzing of a thin ichorous matter through the pores of the fkin, of a very fœtid fmell.

Cruor—Belonging to the blood. Sometimes it is applied to congealed blood, fometimes to the blood in general, and fometimes to the venal blood only.

Crudity—Undigefted fubftances in the ftomach, or humours of the body.

Cruft—In farriery, the fhell, or outer walls of the hoofs of horfes, where the nails are drove in fhoeing.

Cryptæ—Hollow places, like cavities, containing fome fluid.

Curb

Curb—In farriery, a callous ſubſtance that grows on the back part of the hock joint in horſes.

Curtailing—In farriery, cutting off the tail from a horſe.

Cutaneous—Belonging to the ſkin.

Cutis—The true ſkin. It is a ſtrong, thick, univerſal covering of the whole external parts of the body. It is compoſed of a cloſs cellular texture of fibres of various kinds, and covered externally with a thick coat of hair.

Cuticle—The ſcarf ſkin. It is likewiſe called the *epidermis*, becauſe it is placed on the true ſkin as a covering. It is of a more compact texture than the true ſkin, and full of pores, for the evacuation of what tranſpires through them from the body. It is

this

this cuticle or ſkin that riſes on the application of bliſters.

Cutaneous—Belonging to the ſkin.

Cyſtic—A name applied to certain ducts, arteries, and veins in the liver.

Cyſtis—A bag or bladder, or the receptacle of morbid humours.

Cynanche—A name of ſeveral kinds of quinſy, or inflammation of the parotid glands; ſo called, becauſe dogs are ſaid to be liable to it.

D.

Debility—Weakneſs, feebleneſs, infirmity.

De-

Decoction—The act or operation of boiling.

Deflageration—Burning, or the consuming the combustible parts of a substance by fire, or the calcination of metals.

Defluction—The flowing down of morbid humours upon any inferior part, as in a catarrh, &c.

Deglutition—Is the action of swallowing the food or drink, by the united force of the muscles of the throat, together with that of the tongue, &c.

Deliterious—Pernicious, hurtful, or poisonous.

Deliquation—The solution of any body when exposed to air, as salts, &c.; also the melting or reducing any solid substance into a liquid state by the application of heat.

De-

Delirium—Alienation of mind; roving in fevers; light headednefs.

Deltoid—The name of a mufcle.

Demulcents—Such medicines as fheath or blunt the acrimony of the humours, and render them mild. Emolients are of this clafs.

Dentes—The teeth. They are made up of a bony fubftance and an enamel. They are divided into three claffes; the incifores, canini, and molares.

Denfity—Clofenefs or compactnefs of any body or fubftance.

Dentition—Breeding of teeth.

Deobftruants—Such medicines as open obftructions. They are fometimes called aperients.

Deri-

Derivation—Is when any humour, which cannot be conveniently evacuated at the part affected, is attracted or drawn from thence and difcharged elfewhere.

Detergents—Such medicines as deterge or cleanfe abfceffes or ulcers of fuch vifcid humours as adhere to and obftruct the veffels.

Determination—In phyfiology, means, that certain proportion of humours tranfmitted to each organ in the body, not only with refpect to its quantity, but the degree of motion with which it is conveyed to each part, in a healthy ftate. In inflammatory cafes, the blood feems to be determined to the inflamed part with great force.

Diabetes—Is a profufe difcharge of urine at fhort intervals.

Diagnofis, *diagnoftic*—The figns of a difeafe. They are of two kinds, viz. the adjunct and pathognomonic. The adjunct are common to feveral difeafes, and ferve only to point out the difference between difeafes of the fame fpecies. The pathognomonic are thofe which always attend the difeafe, and diftinguifh it from all others.

Diapente—In medicine, a compofition fo called becaufe it confifts of five ingredients.

Diaphoretics—Medicines which promote perfpiration.

Diaphragma—That ftrong membrane which divides the thorax or cheft from the abdomen. It is alfo called the midriff.

Diarrhœa—Is a flux, or purging, when the inteftines are folicited to a too frequent difcharge of their contents.

Di-

Diaſtole—Is that motion peculiar to the heart in its firſt vibration, when it dilates to receive the blood from its auricles or ears, and then contracts and throws the blood into the arteries. This latter motion is called its ſyſtole. Hence theſe two motions are expreſſed by the ſhort words of diaſtole and ſyſtole.

Diatheſis—An affection, or a diſpoſition, as when the blood is inclined to ſome faulty ſtate.

Digeſtion—In the animal œconomy, is the converſion of the food or aliment into chyle or nouriſhment. In ſurgery, it means the ſuppuration of matter or pus well digeſted from a wound or ulcer. It is likewiſe applied to certain operations in pharmacy.

Dilation—Opening, widening, or extending. It is ſometimes uſed for diaſtole.

Di-

Diluents—Whatever, on being mixed with a fluid, renders its parts more fluid; therefore, the diluent muſt be a fluid more fluid than that with which it is to be mixed.

Diploe—It is the ſoft porous part between the two plates or tables of the bones of the ſkull.

Diſpenſatory—The place where medicines are prepared, or a book treating of the compoſition of medicines.

Diſſolvents—-Medicines which diſſolve concretions in the body.

Diſſolution—Diſſolving; breaking down; death.

Diſtention—Simply ſignifies dilatation, or opening, as when the veſſels are too full of blood they are ſaid to be diſtended.

Diſ-

Diſſection—To cut up; to diſſect; the cutting up a body with a view of examining the ſtructure of its parts.

Diſcutients—Are ſuch medicines as by their ſubtility diſſolve a ſtagnating fluid, and diſſipate the ſame without an external ſolution of continuity.

Diſtemper—A diſeaſe, when general in one part of the country, or a certain diſtrict, is, by way of eminence, called the diſtemper. Thus, the diſtemper amongſt horſes; the diſtemper amongſt the horned or black cattle.

Diſeaſe—May be defined ſuch an alteration of the properties of the fluids, or ſolids, or of their organization, or of the action of the moving powers, as produces an inability or difficulty of performing the functions of the whole or any part of the ſyſtem. Diſ-

eaſes

eafes are divided into two claffes, the acute and chronic.

Diuretics—Medicines which provoke a difcharge by urine.

Domeftic—When applied to animals, fignifies thofe that are kept and fed at home, to diftinguifh them from thofe that are wild.

Draftic—Purging medicines of a violent quality, and ftrong in their operation.

Dropfy—A collection of water in any part of the body, and bears different names according to the part affected.

Duct, or *canal*—This term is frequently applied to parts of the body through which particular fluids are conveyed, and bears different names according to their fituation. Thus, an excretory duct is a canal containing a fluid different from red blood, and is almoft almoſt always the outlet of a gland or ſome glandular ſubſtance. The inteſtines are likewiſe called the alimentary canal.

Duodenum—The name of that inteſtine which begins immediately at the right orifice of the ſtomach.

Dura mater—That membrane which lines the inſide of the ſkull.

Dyſentery—Bloody flux, or a frequent diſcharge of blood in the ſtools, accompanied with griping pains, and followed with a teneſmus.

Dyſpnœa—Difficulty of breathing.

Dyſury—Difficulty of voiding the urine.

Dyſpepſy—Depraved digeſtion, as when what is digeſted becomes of a morbid quality.

E.

Earth—One of the ſimple ſubſtances formerly called elements; ſeveral kinds of are uſed as medicine.

Ecchymoſis—This term is applied to bruiſed parts, and is an effuſion of blood and humours from their reſpective veſſels. Thus, when by the violence of a blow, or preſſure of any heavy object, the ſmall veins on the part are broken, and the blood is gradually diſcharged from them. This blood is collected under the ſkin, and is called ecchymoſis, the ſkin remaining entire at the ſame time. In the human body, this is eaſily diſtinguiſhed by the blackneſs of the parts affected; but in our ſubject, whoſe ſkin is covered with a thick coat of hair, it can only

only be known from the tumor and fwelling of the parts.

Effervefcence—A flight degree of ebulition in liquors, which takes place, or is excited, by mixing any acid fubftance with an alkaline.

Effluvia—Minute particles which exhale from corrupted and other bodies, and which float in the air. By the effluvia from morbid bodies contagious difeafes are propagated.

Elafticity—Is that property in bodies by which they reftore themfelves fpontaneoufly to the figure and dimenfions which they had loft by the action of fome other body applied to them.

Element—The elementary or fimple parts of which the animal body is compofed, and may be defined to confift of the moft minute and ſimple particles, as thoſe of fire, air, water, and earth.

Elephantiaſis—A ſpecies of leproſy; ſo called from incruſtations covering the ſkin; alſo a diſeaſe affecting the legs, in which they grow thick, reſembling thoſe of the elephant.

Embrio—The beginning fœtus.

Emetic—Medicines which provoke vomiting. They likewiſe determine the perſpirable matter to the ſurface of the body, and promote ſweat.

Emollients—That claſs of medicines which are ſaid to relax and ſupple the ſolids. They alſo ſheath or blunt the aſperity or ſharpneſs of the fluids.

Emphyſema—Means any flatulent tumor which is ſoft to the touch, ariſing from air being admitted into the cellular membrane.

Em-

Empiric—An appellation beſtowed on quacks, who, without knowledge in their profeſſion, pretend to perform miracles by ſome deſperate noſtrum.

Empyema—This term is applied to a collection of matter in the cavity of the breaſt.

Empyreuma—That offenſive taſte and ſmell which diſtilled waters and other ſubſtances receive from being too much expoſed to the action of fire.

Emulgents—The name of thoſe arteries and veins which go from the aorta and vena cava to the kidneys.

Emunctory—A term applied to thoſe paſſages in the body by which ſuperfluous matters are evacuated.

Encephalon—The cavity of the head, which contains the dura and pia mater, the

cere-

cerebrum, the cerebellum, and the medulla oblongata.

Encephalus—The brain by itſelf.

Encyſted—A tumor incloſed in a bag or veſicle.

Enema— A glyſter, or any kind of medicines injected into the anus.

Enteritis—An inflammation of the bowels.

Ephemera—A fever of one day's continuance.

Epidemical—A name given to thoſe diſeaſes which are more or leſs general, or prevalent in one part more than another, and attack people or many animals at the ſame time.

Epidermis—The cuticle or ſcarf ſkin.

Epi-

Epigaſtric—A term applied to certain arteries and veins. It is likewiſe applied to the region of the ſtomach and parts adjacent.

Epiglottis—The aperture or opening of the larynx or windpipe.

Epilepſy—The falling ſickneſs; ſo called, becauſe the patient falls ſuddenly to the ground.

Epiphyſis—A ſmall bone annexed to a larger by [illegible]ans of an intervening cartilage.

Epiplaſma—A poultice.

Epiphora—A term applied to any violent or impetuous flux of humours to any part of the body, but more particularly to the eyes, when the tears trickle down the cheeks, in conſequence of obſtructed puncta lachrymalia,

malia, which hinders them from being conveyed into the nofe by that paffage.

Epifthotones—A fpafmodic convulfion; a rigidity of the whole body.

Epulotics—A name given to medicines which dry up the moifture of wounds, and difpofe them to be covered with fkin.

Epiploon—A name frequently given to the omentum, becaufe it feems to float upon the inteftines.

Error loci—An error of place, either in the folids or fluids of the body.

Errhines—A name given to thofe fubftances which, when fnuffed up the nofe, promote a difcharge of mucus. They are likewife called fternutatories.

Ery-

Eryſipelas—St Anthony's fire; by ſome called the roſe.

Eructation—Belching, or the breaking of wind from the ſtomach.

Eruption—A breaking out, or a ſudden appearance of puſtules on the ſkin.

Eſchar—In ſurgery, is a hard cruſt or a ſcab on the fleſh, formed by the application of a red hot iron; a cauſtic, or ſome ſharp corroding humour of the body; a cruſt or ſcab on the fleſh; a ſcar.

Eſcharotic—Medicines ſo called, which, when applied to the fleſh, form a hard cruſt or eſchar, that ſkin over a wound.

Eſſence—In medicine, the chief properties or virtues of any ſimple or compoſition collected into a narrow compaſs.

Eſ-

Effential—An epithet given to certain preparations of falts and oils.

Ethmoid—The name of a bone which is placed at the back and upper part of the frontal finus, between the two orbits of the eyes. It is a fieve like bone, and generally much affected in that difeafe called the glanders in horfes.

Evacuation—Any difcharge from the body.

Evaporation—Is a diffipation, drying, &c. of the finer parts of any fluid, by means of the heat of the fun or of fire.

Event—The termination of a difeafe either in health or death.

Exanthemata—Any kind of puftules or eruptions on the fkin.

Ex-

Excrefcence—Any thing which grows preternaturally upon any part of the body.

Excretory—A name given to certain ducts or canals which fecrete any humour from glands.

Excreta and *retenta*—The former means things that are caft out of the body; the latter, things that are retained.

Excifion—The cutting off any extraneous or morbid part.

Exfoliation—That procefs in nature by which the dead parts of a bone feparates from the found.

Exercife—Moderate labour or exercife of the body, for the benefit of health.

Excoriation—An abrafion or lofs of fkin.

Excrement—Whatever is difcharged, or requires to be difcharged as noxious, ufelefs, or corrupted, from the natural paffages of the body.

Exoftofis—Is a preternatural excrefcence of a bone, or a tumor on a bone.

Exotic—Means any thing brought from a foreign country.

Expectorants—Medicines which promote a difcharge of mucus from the lungs, or from the wind-pipe.

Expiration—Is the action of difcharging the air from the lungs that has been drawn in by infpiration.

Expreffion—A mechanical operation by which the juices of plants, &c. are obtained.

Extenuation—Wafting, or great leannefs of body by difeafe.

Ex-

Extenſors—This name is given to ſeveral muſcles, whoſe office is to extend the parts to which they belong.

Extravaſation—This is applied to any of the fluids of the body which are out of their proper veſſels.

Extremities—The moſt remote parts of the body.

Exuviæ—Sloughs or ſkins thrown off from any part of the body.

Exulceration—Beginning eroſions, which wear away the ſubſtance and form an ulcer.

F.

F.

Faculty—In animals, is the power of performing any aɑtion of the body. In man, they are far more extenſive.

Fames—Hunger. When animals die for want of food, their death is not directly the conſequence of hunger, but by that kind of fever which is called putrid, and which is excited by the blood's loſing its bland conſiſtence, from the want of the uſual ſupplies of nouriſhment.

Farina—The powder of meal or flour.

Fat—An animal oil, too well known to require any deſcription.

Farcy

Farcy—A loathſome diſeaſe to which horſes are ſubject, beginning with hard knots and puſtules which ſometimes ſpread over the ſurface of the whole body, and terminates in foul ulcers, attended with ſwelling of the parts.

Fauces—The jaws or throat.

Fæces—Excrement diſcharged from the body.

Febris—Fever. Fevers are divided into a number of ſpecies; as the inflammatory, the nervous, the putrid, &c. Fever ſeems to be a general diſorder of the whole animal ſyſtem, and may be defined a ſymptom of ſome diſeaſe either manifeſt or latent, attended with particular ſymptoms peculiar to fevers in general, as great heat, diſordered pulſe, &c. which attend them in their various ſtages.

Fe-

Febrifuge—Medicines recommended in fevers.

Fermentation—Certain changes produced in ſacharine vegetable ſubſtances, whereby vinous ſpirits are produced.

Ferrum—Iron. A metal well known for various purpoſes, on account of its malleability. It is likewiſe uſed as a medicine: the preparations of it are called chalybs or chalybeate.

Fibre—In anatomy, means a ſmall thread or filament without a cavity, or at leaſt without a viſible cavity, whoſe breadth and thickneſs bears a very ſmall proportion to its length.

Fire—The element of fire, which, like air, pervades all bodies, whether animate or inanimate, and bears a part in their compoſition.

pofition. In animal bodies, it is the caufe of heat, being abforbed by the lungs from the air into the blood on infpiration.

Fimbria—Any thing that is jagged or fimbriated on the edges, like to the leaves of trees.

Filament—A body appearing in the form of a flender thread.

Fiſſure—Means a crack or opening, or a feam in any part.

Fiſtula—Is a kind of ulcer with a narrow orifice, which, together with its internal furface, is for the moft part callous.

Flatulency—Air or vapour rarified by the heat of the parts in which they are confined, caufing diftenfion and pain.

Flexor—A name applied to feveral muf-

cles,

cles, from their office, which is to bendthe parts to which they belong.

Flux—May either mean a difcharge from the body, or fometimes a flow of humours to any part.

Fluids—The term fluids is applied to all thofe liquids in an animal body, which, in a healthy ftate, readily admit of a change of place, whether by circulation, fecretion, or excretion; each of which are diftinguifhed by a particular name, as lymph, ferum, fweat, urine, &c. Some are clear and colourlefs, others more or lefs tinged; fome are falt, and others infipid.

Fœtus—The young of all viviparous animals whilft in the womb.

Follicle—A little bag which contains matter.

Fo-

Fomentation—A partial bathing with warm water or other warm liquors.

Foramen—A term frequently met with in anatomy, and ſignifies a hole or opening.

Formulae—A preſcribed or general form. A technical term in medicine.

Friction—Rubbing. A neceſſary operation to the ſkin of horſes.

Fumigation—The application of medicines to the body in fumes or ſmoak; they are inſpired into the lungs, for curing certain diſeaſes there, and uſed as a preventative in contagious air.

Functions—The actions or functions of the body are the determinate action or operation of any organ by which it contributes to the ſupport of life and health. The functions of the body are divided into the

 vital,

vital, natural, and animal. The vital functions are thofe which are abfolutely neceffary for life. The natural functions are thofe which are employed in the preparation and diftribution of nourifhment, &c. The animal functions are thofe that are performed by the will, as mufcular motion, and all the voluntary motions of the body; likewife the fenfes of touch, tafte, fmell, fight, hearing, &c.

Fungus—A fpongy excrefcence which arifes in wounds and ulcers, commonly known by the name of proud flefh.

Furor uterinus—A preternatural irritability of the uterus and pudenda in females at certain feafons of the year. They are then faid to be in feafon for the male.

Fufion—The reduction of folid bodies into a ftate of fluidity by fire.

G.

G.

Ganglion—In anatomy, means a knot frequently to be met with in the courſe of the nerves; for, wherever any nerve ſends out a branch, or receives one from another, or where two nerves join together, there is generally a knot or ganglion. It is likewiſe called a plexus.

Gargle—A liquor with which the throat is waſhed when it is inflamed or ulcerated.

Gas—Any elaſtic aeriform fluid.

Gangrene—A beginning mortification.

Gaſtric

Gaſtric—The name of certain arteries and veins about the ſtomach.

Gaſtric juice—Is a thin pellucid juice which diſtils from certain glands in the ſtomach for the digeſtion of the food.

Gelatinous—Any thing of the conſiſtence of jellies, gums, or mucilage.

Generation—The act of begetting or producing.

Geſtation—Is the progreſs of the fœtus from the time of conception to that of birth.

Gland—Is, in general, an organic ſubſtance of a circumſcribed figure, framed ſo as to ſeparate from the blood a liquid different from and unlike the blood. There are glands of various kinds, ſome more ſimple, others more complicated, and which

bear

bear different names. Glands are roundiſh bodies, ſeated in the cellular membrane, generally near the large veſſels; their ſubſtance is firm, and of various colours.

Glanders—A diſeaſe in horſes, attended with a preternatural diſcharge of mucous matter from the noſe, and a ſwelling of the maxillary glands.

Glans—The extremity of the penis.

Glottis—Is the narrow ſlit at the upper part of the aſpera arteria or windpipe, and is covered by the epiglottis when the breath is held in, and when the food paſſes over it to be ſwallowed. The glottis modulates the voice.

Gluten—Is that glutinous ſubſtance which is ſaid to keep earthy parts of bones, &c. together. In very young animals, as in the fœtus, this gluten is ſuppoſed to form about two thirds of the ſubſtance of the bones;

bones; and in animals more advanced, nearly one half of the bones are gluten. This gluten is principally compofed of oil and water.

Gramen—Grafs, the common herbage for cattle, and one of the beft folvents for thofe concretions that are formed in the ftomachs of thefe animals, on their being long fed on dry food, and alfo for correcting the blood and juices; of which we have daily experience, in its renewing both folids and fluids in poor emaciated cattle.

Granulation—The rifing of the flefhy parts in ulcers, in a healing ftate, when they are faid to granulate new flefh. It means alfo the reduction of metals into fmall grains.

Gravel—Any hard gritty matter like fand, frequently found in the kidneys and bladder, and difcharged by urine.

Griſtles or *cartilages*—Are ſolid, ſmooth, white elaſtic ſubſtances, which cover the ends of jointed bones. They are between the hardneſs of bone and that of a ligament.

Grumous—Any liquor that is thick or cloated.

Guſtus—The taſte upon the tongue. This ſenſe is performed by the papillæ on the tongue, which are very prominent in hungry animals, when the tongue is put out to taſte any body. In dead animals, theſe almoſt diſappear.

Gutta ſerena—A diſeaſe in the internal part of the eye.

H.

H.

Hæmatites—Blood ſtone; ſo called from its ſuppoſed virtue of ſtopping blood.

Hæmoptyſis, *hæmoptoe*—A diſcharge of blood from the lungs.

Hæmorrhagy—Implies a loſs of blood, whether from a ſpontaneous diſcharge from the blood-veſſels, or from external accidents.

Hæmorrhoids—The piles in the human ſubject.

Hæmorrhoidal—The name of certain arteries and veins about the anus.

Hæmoſtaſia—A general ſtagnation of blood from a plethora.

Hair

Hair—The external covering of the bodies of all quadrupeds. The hair, hoofs, claws, and horns, are appendages of the ſkin. From the appearance of the hair, which is called the coat of animals, we can form a pretty exact opinion of the good or bad habit of the body.

Hectic—An epithet for that ſpecies of fever which accompanies the abſorption of pus or matter into the circulating ſyſtem.

Helix—One of the external parts of the ear.

Hemiplegy, or *hemiplegia*—A palſy, in which one ſide of the body only is affected.

Hepatic—This term is applied to any thing belonging to the liver.

Hepatic ducts—Of which there are two, the cyſtic and hepatic. The cyſtic, in the human body, contains part of the bile in the gall-bladder; but in horfes, who have no gall-bladder, the bile flows conftantly through the hepatic duct into the duodenum.

Hepatitis—An inflammation of the liver.

Herbs—Such plants whofe ftalks die every year. Thofe whofe roots continue only one year are called annual; thofe who continue two years are called biennial; thofe who continue many years are called perennial.

Hermetic feal—In chemiftry, is the clofing or fhutting up the mouth of any veffel with care and exactnefs, to prevent evaporation, or the accefs of external air.

Hermaphrodite—One who is fuppofed to be of both fexes.

Hernia—An opening or rupture where

part

part of the abdominal contents are forced through the interſtices of the muſcles.

Herpes—Tetters; thoſe diſorders that creep and ſpread on the ſkin.

Hippomanes—That fleſhy ſubſtance which ſometimes adheres to the forehead of a new foaled colt.

Homogeneous—All of a kind, or uniform body or mixture.

Humour—Is a general name for any fluids in the body; but, in a morbid ſtate, it is applied to thoſe diſorders attended with vitiated or extravaſated fluids.

Hydatids—A name given to thoſe tranſparent bags which are ſometimes found, on diſſecting bodies, adhering to the different viſcera, as the lungs, liver, &c. They contain ſerum or coagulable lymph.

Hy-

Hypochondria—That part of the abdomen on both ſides which lie under the ſpurious or falſe ribs.

Hypogaſtric—Is the lower region of the fore part of the belly.

Hydrargyrus—Quickſilver, or the preparations of mercury.

Hydrocele—A dropſy in the ſcrotum, and is a ſpecies of anaſarca, to which horſes are very ſubject.

Hydrops—A dropſy, which bears different names, according to its ſituation in the body or part affected.

Hydrophobia—A name given to that ſpecies of madneſs cauſed by the bite of a mad animal.

Hydrothorax—A dropſy in the thorax or cheſt.

I.

I.

Ichor—Alſo called ſanies. It is a thin but acrid fluid, which diſtils from wounds, ulcers, or from the pores.

Icterus—The jaundice; a diſeaſe which proceeds from a vitiated ſtate of the blood and humours, from the bile regurgitating, or being abſorbed into it, by which the functions of the body are injured.

Idiopathy—A primary and peculiar affection of any part.

Idioſyncraſy—Every individual, both of men and animals, have a ſtate of health peculiar

culiar to themſelves ; and as individuals ſeem to vary from each other both with reſpect to the ſolids and fluids, although each may at the ſame time be in a ſound ſtate of health, this forms a peculiarity of conſtitution, which is called idioſyncraſy, or peculiar temperament.

Ignis—The Latin of fire. That element which, like air, pervades all bodies, whether animate or inanimate, and makes up a certain portion of their conſtituent parts.

Ilium—A name of one of the ſmall inteſtines. It is likewiſe applied to certain bones in the neighbourhood of theſe inteſtines.

Impregnation—Implies the female being impregnated by the male. Impregnation of plants, &c.

In-

Incifores—The name of the anterior teeth in each jaw, from their ufe in cutting the food.

Incruftation—In furgery, is the forming of a cruft or efchar upon any wounded part.

Indication—Is a conclufion arifing from reafoning on particular fymptoms or figns of difeafe. The indication of cure in all difeafes is to remove the proximate or immediate caufe.

Indigeftion—An improper concoction of the food or humours.

Inertiæ vis, or *vis inertiæ*—Means when the powers of the conftitution are torpid or inert, and, for want of their exertion, leave the habit, both folids and fluids, in a ftate almoft of inactivity.

Ino-

Inominata—A term applied to ſome arteries, nerves, &c. becauſe they have had no proper name fixed to them. The large bone which forms the upper or back part of the pelvis, although compoſed of three bones, is called oſſa inominata.

Infection—Contagion, or any thing ſaid to be infectious.

Inflammation—Is an accumulation of blood to any part of the body, whether external or internal, local or univerſal, by an increaſed circulation of the blood, from various cauſes. The principal effects of inflammations are heat, pain, ſwelling, an accelerated pulſe, a dryneſs of the ſkin, and itching.

Infuſion—Is ſteeping any ingredient in a proper fluid, or any medicine that has been prepared by this action.

In-

Inguinal—The name of any thing belonging to the groin, as the glands, &c.

Injection—This term is applied to glyſters or clyſters, by which medicines in a liquid ſtate are conveyed to the moſt latent cavities of the body, by means of proper inſtruments. In anatomy, the term injection means the filling up of the blood-veſſels, &c. with coloured wax or varniſh, in order to trace out their courſe, ſhapes, and ramifications throughout the body. Quickſilver is likewiſe employed for the finer veſſels.

Induration—Means any gland or fleſhy ſubſtance growing hard.

Indigeſtion—Food or aliment not digeſted in the ſtomach.

Indolent—This term is applied to tumors that are very ſlow in coming to maturity,

turity; hence they are called indolent tumors.

Inſpiration—Is the drawing in of air into the lungs.

Inſpiſſation—The taking away the humid or watery parts from any ſubſtance by evaporation.

Integuments—The outward ſheath or covering of parts, ſuch as the cuticle, rete mucoſum, cutis, and the cellular membrane.

Intercoſtal—Any thing between the ribs, whether muſcles, arteries, veins, or nerves.

Intermittent—Is when a fever quits the patient for a time and then returns.

Interſtices—A ſpace between the muſcles.

In-

Introſuception—Is a preternatural ingreſs of one portion of an inteſtine into another, or a reduplication of the inteſtine.

Inteſtines—Likewiſe called the guts. They are divided into the ſmall inteſtines and the great. The ſmall are the duodenum, jejunum, illium. The great are the cæcum, colon, and rectum.

Iris—The fore-part of the choroid coat in the eye is ſo named, becauſe of the variety of its colours.

Irritability—Is applied both to the healthy and morbid ſtate of the body. Thus, irritation is a ſpecies of ſtimulus, exciting to action in the healthy ſtate, as in the muſcular fibres, when excited to motion by the will of an animal. Irritation, in a morbid or diſeaſed ſtate, implies ſomething acrid or ſharp. Irritating the parts, for inſtance, a

mot

mot in the eye produces an irritation on the parts, fo as to produce inflammation. Certain medicines irritate the bowels to throw off their contents by ftool, and which may be followed by fpafm, convulfion, inflammation, and gangrene. Irritation is likewife produced by an overfulnefs or overftretching of the veffels or vifcera; and this diftenfion, or continued irritation, followed by inflammation, attended with any confiderable degree of violence, produces fever, attended with a quick pulfe, &c.

Ifchury—Is a ftoppage or fuppreffion of urine.

Iffue—In furgery, is an opening made under the fkin, in order to create a difcharge of matter.

Inhale—Is the drawing into the lungs any

any thing that is without the body, whether air or vapour.

Inflation—Means to inflate or blow up with air; or any flatulent tumor, arifing from air or wind admitted into the cellular membrane.

Inorganic—Not properly formed.

Inofculation—The union by conjunction of the extremities of veffels, as the inofculation of the arteries with the veins.

Influenza—Epidemic catarrhal diforders, attended more or lefs with fever.

J.

Jaundice—A diſorder in the liver.

Jalap—A ſpecies of the convolvulas; the root of which is of a purging quality.

Jecur—The liver. It is alſo called hepar. This viſcus lies immediately below the diaphragm, on the right ſide, is divided into lobs. The office of the liver is to ſecrete the bile from the blood.

Jugular—A name given to the large veins in the neck.

Jejunum—The ſmall inteſtines which begins where the duodenum ends.

Ju-

Juvantia and *lædentia*—Two technical terms ufed in medicine. The former implies, whatever relieves under a diftemper, whether food or medicine. The latter, whatever offends or is found hurtful.

Jefuits bark—Likewife called Peruvian bark; a medicine of great ufe in any tendency to mortification, and a great ftrengthener of the ftomach, and one of the beft medicines called tonics.

K.

K.

Kali—A ſeà-weed growing on the ſea-coaſts, called alſo kelp, from which an alkaline ſalt is obtained by burning.

Kidneys—Are two roundiſh oblong flattened bodies, ſituated on the lumbar vertebræ, or ſmall of the back. Their office is to ſecrete the urine from the blood ; after which, it is conveyed by the ureters into the bladder.

L.

L.

Labia—The lips.

Labyrinth—The ſecond cavity of the ear.

Lac—The Latin of milk; a fluid which is prepared and ſecreted in the bodies of animals, but not completely elaborated into an animal nature. It differs very little from the chyle when it is taken up by the lacteals.

Lactea febris—The milk fever, which frequently attacks women ſoon after delivery. Cows are likewiſe ſubject to it when cruelly kept up in order for ſale to make a great ſhow of milk.

Lachrymal—The name of certain glands, ducts, and nerves about the eyes.

Lædentia—Medicines or ſubſtances which injure the health or exaſperate a diſeaſe.

Lacunæ—Any drain or furrow, as the excretory ducts and glands in the vagina and urethra.

Lactea vaſa—The lacteal veſſels. The abſorbents of the bowels, that ſuck up the chyle or nouriſhment from the food, and convey it to the thoracic duct; from thence it is carried to the blood.

Larynx—The upper part of the wind-pipe, called aſpera arteria.

Laudanum—Preparation of opium in ſpi-rit of wine.

Lamina or *lamela*—Thin plates.

Languor

Languor—Lownefs; debility of fpirits.

Laxatives—Gentle purgatives.

Lentor—A vifcidity or fizinefs of the fluids; a fluggifhnefs of circulation.

Leprofy—A difeafe of the fkin.

Leannefs—Meagre, or thin of flefh.

Lethargy—Is an heavinefs and perpetual difpofition to fleep. This diforder is generally fymptomatic, and often the attendant of fever.

Lens—The name of one of the humours of the eye, called the cryftalline lens.

Levators—The name of certain mufcles. They are likewife called elevators from their offices.

Leucophlegmatic—Phlegmatic or watery fwellings; frequently the beginning of anafarca.

ſarca. Sometimes this word is uſed for emphyſema. Leucophlegmatic means likewiſe that habit of body when the patient is much ſubject to oedematous ſwellings in the legs.

Lientary—Is a ſpecies of diarrhœa, in which the aliments are hurried through the body in a nearly indigeſted ſtate.

Ligament—Is a white, tough, flexible body, thicker and firmer than a membrane, and not ſo hard or ſolid as a cartilage; They have no cavity nor hollowneſs in their ſubſtance, little elaſticity, and ſtretched with difficulty. They ſerve to articulate the bones on the joints. There are likewiſe annular ligaments, which bridle the tendons of the muſcles which paſs through them in different parts of the body.

Ligature—A bandage, or any thing tied round a limb.

Lingual

Lingual—Any thing about the tongue, whether ducts, glands, nerves, arteries, &c.

Lithiafis—The gravel or ftone in the bladder or kidneys.

Lithotomy—Cutting for the ftone.

Lixivium—A ley, or water impregnated with the falts of burnt vegetables.

Lochia—Purgations of the uterus after birth.

Local—Difeafes that have their feat in one particular part of the body only.

Lotion—An external fluid application to any part.

Lobules—Small divifions or lobs. Lobs of the lungs. The fmall cells of fat are call-ed lobuli adipofi.

Lumbral

Lumbral—The name of the back bone, or lumbral vertebræ. The arteries, veins, nerves, and muſcles belonging to them are called vertebral.

Lumbrices—The long earth worm. A ſpecies of theſe vermin infeſt the bowels both of men and animals.

Luxation—A diſlocation of the bones from their ſockets.

Lubricate—To make ſlippery or ſmooth.

Lungs—The organ of inſpiration and exſpiration.

Lymph—Is a pellucid, inſipid, pure liquor; the more ſubtile parts of which affords the matter of the fluid of the brain, ſpinal marrow, nerves, and alſo the ſeminal fluid. The gelatinous parts of this fluid nouriſh all the ſolids of every kind; and

its

its finer aqueous parts are carried into the blood by the lymphatic veſſels.

Lymphatics—Certain veſſels which abſorb or take up fluids from every part of the body, and convey them to the thoracic duct; from thence they are conveyed into the blood.

M.

M.

Maceration—The infuſing or ſoaking ingredients in water or other fluid to extract their virtues.

Malignity—Malignant; a term given to particular fevers.

Mania—Madneſs; delirium in fevers; or communicated to the ſyſtem by the bite of mad animals, as dogs, &c.

Mamillary—Belonging to the breaſts.

Maraſmus—Is a waſting of the body, in a conſumption, or laſt ſtate of that diſorder. It is likewiſe called atrophy.

Maſ-

Maſtication—The action of chewing the food or aliment between the teeth. In maſtication, the oily, aqueous, and ſaline parts of the food are intermixed the one with the other. The ſmell and taſte of different ingredients are loſt in one, which, by the ſolution of the ſaline parts with the ſaliva, renders the food ſlavourable; but ſuch particles as are more volatile and penetrating, being directly abſorbed by the bibulous veſſels of the tongue and cheeks, enters immediately into the blood-veſſels and nerves, ſo as to cauſe an immediate recruit of ſpirits and ſtrength.

Materia medica—Are all thoſe materials afforded by nature and art, which have been found, from practice and experience, uſeful in curing the diſeaſes of the human and animal body.

Matter—That thick fluid fubftance which is difcharged from a wound, ulcer, or abfcefs, and is called good or bad according to its appearance or quality.

Maxillary—A term given to finufes, bones, glands, and nerves, &c. about the cheeks and jaws.

Meatus—A duct or paffage, or any canal which conveys a fluid. The paffage into the ear is called meatus auditorius.

Mediaftinum—Is that membrane which lines the cavity of the breaft; called likewife the pleura: It goes from the middle of the breaft to the fpine or back bone; it proceeds from thence, covers the lungs, paffes to the fternum, and forms a complete bag on each fide. The mediaftinum contains in its duplicature, the heart, the pericardium, the vena cava, and the œfophagus.

Me-

Medicine—Is the art of preferving prefent health, or reftoring it when loft.

Medulla—Marrow. In anatomy, it has various fignifications. The white fubftance of the brain is called medulla or medullary part, to diftinguifh it from the cortical. The continuation of the brain, &c. in the fpine is called medulla fpinalis.

Meliceris—The name of certain tumors from the matter they contain, which has the appearance of honey.

Membrane—Is a thin web-like fubftance, compofed of a great number of pliable fibres interwoven together. They differ in thicknefs according to the number of their planes. Thefe planes are called laminæ or plates. The term membrane is applied differently; the cellular membrane, the mucous membrane, and the common membranes.

Me-

Meninges—The membranes of the brain, which are two, the dura mater and pia mater.

Mercurial—An epithet given to all the different preparations of mercury or quick-ſilver.

Mephitis, *mephitic*—A poiſonous exhalation, or what the miners call a damp. The word mephitis is uſed to ſignify noxious, hurtful, injurious, &c. It is likewiſe applied to fixed air.

Meſentery—Is a duplicature of the peritoneum, connected by a cellular membrane, expanding and receiving the inteſtines as in a ſling. That part of it which ſuſtains the greater inteſtines is called the meſocolon; It prevents the guts from twiſting, and keeps them in their proper places.

Me-

Mesocolon—That part of the mefentery which belongs properly to the great inteftines.

Metastasis—Signifies a tranfpofition or change of place of fome humour or difeafe to fome other part of the body.

Miasma, *miasmata*—Implies certain particles floating in the atmofphere, which are inhaled into the lungs both of men and animals, and produces fevers. The miafma, fo univerfally the caufe of epidemic fevers, arifes from marfhes or moift grounds, acted upon by heat. The effluvia or fteams arifing from difeafed bodies may likewife be conveyed in this manner, as they are fometimes retained in an active ftate for a very long time, according to the ftate of the air.

Mi-

Miliary—A term applied to fevers where ſmall puſtules or veſicles appear on the ſkin.

Milk—Is a thin ſerous liquor, the colour and conſiſtency of which is well known; but many people may be ignorant of ſome of its qualities for young animals. It is ſecreted from the blood by certain glands, and depoſited in the udder previous to or at the birth of their young, for their nouriſhment. This aliment nature hath provided for all new born viviparous animals of the more perfect kind, to ſupport them till they are able to ſhift for themſelves, and till their teeth grow, by which they may be enabled to cominute or break down that more ſubſtantial food which nature has provided for their reſpective ſpecies at a more mature age. The firſt milk that comes after birth is called beeſting; it is of

a

a ſcouring and looſening nature, and ſerves to expel the excrementitious fæces or meconium in the new born animal. Nature or inſtinct operates ſo ſtrongly in new born animals, that they almoſt immediately apply to the teat of the mother for this nouriſhing liquor.

Millipedes—Wood lice; ſo named from their numerous feet.

Minerals—Earths, ſtones, or metals.

Molares—The name of the large teeth on each ſide of the jaw.

Morbus—A diſeaſe, or ſuch an alteration in the properties of the ſolids and fluids, or an affection of ſome part or parts, or the whole of the body, by which the whole ſyſtem is injured or diſturbed, or the action of a part impeded, perverted, or deſtroyed, attended with peculiar ſymptoms adapted

to

to the nature of the affection and parts affected; or certain appearances deviating from health, from ſome general or partial affection, by which the ſyſtem in general or in part is oppreſſed or disfigured. Diſeaſes are divided into two claſſes, the acute and the chronic.

Moon eyes or *lunatic eyes*—In farriery, a diſeaſe in the eyes, ſaid to be influenced by the moon.

Mor-founder—A term in farriery, which is applied to a diſorder in horſes; it is alſo called foundering in the body and molten greaſe.

Mooring or *moor-ill*—A term given to a diſorder in cattle when they piſs blood.

Mortification—In ſurgery, a corruption and deadly decay of any part, by which its texture is deſtroyed from the putrefaction which takes place.

Mo-

Motion, animal—The act of moving; muscular action.

Mucus—Is that colourless, insipid, viscid fluid which is secreted from the mucous glands, throughout the whole internal cavities of the body, from the mouth to the anus. It is likewise the covering for the surfaces of all the membranes in the body that are exposed to any extraneous matter. It is composed of coagulable matter and water. It defends the membranes from being too much stimulated by what is applied to them. Although in a healthy state, it is a mild, bland, insipid, inodorous fluid; yet, when its secretion is suddenly increased by disease, instead of a simple mucus, it becomes a watery fluid, containing the saline parts of the blood; and in consequence of them, it becomes highly stimulating, loses its bland quality of defending the membranes from acrimony. Its colour is often changed to a whitifh or a greenifh yellow, acquiring a fœtid fmell, and puts on, in fome refpects, the appearance of pus or matter.

Mucilage—Means any vifcid glutinous liquor. It is alfo that humour which is feparated from glands about the joints, in order to their eafy motion.

Mufcles—Are thofe bundles of flefhy fibres by which the motions of all animal bodies are performed. A mufcle hath the power of contracting and lengthening itfelf, and is the chief inftrument of voluntary and involuntary motion. Mufcles are of great variety of fhapes and forms. There are likewife hollow mufcles, as the heart, which, when it contracts itfelf, preffes upon the blood, and forces it out into the arteries. The ftomach and bladder are in fome mea-

fure

ſure hollow muſcles ; they expel their contents by their contraction. On the other hand, if the fibres of a muſcle return upon themſelves in the form of a ring, when they contract, they diminiſh the area or opening within that circumference. Muſcles of this denomination, which are employed to ſhut cavities, are called ſphincters, as in the anus, &c. A muſcle is divided into three parts, its head, its belly, and tail. The head is the tendinous part which is fixed on the immoveable joint, and is called its origin. The belly is the middle fleſhy part, whoſe fibres are the true muſcular fibres, and have the power of motion. The tail is the tendinous part, which is inſerted into the part to be moved by it, and is called its inſertion.

Mute—Dumbneſs ; the want of power to articulate words.

Myopia—Shortneſs of ſight.

N.

N.

Narcotics—Likewiſe called anodynes; that claſs of ſoporiferous medicines which induce ſtupefaction.

Nares—The noſtrils.

Naſal—Belonging to the noſe.

Nauſea—Sickneſs, qualm, loathing, a propenſity to vomit.

Nephritis—A ſuppreſſion of urine from inflammation in the kidneys, or attended with increaſed ſecretion of urine.

Nerves

Nerves—Are thofe productions of the brain which are the means of fenfe and motion in every part of the body. They are continuations of the medullary fubftance of the brain, and appear like white foft cords, without any cavity difcernible even by the fineft glaffes.

Nervous fyftem—Includes the medullary part of the brain and the fpinal marrow, with all the cords and filaments which arife from either throughout the whole body.

Neurofis—Nervous difeafes.

Neutral—A term applied to fuch falts as are formed of fuch proportions of acids and alkalies that neither of them predominate in the compound.

Nitre—Called alfo fal petre. It is a neutral falt, formed by the coalition of the common

mon vegetable fixed alkaline ſalt with a peculiar acid.

Non-naturals—A term frequently met with in medical books; but they ought more properly to be called res neceſſariæ, or things abſolutely neceſſary, as no perfect animal can live without them; they are reckoned ſix, viz. air, meat, drink, ſleep, waking, motion, and reſt, things excreted and things retained. All theſe things affect animals without entering into their compoſition or conſtituting their nature; at the ſame time, there are very few diſeaſes which happen either to men or quadrupeds, in which an error in one or more of the non-naturals have not an influence as a cauſe of ſuch diſeaſe.

Noſology—Is an explication of diſeaſes, or a diſcourſe concerning the nature and properties of them, dividing them into claſſ-

es,

es, orders, genera, ſpecies, and varieties; by which means accurate diſtinctions are formed, and much confuſion avoided.

Nutrition—The natural effects of food after it has been digeſted in the ſtomach, &c. for the nouriſhment and ſupport of the body.

Nucleus—The kernal of ſtone fruit, or any thing of the like nature.

Nymphæ—Two prominent folds of the ſkin about the orifice of the vagina.

O.

O.

Obesitas—Obesity; corpulence or fatness.

Obstetric—Midwifery.

Obstipation—Constipation, costiveness.

Oeconomy—The animal oeconomy is the conduct of nature in preserving animal bodies.

Obstruction—In physiology, is when the fluids cannot pass through the vessels of a particular part or parts, and which may happen from the increased viscidity of the fluid, or a diminution of the capacity of the vessels, or a concurrence of both these causes.

Ob-

Oblongata, or *medulla oblongata*—The medullary part of the brain which paſſes through a hole in the ſkull down through the vertebræ of the neck and back.

Oedema—Signifies a ſerous tumor ſeated in the cellular membrane, and forms partial anaſarcus ſwellings; alſo ſerous ſwellings in the legs.

Oedematous—Is a name given to tumors or ſwellings which come on ſuddenly, or when any of the glands are diſeaſed, the lymph cannot paſs towards the heart, but goes to the limbs merely from gravitation, and, from the want of due abſorption, the limbs ſwell. This term oedematous is applied to thoſe ſwellings of the legs that come on very ſuddenly, attended with inflammation of the ſkin, very much reſembling what is called the eryſipelas in the human body.

Oesophagus—The gullet; ſo called becauſe it carries the food after maſtication into the ſtomach.

Officinals—Is an appellation given to ſuch ſubſtances as are directed to be kept in ſhops for medical purpoſes.

Oil—Oils are either animal, vegetable, or mineral. Animal oils are the fat of animals. All animal ſubſtances yield oil by diſtillation. Vegetable oils are principally procured by expreſſion, diſtillation, or boiling. The mineral oils are obtained ſpontaneouſly and by diſtillation.

Olfactory—The name of thoſe nerves which induce ſmell.

Omaſum or *omaſus*—The third ſtomach of ruminating animals; ſometimes called abomaſum.

Omen-

Omentum—Is that net-like fatty ſubſtance which covers the inteſtines. Its uſe is, by its fat, to lubricate the parts adjacent, and prevent adheſions of the inteſtines, and as a preparatory organ for the bile. It is likewiſe called epiploon.

Opake, *opaque*—Not tranſparent.

Opiates—Medicines compoſed of opium.

Opiſthotonos—Is a general ſpaſm over the whole muſcles of the body, in which the whole trunk is rigid, ſtiff, and immoveable. It is likewiſe called tetanus.

Ophthalmia—Is an inflammation of the membranes which inveſt the eyes, particularly the tunica adnata.

Optic—The name of thoſe nerves, &c. which go to the eye.

Orbit—The orbit of the eye, or circular cavity in which the eye is placed.

Orgasmus—To be in condition for the male, as some female animals are at particular seasons of the year: it is then called venerial. It also means a violent turgescence of the parts.

Orthopnœa—A difficulty of respiration.

Os—The Latin of bone. Bones consist of a mucilage and an earthy matter. Acids dissolve this earthy matter, leaving the bone of its original shape, but soft.

Ossification—Is the beginning of the growth of a bone or bones, or any animal substance changing into a bone. Ossification is likewise a disease that takes place in different parts of the body, most frequent in the arteries, when part of them ossifies or becomes of a bony substance.

Osci-

Oſcillation—Certain motions in the fibres of living animals, called oſciliatory motions.

Oſteogeny—A diſcourſe on the production of bone under its ſeveral original ſtates.

Oſteography—A deſcription of the ſeveral bones which compoſe the ſkeleton.

Oſteology—A deſcription of the bones.

Ovaria—The part of the body in which impregnation is performed. So called from their reſemblance to eggs; by ſome called the female teſticles.

Ozena—A fœtid ulcer in the inſide of the noſe in the human body. In horſes it is called the glanders.

P.

P.

Pabulum vitæ—The animal heat and animal ſpirits are ſo called as the food of life.

Palate—Is that arch in the mouth which is ſurrounded before by the teeth and gums.

Palliative—Medicines given only with an intent to relieve pains in a fatal diſeaſe.

Palpebræ—The eye-lids.

Palpitation—A preternatural vibration or tumbling of the heart.

Pancreas—The ſweet bread, ſituated under the ſtomach. It ſecretes a juice reſembling the ſaliva, called the pancreatic juice, and

and conveyed by its own proper duct into the duodenum, where it acts as a menſtruum for the ſolution of the food. The pancreatic juice is leſs viſcid than the ſaliva, and contains a larger portion of the ſalts of the blood.

Panniculus adipoſus—The cellular membrane.

Papillæ—Little eminences on different parts of the body, as the papillæ on the medulla oblongata; the papillæ pyramidales on the ſurface of the ſkin. They are longer in ſome parts, as in the fingers of the human body, where they are called villi. The papillæ of the tongue, &c. They are the organs of touch and taſte, being the terminations of the cutaneous nerves.

Paracenteſis—The operation of tapping the belly, for diſcharging water contained in its cavity.

Para-

Paralyſis—The palſy. This diſorder may be either general or partial. In the latter caſe, when one ſide only is affected, it is called hemiplegia. A palſy is an abolition of voluntary motion, or of feeling, or of both. The apoplexy, hemiplegia, and palſy are ſo nearly connected, that they may be conſidered as ſpecies of one and the ſame diſeaſe.

Paraphrenitis—Delirium; alſo an inflammation of the diaphragm, attended with delirium.

Paregoric—An epithet for medicines which relieve pain.

Paronychia—The whitloe, or whitlow, being ſeated near the nail. It is alſo called a felon. It is an abſceſs at the end of the fingers.

Parotis—The parotid glands, ſituated on each ſide of the head, below the ears. They

are

are of the conglomerate kind and fecrete faliva, which is poured into the mouth by their own proper ducts, which enter it by the cheeks.

Paroxyfm—Accefs, or fit of a difeafe; called alfo exacerbation.

Parturition—Labour, or the bringing forth of a child.

Patella—The knee pan, or cap of the knee in man. In horfes it is called the ftiffle.

Pathognomonic—An epithet for a fymptom, or a courfe of fymptoms, that are infeparable from a diftemper, and are found in that only and no other.

Pathologia or *pathology*—It is that branch of medicine which explains the nature of difeafes, their caufes, and fymptoms; for, in order to underftand a difeafe, we fhould consider the morbific causes, parts affected, symptoms, crisis, diagnosis, and prognosis, as this branch of medicine is divided into all these particular heads, and which require the utmost attention.

Pectorals—An epithet given to those medicines which are appropriated to disorders of the breast and lungs.

Pediluvium—Bathing the feet in warm water.

Pelvis—The name for the inferior or back part of the belly, where the bladder and rectum are situated.

Pain—A morbid affection arising from external injuries applied to the body. Internally, pain may be excited from the distention of the vessels in a part already become preternaturally sensible.

Penis—The external part of generation in the male.

Pericardium—That capfule or bag in which the heart is inclofed, and contains a fluid in appearance like ferum a little tinged with blood, which keeps the heart moift.

Pericranium—The name given to that membrane which immediately invefts the bones of the fkull.

Perineum—Is that fpace between the anus and the parts of generation.

Perioftium—That membrane which covers all the bones in the body.

Peripneumony—An inflammation of the lungs. There is another fpecies of it, which is called the fpurious or baftard peripneumony.

Pe-

Periſtaltic—The motion of the inteſtines by which they protrude the fœces. It is likewiſe called vermicular from their worm-like motion.

Peritonæum—That membrane which lines the belly and inveſts all the viſcera contained therein.

Perſpiration, called alſo *tranſpiration*—It is a thin fluid diſcharged from the pores of the ſkin and from the lungs. It is of two kinds; that which is continually tranſuding through the pores of the ſkin is called inſenſible perſpiration, the other ſenſible, as it is viſible to the ſight, and is called ſweat.

Privigilium—Intenſe watching, a ſymptom very common in fevers, and always a bad preſage.

Peſtis—The plague; a putrid fever of the worſt

worſt kind; the moſt violent, rapid in its progreſs, and ſuddenly fatal.

Pharmaceutics—That part of medicine which gives the deſcription of remedies, and teaches the method of rightly exhibiting them.

Pharmacopœia—A diſpenſatory; a book containing rules for the compoſition of medicines.

Pharmacy—Is the art and practice of preparing and compounding medicines.

Phlebotomy—Blood-letting, by opening the vein with a lancet or other inſtrument.

Phlegm—Cold watery humour, or the watery part obtained from bodies by diſtillation or otherwiſe.

Phlogiſton—The inflammable principle in bodies.

Phoſ-

Phosphorus—Chemical preparations which ſhine in the dark.

Phlegmaſia—An inflammation.

Phrenitic—Phrenzy; delirium.

Phthiſis—A conſumption.

Phenomenon—Wonderful or uncommon appearance.

Phyſiology—Is the knowledge of the uſes of the different organs of an animal body, how far they are ſubſervient to perfect life and health, by a ſteady performance of their ſeveral functions, and a regular co-operation with thoſe various organs which conſtitute this complicated machine. Hence, anatomy is a neceſſary introduction to phyſiology.

Pia mater—The thin membrane which covers the brain.

Pi-

Pituitary—The name of a gland; likewife that of the membrane which lines the infide of the nofe and all the cavities of the head.

Placenta—Is a congeries of blood-veffels which adhere to the uterus during geftation, and connected with the fœtus. Called alfo the after birth.

Plaftic—The faculty of forming anew or generating.

Plethora—Is when the veffels are too much loaded with fluids. A plethora may be either ferous or fanguine. In the firft there is little craffamentum in the blood; in the latter too much. In the fanguine plethora there is a danger of fever, inflammation, apoplexy, rupture in the blood-veffels, obftructed fecretions, &c. In the ferous plethora, the body is difpofed to dropfy.

dropſy. A rarefaction of the blood produces all the effects of a real plethora.

Pleura—The membrane which lines the cavity of the breaſt, covers the lungs, the duplicature of which forms the mediaſtinum.

Pleuriſy—An inflammation of the pleura.

Plexus—Net-work, or a complication of blood-veſſels.

Pleuropneumonia—A diſtemper conſiſting of a pleureſy and peripneumony.

Plica Polonica—A diſorder peculiar to the people in Poland, which is the blood-veſſels running from the head into the body of the hairs, which ſtick together and hang down matted and clotted, diſcharging an ichorous humour, painful to the patient and diſguſtful to the ſpectator.

Pneu-

Pneumonia—Is an inflammation of the lungs, the thorax, or the membrane that lines it.

Polypus—Hath different meanings; but, when applied as the name of a difeafe, it means thofe concretions of blood which confift of a whitifh, fibrous, and pretty compact fubftance, fometimes met with in the large blood-veffels after death; but thofe polypufes that require manual operation feem to be more folid, and to confift of a flefhy excrefcence, which frequently grows on the infide of the nofe.

Pores—The pores in the fkin, through which the perfpirable matter paffes.

Polyfarcia—Exceffive fatnefs, or corpulence of body; in fome cafes a fpecies of cachexy, for many difagreeable fymptoms attend it, as flownefs of motion, oppreffion,

 weaknefs,

weaknefs, difficulty of breathing, fweating on the leaft exercife.

Prefage—Foretelling, or prognofticating the iffue of a difeafe.

Prefbytæ—A weaknefs of vifion from old age.

Primæ viæ—The firft paffages; that is, the ftomach and inteftines.

Proceffus, a *procefs*—In anatomy, is a protuberance or eminence rifing out of the larger bones for the infertion of mufcles. They are alfo called condyle.

Procidentia—A prolapfus, or the falling down of any part, as the fundament; a diforder frequent in the human body, from its erect pofture, but feldom occurring in our fubject, from its horizontal pofition.

Pro-

Profluvia—A flux, or increafe of fome natural difcharge, attended more or lefs with fever.

Prognofis—Prognoftic of a diftemper, is the knowledge of the figns by which we prefage or foretell the circumftances that will happen in the courfe of the difeafe.

Prophylactic—The method of preferving health and averting difeafes.

Progreffive motion—The act of going forward; advancing by degrees.

Pulmonary—Any thing relating to the lungs.

Pupil—That opening in the eye which tranfmits the light to the humours of the eye.

Pulfe—That pulfation (or beating, as it is commonly called) in the arteries of living

animals

animals at every contraction of the heart in propelling the blood through the arterial ſyſtem. From this pulſation, combined with the different degrees of velocity, &c. of the pulſe, the practitioner is enabled to form an eſtimate of the caſe of his patient.

Pulvis—Such forms of medicine as may be reduced to powder.

Puncta lachrymalia—Lachrymal points or holes in the inner edge of the eye. They convey the tears, after moiſtening the ſurface of the eye, and carry them into the lachrymal ſac, and then into the noſe.

Purgantia—Purgative medicines are thoſe that increaſe the natural diſcharge of the fœces. They are of different degrees of ſtrength, viz. the lenient or mild, or laxative. The ſtronger kinds, which operate

with

with more violence, are called draftic. Purging medicines are likewife called cathartics.

Pus—The matter which appears on the furface of a wound; alfo that matter which is found on opening well digefted abfceffes.

Puncture—A fmall hole, either natural or artificial.

Puftula—Pimples on the furface of the fkin containing pus or matter.

Putrefaction—In the humours of an animal body, may be either partial or general. It is a fpecies of fermentation in which the heat and fixed air in the fubject are feparated, by which a diffolution of the parts are effected, attended with a fœtor or ill fmell. When a fmall portion of matter becomes putrid,

putrid, it eaſily diffuſes itſelf through a large quantity, like leaven in a paſte. Hence, putrid matter being abſorbed into the body ſoon contaminates the whole ſyſtem.

Pyloris—A name given to the right orifice of the ſtomach.

Pyrexiæ—Febrile or feveriſh diſeaſes.

Q.

Q.

Qualitas, quality—The natural and inſeparable properties of bodies are called their qualities. The relative goodneſs or genuineneſs of medicines.

Quaſſia—A ſtrong bitter wood.

Quitter—A ſwelling on the coronet of a horſe's foot, which breaks out and diſcharges a thin matter, and, if not ſpeedily cured, it degenerates into a fiſtulous ulcer.

Quotidian—Intermittent fever, which intermits, but returns every day.

R.

R.

Radix—A root, or part of a plant by which it naturally receives its nouriſhment. Some roots are fleſhy, others fibrous, and others woody.

Receptaculum chyli—The receptacle of the chyle. It is a membraneous veſicle, of various ſhapes, but generally longiſh. It lies on the right ſide of the aorta, near the vertebræ of the back.

Rectum—The laſt of the inteſtines, ending at the anus.

Reabſorb—Means any fluids, or even matter, that is ſucked up by the abſorbent veſſels, and carried into the circulating ſyſtem.

Re-

Ramification—Branching or ſpreading out, like the branches of a tree.

Regimen—Is the regulation of the diet, with a view to preſerve or reſtore health.

Remitting—Diſeaſes which abate in their violence and returns again.

Renes—The kidneys, which ſecretes the urine from the blood.

Repellents—Medicines which prevent ſuch an afflux of a fluid to any part as would riſe into a tumor, as they cool, dry, aſtringe, and ſtrengthen the parts, and enable them to reſiſt the afflux of fluids lodged there.

Repulſion—That cauſe in nature which oppoſes itſelf to attraction, and repels bodies after they have approached each other to a

 certain

certain point, and prevents their uniting together.

Resins—Exudations from vegetables, as evergreens, tar, turpentine, &c.

Resolution—In a medical sense, is when an inflammation, by some effort of nature, or by means of art, goes off of itself, by some evacuation happening at the time, or by a fever taking place, or transferring the morbific matter to some other part of the body, or it may terminate in some other disease.

Respiration—Is the action of taking in and discharging the air from the lungs.

Restoratives—An appellation given to those medicines that are said to be more adhesive and subtile, whereby they enter into the nourishment of the remotest parts.

Rete

Rete—A congeries of veſſels, or any animal ſubſtance reſembling a net.

Retention—The keeping back, or undue retention of any natural diſcharge.

Reticulum—The ſecond ſtomach of ruminating animals.

Retina—The net-like expanſion of the optic nerve on the inner ſurface of the eye.

Revulſion—The retraction or drawing away any humour in a different way.

Rheum—A fluxion ; a catarrh.

Rheumatiſm—Is a painful diſeaſe affecting the intermediate ſpaces between the joints and muſcles in different parts of the body. Sometimes the viſcera are affected by it. Horſes are more ſubject to this complaint than is generally ſuſpected.

Rhu-

Rhubarb—A plant of the dock kind, whofe root is of a purging quality.

Rigor—A general chillinefs, with a fenfe of coldnefs inwardly.

Rigid, *rigidity*—Stiff, inflexible; a term frequently applied to fibres in that ftate.

Ring bone—In farriery, a callous fubftance that grows immediately above the coronet of the horfes foot, furrounding it like a ring.

Rotula—The knee-pan in the human body; alfo called the patella. It is called the ftiffle bone in horfes.

Ructation—A difcharge of wind by the mouth.

Running thrufh—Is a difcharge of fœtid ichorous

ichorous matter from the cleft in the frog of a horſe's foot.

Rupture—A ſwelling on the belly, where the abdominal contents are protruded thro' the teguments without breaking the ſkin.

S.

S.

Saccharum—Sugar; the effential falt of the fugar-cane, or any vegetable fubftance from which it may be obtained. There are other fubftances which bear that name, as the faccharum faturni, &c.

Sac—A membraneous bag; the name of the blind gut; fo called becaufe it is open only at one end, like a fack.

Sal—Salt; it is a body more or lefs hard, having a remarkable favoury tafte. There are a great many falts ufed in medicine. Sal is a term affixed to all faline fubftances.

Saliva—Is that fluid by which the mouth and tongue are continually moiftened, in their natural healthy ftate. It likewife promotes the digeftion of the food in the ftomach. This faliva is fupplied by glands which fecrete it from the blood, and are called falivary glands.

Sali-

Salivation—Is that extraordinary difcharge of faliva by the mouth which is excited by the ufe of mercury.

Sallenders—A difeafe in horfes affecting the bending of the hock joint, on the fore part, and is a kind of fcurf forming chinks or cracks in the fkin, difcharging a fharp indigefted matter, which fometimes turn into dry fcabs.

Sanguis—Blood ; that red fluid which is contained in the arteries and veins.

Sanative—Medicines which heal difeafes.

Sanies—Matter ; corruption.

Sapo—Soap ; a compofition of oils or fats with alkaline falts, of which there are varieties.

Saponaceous—Soapy, or like to foap.

Sarcocele—Is a firm flefhy kind of enlargement of the tefticle, or fcirrhus tefticle.

Sarcoma

Sarcoma—A fleſhy tumor in any part of the body.

Saturate—To impregnate or be filled with, as when a porous body imbibes as much of any liquid as it can take up; or a ſolution of ſalts in any liquid, that cannot ſuſpend or diſſolve more.

Scabies—The ſcab or itch.

Scapula—The ſhoulder bone or ſhoulder blade.

Scarification—This word implies inciſions made with a knife or other inſtrument.

Sceletos—A ſkeleton; all the bones of an animal freed from the teguments, veſſels, muſcles, &c. and properly connected together, have the general name of ſkeleton.

Scarf-ſkin—The epidermis.

Scammony—A gummy reſin of a briſk purging quality.

Sciatic

Sciatic—A ſpecies of the rheumatiſm when ſeated in the hip joint.

Sclerotic—The outermoſt coat of the eye.

Schirrhus—Is a hard tumor with little or no ſenſation in it. The ſeat of this kind of tumor is generally in ſome glandular part.

Scorbutic—The ſcurvy ; is a chronic diſeaſe of the putrid kind.

Scratches—A diſeaſe affecting the legs and heels of horſes, in dry ſcurf or ſcabs.

Scrophula or *ſcrofula*—The king's evil. Every part of the body may be affected with this diſeaſe, but its immediate ſeat ſeems to be in the lymphatic veſſels. The farcy ulcers in horſes has a great reſemblance to the ſcrophulous ulcers in the human body.

Scrotum—The external covering of the teſticles.

Sebaceus—Liquid ſuet, or ſebaceus humour, is ſupplied by the ſebaceus glands, in order to preſerve the ſenſibility of the ſkin, and to keep it moiſt, by preventing too copious a diſcharge of perſpiration. When this glutinous humour is wanting, as in ſome diſeaſes, the ſkin becomes dry and parched. All the inner membranes of the body are ſupplied with an humour ſimilar to this, in order to prevent their coheſion. In the human body, theſe ſebaceus glands are very diſtinctly ſeen about the noſe, where their contents appear hardened, and at the extremities of their ducts they appear like black ſpots; and, when they are ſqueezed out, they appear like a worm with a black head.

Secretion—Implies all thoſe various kinds of humours that are ſecreted from the blood throughout the whole body, of every denomination.

Sedatives—Are thoſe medicines which

are

are ſuited to diminiſh the motions and power of motion in the body. They are the opposites to whatever is irritating.

Semen—Seed of animals; a term applied to the prolific fluids of animals.

Senna—The leaves of a plant uſed as a purging ingredient.

Senſibility—The quality of being ſenſible, or the perceiving of any viſible thing affecting or cauſing ſome alteration in the organs of ſenſe, or tending towards a morbid ſtate, it may be too much increaſed, and the cauſe of irritability.

Serum—The thin part of the blood. This ſerum contains a coagulable matter, which forms what is called the buff on the blood when it turns cold, after taking it from a blood-veſſel.

Sesamoid—The sesamoid bones. These are the little bones found at the articulations of some joints.

Seton—An issue made in any part of the body, by passing a large needle armed with a cord through the skin, in order to promote a discharge of matter, or passed thro' any tumor, to discharge gradually its contents.

Signs—Are those appearances which manifest the loss of health, or the presence of disease, and relate to the general causes of disease. Signs of a disease are to be taken from general appearances, as looks, motions, gestures, breathing, pulse, heat, dryness, moisture of the skin, &c.

Sinus—A deep hollow ulcer, with a small opening or orifice for its discharge. A sinus

ſinus in a bone is a cavity which receives the head of another bone.

Sitis—Thirſt; that diſagreeable ſenſation excited by a defect of moiſture in the mouth and throat; generally an attendant on fevers.

Solids—A ſolid. In the animal body, the elementary parts of fibres. This term is applied to the fibres in general, as all the ſolid parts are compoſed of them; even the hard bones are compoſed of fibres.

Solution—Matter diſſolved. The diſſolving fluid is called a menſtruum or ſolvent: thus water diſſolves ſalts. Solution of continuity is the definition of a wound.

Sleep—During ſleep the nouriſhment received from food is applied to the decayed or waſted parts, the blood is recruited, and the ſecretions perfected.

Spaſm

Spasm—This term is variously used; but it most general meaning signifies a preternatural contraction of any particular part of the body which are attended with considerable mobility of the system. Spasmodic diseases are distinguished or arranged according as they affect the several functions of the body, whether the animal, vital, or natural.

Spavin—In horses, of which there are two kinds, the bone spavin and the blood spavin; termed so in farriery. The former is a bony excrescence which grows upon the inside of the bone of the hock joint; the latter is an enlargement of the vein on the inside of the hock joint, and ought more properly to be termed a varix.

Specifics—Those medicines which are said

to

to be more infallible than any other in curing particular difeafes.

Spina—The fpine or back bones, which may include the vertebræ of the neck, the back, and the loins.

Spiritus—Spirit; any fine volatile fubftance which exhales from bodies in a given degree of heat is called fpirit. The nervous fluid, by analogy, has been termed fpirit, and called animal fpirit.

Sphincter—The name of thofe mufcles which fhut up the orifice of any hollow part, as in the anus.

Spinalis—Spine of the back; alfo the name of different proceffes, mufcles, arteries, &c. That part of the brain which goes down through the vertebræ of the neck, back, and loins, is called medulla fpinalis.

Splent—In farriery, is a bony excrefcence which grows on the leg or fhank bones of horfes.

Steatoma—A fpecies of tumor or wen, whofe contents appear like fuet.

Sternum—The breaft bone.

Sterility—Barrennefs.

Stertor—Snorting, or violent expiration through the throat and nofe, frequently attending difeafes, as apoplexy, &c.

Stimulus—Whatever excites to action is called ftimulus; thus, every organ whofe function depends upon motion has its natural ftimuli, or occafional caufes, exciting them to action. Whilft thefe ftimuli continue in their natural ftate, the functions, fo far as depends upon them, will be properly performed; but, when their action is

either

either irregular, that is, too great or too weak, difeafes muft follow : thus, the blood ftimulates the heart and arteries to excite their powers in the circulating fyftem ; food excites the action of the ftomach and inteftines ; urine ftimulates the action of the bladder in difcharging its contents. The term ftimulants are alfo applied to certain medicines which increafe the ofcillatory motion of a fibre, or excite the action of the moving fibres in the living animal.

Stomach—That vifcus which receives the food for digeftion immediately after maftication.

Strangury—Is a difcharge of urine in fmall quantities at a time, attended with great pain.

Strain—A term applied to any membranous or tendinous parts that have been overftretched beyond their proper limits.

Strangles—The name of a difeafe to which young horfes are moft liable, and which is a fwelling and inflammation about the throat and jaws, refembling the quinfy in the human body.

Stringhalt—In farriery, is an involuntary jerking motion in one or both of the hind legs of horfes on moving.

Strumous—A glandular fwelling of the fcrophulous kind.

Stylo, ftyloid—The names of certain mufcles, proceffes, &c.

Styptic—A term applied to thofe medicines which are faid to ftop hæmorrhages or bleedings.

Subclavian—The name of certain arteries, mufcles, &c. fituated under the clavicle or channel bone.

Sub-

Sublingual—Implies, under the tongue, the name of arteries, veins, glands, &c. in that ſituation.

Subſultus—Twitching or ſtarting of the tendons; alſo an involuntary ſtarting, or ſpaſmodic contraction of the muſcular parts.

Sudor—Sweat; is only a more violent degree of perſpiration which tranſudes thro' the pores of the ſkin on great exerciſe, in a healthy ſtate of the body. It is likewiſe produced by diſeaſe, and by violent or very acute pain. Sweat conſiſts of a water, a highly exalted oil, a ſalt, and earthy matter.

Sudorific—A name given to thoſe medicines which excite ſweat.

Surbating—A term in farriery applied to thoſe horſes that go tender on their fore feet; they are then ſaid to be beaten or battered in the feet.

Sur-

Surfeit—Overloading the ſtomach with food.

Sympathy—Every part of an animal body hath a ſympathy or feeling with the whole; ſo that if any part is any how deranged in its natural functions, other functions or other parts become affected likewiſe.

Suppuration—The forming of pus or matter in a wound or tumor.

Symphyſis, a growing together—In anatomy, a particular kind of articulation of the joints.

Symptoms—Are the ſigns or appearances preſent in a diſeaſe; yet a ſymptom may be a diſorder at the ſame time; as, when a ſymptomatic fever is produced by a phlegmon or boil, a knowledge of the origin and cauſe of ſymptoms conduces to confirm the prognoſis, and to the certain removal of the diſeaſe.

Syn-

Synchyſis—A diſeaſe in the eye, conſiſting of a confuſion of the humours from a violent blow, producing inflammation, &c.

Synocha—An ardent or inflammatory fever, attended with great irritation.

Synochus—A continual fever, whether of the ardent or putrid kind.

Synovia—Is a lubricating fluid, ſecreted from certain glands in the joints to preſerve their motions eaſy and free. When there is a deficiency of this fluid, from ſevere long continued exerciſe, a crackling noiſe is obſerved in the joints on moving.

Syncope—Fainting.

Syſtole—The contraction of the heart at the inſtant it throws out the blood into the arteries.

Syſtem—Method, arrangement in a regular form.

T.

T.

Tabes—A wafting of the body, with great debility; to confume, wafte, or pine away gradually.

Tænia—Flat, or what are called tape-worms, which infeft the inteftines of the human fpecies. They are the moft trouble-fome, and the moft dangerous of any. They are not known to infeft the bowels of animals, at leaft of horfes.

Tartar—Is an effential acid concrete falt of grapes thrown off from wines to the fides and bottoms of cafks, which, after certain preparations, prove purgative.

Temperament—Something peculiar to the conſtitution or habit of body of every individual, as the ſanguine, when the habit is full of good blood, the phlegmatic, when the habit is full of ſerum or phlegm, the temperate, when the red blood and ſerum are in due proportions, and the depraved or bad habit, which is called cachochymic.

Temporal—A name applied to certain bones, arteries, muſcles, &c. about the temples.

Tendon—Is a continuation of muſcular fibres, it being divided into as many fibres, or rather bundles of fibres, as the muſcle itſelf to which the tendon belongs; but the tendinous fibres are more compacted, ſmaller, drier, and harder than the fleſhy fibres. Tendons are not capable of contraction, but ſerve like ropes to pull when the fleſhy fibres of the muſcle acts, and for the com-

modiouſneſs

modioufnefs and firmnefs of infertion, and for the direction of motion.

Tenefmus—A continual painful urging to ftool, when little or nothing can be dif-charged, with confiderable pain at the anus on every attempt.

Teres—The round worm, which infefts the inteftines both of men and quadru-peds.

Terra—Earth, of which various kinds are ufed as medicinal.

Tertian—A fpecies of fever of the inter-mittent kind; every firft and third day it is prefent, the fecond day is free.

Teftes—The tefticles.

Tela cellulofa—The cellular membrane.

Tetanus—Is a fpafmodic diforder, in which the

the whole mufcles of the body are rigid, ftiff, and immoveable.

Therapeutic—Is that part of medicine which particularly refpects the cure of difeafes.

Theory—Is the deductions of general principles from particular facts, and the application of thefe general principles again to particular cafes. Theory is condemned by the illiterate and ignorant as mere conjecture, becaufe they are unacquainted with it themfelves; but medical theory is grounded on reafon, and well worth that ftudy and attention it deferves.

Thorax—Is that part of the body which is called the breaft, or cheft. It contains the lungs, heart, &c.

Thymus—The name of a gland in the breaft. It is large in young animals, but

 fhrivelled

ſhrivelled in adults. It is alſo called the ſweat bread.

Tonic—Medicines which ſtrengthen the fibres. Every veſſel, membrane, and muſcle, with every the ſmalleſt fibre in ſenſible parts, have a natural tendency to ſhorten or contract themſelves. This is called their tonic power. Medicines which are given with the view of reſtoring this power when deficient are called tonics.

Tonſils—The name of certain glands at the root of the tongue.

Topics—External applications to any particular part.

Torpor—A ſtate of inaction, ſluggiſhneſs, or an averſion to move about. It is likewiſe applied in caſes of numbneſs, or deficient feeling.

Trans-

Transfusion—The tranfmiffion of blood from the veffels of one animal to thofe of another, by means of a canula or pipe.

Tranfpiration—To breath through; perfpiration.

Tranfudation—To fweat through, or perfpire through the pores.

Trifmus—The locked jaw.

Tremor—A trembling, without a fenfation of cold.

Trocar—The name of an inftrument ufed in difcharging the water from the belly in an afcites or dropfy.

Tubæ—Tubes or paffages in any part of the body, as the Euftachian tube in the ear, the Falopian tube, &c.

Tumor—Is a difeafe in which the parts rife

rife above the neighbouring parts, by fwelling, or an undue increafe of its bulk, containing matter. Tumors have different names, according to their fituation, figure, contents, &c. Thus, when pus or matter is the contents of a tumor, it is called an abfcefs; if an abfcefs is formed in the lungs, it is called vomica; when matter is contained in a bag, it is then called an encyfted tumor.

Tunica—A fkin, a coat, or a membrane, which covers any part.

Tubercles—Are little hard tumors which grow upon the furface of any part of the body, or in the internal parts, as the lungs.

Turpentines—The produce of the different fpecies of pine trees, of which there are different kinds, as the Chio, Venice, and Strafburg.

Tuffis

Tuſſis—Cough, which is a violent expulſion of air from the lungs by means of a convulſive force in them, accompanied with a violent expiration.

Tympany—A ſpecies of the dropſy.

Typhus—A fever of the nervous kind.

U.

U.

Ulcer—Is a ſolution of continuity in a ſoft part, made by eroſion of the fleſhy ſubſtance. Wounds degenerate into ulcers in bad habits from a fault in the humours; hence there is a farther loſs of ſubſtance. A loſs of ſubſtance in the bones from eroſion is called a caries, and, when an abſceſs is opened for the diſcharge of its contents, it gets the name of ulcer. Ulcers receive different names, from the cauſes, figure, and the parts they affect.

Unguent—The name given to ointments.

Ungues—The nails on the fingers and toes in the human body, and the hoofs and claws

claws in animals. They are continuations of the epidermis or ſcarf-ſkin. Their ſubſtance is like that of horn. They are compoſed of ſeveral planes of longitudinal fibres ſtrongly compacted together. Theſe ſtrata end at the extremity of each finger, claw, or hoof. They are all nearly of an equal thickneſs, but of different lengths. The principal uſe of the nails and claws are to ſtrengthen the fingers in the human body and the feet in animals, and to catch their prey. Hoofs are the baſe and ſupport of the whole body in horſes. The term ungula is applied to horny ſubſtances.

Unorganized—Not organized or not formed.

Urachus—Is the paſſage for the urine from the fœtus to the allantois.

Urethra—The paſſage of the urine from the

the bladder till it is conveyed out of the body, in male and female.

Urine—That fluid which is ſecreted from the blood in the kidneys, conveyed by the ureters to the bladder, and thence diſcharged out of the body.

Ureters—Tubes or canals which convey the urine from the kidneys to the bladder.

Uterus—The womb; called alſo the matrix. It is ſituated in the pelvis, between the rectum and bladder.

Uvea—A name given to the poſterior lamina of the iris; by ſome the choroides is called the uvea.

Uvula—That fleſhy ſubſtance which covers the wind-pipe, acting as a valve. By means of its different actions we can breath either through the mouth or noſe. It is of an irregular ſhape.

V.

Vaccine—Belonging to a cow, or taken from a cow.

Vagina—The paſſage from the external pudenda to the mouth of the uterus.

Valve—Is a membraneous ſubſtance on the inſide of certain veſſels, as in the veins, &c. which open to admit the blood or other fluids to paſs, and which ſhut immediately to prevent their returning.

Valvulæ conniventes—They are looſe circular folds on the inſide of the inteſtines. Their uſe is to mix the chyle with the bile and pancreatic juice, and to retain the chyle that it may not efcape the lacteals.

Valetudinarian, or *valetudinary*—One that is weakly; infirm.

Vapor—The fine parts of warm fluids that fly off in a fteam or thin fmoke in an aëriform ftate.

Variola, *variolus*—Infectious matter, as the fmallpox in the human fubject, or the variolus matter from farcy ulcers in horfes.

Varix or *varices*—A preternatural and irregular dilatation of parts of the veins.

Vafcular—Full of veffels; confifting of veffels; or any thing belonging to the vafcular fyftem.

Vegetables—Are thofe productions of nature which have life and growth, but no fenfe, as herbs, trees, &c.

Ve-

Veterinarian—One who profeſſes the art of curing the diſeaſes of horſes and other cattle. The term veterinary is uſed for the ſake of brevity.

Vena, a *vein*—Thin tubes or canals which ariſe in the extremities of the body and terminate in the heart. The blood is diſtributed all over the body by the arteries, and is returned to the heart by the veins.

Venenum—Venom or poiſon.

Venter—The belly or abdomen.

Ventricle—The ſtomach; alſo the ventricles or cavities in the heart and brain.

Vermes—Worms which infeſt the inteſtines both of men and animals, as the teres or round-worm, the tape-worm, the aſcarides, and bott-worm. The latter is peculiar to horſes.

Verrucæ—Warts; excreſcences on the

ſurface

furface of the body. They are either wet or dry.

Vertigo—A giddinefs in the head, when objects feem to the patient to turn round.

Vefica urinaria—The bladder which contains the urine.

Vefcula, fellis—The gall-bladder; likewife called *folliculus fellis.* In the human body, it is fituated under the great lobe of the liver, a little towards the right fide, but horfes and feveral other quadrupeds have no gall-bladder.

Vertebræ—The bones of the neck, back, and loins.

Veffel—Any thing that contains fluids in the body.

Villous—Shaggy foft woolly hair-like fubftances.

ſtances. This term is applied to the internal coats of the ſtomach, inteſtines, &c.

Viſcera—The bowels, or contents of cavities within the body, as the brain within the ſkull; the heart and lungs in the thorax or breaſt; the ſtomach and inteſtines in the abdomen or belly; the bladder, and parts of generation, in the pelvis. When any of theſe are mentioned ſingly, they are called viſcus.

Viſcid—Tenaceous, glutinous.

Viſcidity—Ropineſs, clamineſs, glutinouſneſs.

Vis conſervatrix—The preſerving power, or the exertion of the plaſtic power, as far as maintains organization.

Vis genetrix—The generative power, or the generative exertion of the plaſtic power.

Vis

Vis medicatrix—The healing power, or the plaſtic powers employed in extinguiſhing diſeaſe and reſtoring health. This is often expreſſed by the words nature, and natural cauſes.

Vis vitæ, called alſo *vis medicatrix naturæ*—The ſtate or condition of animal organization, indiſpenſibly requiſite to the capability of function.

Vital heat—Neceſſary or eſſential to life.

Vitriol—Preparations made from pyrite ſtones, in which there are copper, and from which a great variety of preparations are made both for medical and ſurgical uſes.

Vitreus—Glaſſy; applied to the pellucid humour of the eye.

Viviparous—Animals which bring forth their young alive.

Volatile—This term is applied to ſubſtances of ſo light a nature, that their particles are perpetually eſcaping into an aëriform ſtate.

Vomer, called alſo *ſeptum naſi*—The partition in the noſe.

Vomica—A tubercle or abſceſs in the lungs.

Vulneraries—A name given to a certain claſs of medicines of the balſamic kind.

Vulnus—A wound, or a recent bloody ſolution of continuity in the fleſhy parts, made by a hard or a ſharp inſtrument.

W.

Warble—A ſmall hard knot or tumor ſitu-ated below the ſkin of horſes.

Warts—See verrucæ.

Water—See aqua.

Wen—A fleſhy or callous excreſcence.

Windgal—Little ſoft ſwellings on the joints and legs of horſes.

Withers—The top of a horſe's ſhoulder, immediately before the ſeat of the ſaddle.

Womb—That viſcus which contains the fœtus.

Worms—See vermes.

Wound—See vulnus.

Y.

Yaws—A diſeaſe endemical to Guinea and the hot climates in Africa.

Yeſt, *yeaſt*, or *barm*—The ſcum that ariſes on fermented liquors, as wort made from malt. Recommended in putrid fevers by the Reverend Mr Cartwright.

Yellows—In horſes, the jaundice.

Z.

Zedoary—A ſpicy plant, the root of which is uſed in medicine. It comes from the Eaſt Indies.

Zigomatic—The name of a proceſs of a bone and of a muſcle, forming an angle like a yoke.

Zingiber, ginger—A root of a fibrous texture. It is warm and aromatic, of great uſe in cold flatulent diſorders, and where there is a laxity or debility of the inteſtines. Its effects are more durable than thoſe of the pepper kind.

Zoology—A treatiſe on animals.

Zoonomia—A diſcourſe reaſoning on the principles of animal life.

Zootomy—The diſſection of animals.

TERMS IN FARRIERY—*Omitted.*

A.

Ambury, *anbury*, or *angle berry*—Red, moiſt, fleſhy excreſcences, of various ſizes, ſomething like a potatoe, tinged with the appearance of blood, which grow on diffe-rent parts of the body in horſes, either with a broad or narrow baſe.

Anticor—A deep ſeated ſwelling in the muſcles of the breaſt, extending upwards to the throat, and threatening ſuffocation.

B.

B.

Balls—Medicines made up in a ſolid form for horſes, and given in the ſhape of a ball.

Bars—Are thoſe ridges on the palate or roof of a horſe's mouth, extending acroſs it, betwixt the tuſks and grinders.

C.

Charge—An external application, compoſed of different ingredients, forming a compound between an ointment and a plaſter, or between a plaſter and a poultice. They are applied either hot or cold, according to the intention of the cure.

Coffin bone—The bone at the extremity of each foot, incloſed within the hoofs of horſes.

Coffin

Coffin joint—The articulation or joining of the paſtern bone with the coffin bone.

Crib-biter—A vice or bad habit in ſome horſes, who, catching hold of their manger, poſt, or gate, with their teeth, ſuck in the air, and ſwallow it in gulps.

Cutting or *interfering*—Is when one foot ſtrikes the oppoſite leg in moving, ſo as to fret off the hair or cut the ſkin.

D.

Drench—Is the giving medicines to horſes in a liquid form.

F.

Falſe quarter—A defect in the quarters of the hoofs of horſes.

Foundring—In the way it is applied to horſes, is a very dark and abſtruſe term, being

being uſed by French authors, it has been adopted by the Engliſh. The word *fondre*, in French, ſignifies to melt or liquify; hence the ancient farriers applied it to that diſeaſe they call molten greaſe; likewiſe to a diſorder in the feet called founder.

Frog, or *fruſh*—That ſoft ſpungy like horny ſubſtance, ſhaped like a dart, connected with the ſole and binders in the under part of the hoofs of horſes, forming their heel.

G.

Gourdineſs—A thickneſs or ſwelling in the legs of horſes.

Greaſe—A diſeaſe in the legs and heels of horſes, attended with ſwelling and inflammation of the parts, followed by a diſcharge from the pores of a clammy, greaſy, ſoapy like matter, of a very fœtid ichorous quality.

H.

H.

Haws—A preternatural enlargement of the cartilagenous ſubſtance in the inner canthus of the eye of horſes.

Hide-bound—A term in farriery, when the ſkin of a horſe is hard and dry, and adheres too cloſe to the back and ribs, &c.

Hoof-bound—A horſe is ſaid to be hoof-bound, when, from diſeaſe or bad management, in keeping them too dry, or in ſhoeing, the hoofs contract and grow leſs than they originally were.

J.

Jardon—Is a hard callous ſubſtance which grows on the outſide of a horſe's hock.

K.

Kibes—Are chinks or cracks on the inſide of the hind paſterns or heels of horſes.

L.

L.

Lampas or *lampars*—A ſwelling of the palate, which riſes above the fore-teeth, moſtly in young horſes, and prevents their eating.

M.

Mallenders—Is a diſorder in horſes on the inſide of the fore leg at the bending of the knee, and is a diſcharge of a ſharp indigeſted matter, ſimilar to that diſorder called the ſallenders on the bending of the hock joint.

Mange—See ſcabies.

Molten greaſe—A diſorder in horſes, in which, it is ſaid, the fat is melted, occaſioning a violent diarrhœa, attended with a diſcharge of an oily ſubſtance with the dung.

N.

N.

Near-ſide—The ſides of a horſe are diſtinguiſhed by the term near, far or off-ſide. The near-ſide is the left ſide, to which we always approach when we go to mount or to handle a horſe.

Nicking—An operation performed on the tails of horſes, which is, dividing the flexor muſcles on the under ſide of the tail croſs-ways, and elevating the tail by means of a pully for ſome time afterwards.

O.

Oſslets—Bony excreſcences which grow on the bones of the knee joint.

P.

Panicle—A muſcular expanſion peculiar to horſes and other large quadrupeds, called the fleſhy panicle, ſituated immediately under the cutis or true ſkin, particularly in the ſhoulders, ribs, and flanks, where, at the pleaſure of the animal, it draws the ſkin into wrinkles, and, by a quivering motion, ſhakes off duſt or flies that hangs looſe on the hair.

Paſtern of a horſe—Is the ſpace between the fetlock and the coronet, conſiſting of two bones, called the great and little paſterns.

Poll-evil—In horſes, is a deep ſeated tumor on the nape of the neck or poll, juſt behind the ears, which ſoon becomes an abſceſs.

Purſiveneſs—In horſes, a difficulty of breathing, or aſthmatic.

Q.

Quittor—A tumor on the coronet of a horſe's foot, which ſoon terminates in a fiſtulous ulcer.

R.

Rats-tails—Is a dry warty excreſcence on the legs of horſes, reſembling the tail of a rat, in a perpendicular direction above the fetlock joint.

Retraits—A term for the prick of a nail in ſhoeing horſes.

Ridgel, *ridgling*, or *riggling*—A horſe that has been but half-cut or half-caſtrated.

Rowels—A term in farriery for an iſſue or artificial vent in horſes.

S.

S.

Sand-crack—A term for a ſmall cleft or crack in the hoofs of horſes.

Stavers, or *ſtaggers*—A general name, very improperly applied by farriers to all diſeaſes in horſes when they reel, ſtagger, or appear giddy, on being moved, and which they have divided into three ſpecies, viz. the ſtaggers, as above; the mad ſtaggers, which properly is frenzy or delirium; the ſleepy ſtaggers, which is a lethargy.

V.

Vives—See Strangles.

W.

Wolves teeth—A horſe is ſaid to have wolves teeth when the teeth grow outwards or inwards, ſo as to lacerate and wound the cheeks, gums, or tongue, on eating, or when the upper teeth overpaſs the under, ſo as to prevent his chewing his food.

VETERINARY PHYSIOLOGY

AND

PATHOLOGY.

INTRODUCTION.

Chap. I.

IN the foregoing definitions we have explained what is meant by Phyſiology, viz. That branch of medical ſcience which teaches us the knowledge of the animal œconomy in general; the uſes of the different

rent organs of the body; how far they are ſubſervient to one another, and how far each contributes to perfect life and health, by a ſteady performance of their ſeveral functions, and a regular co-operation with thoſe various organs which conſtitute the animal body: for, till ſuch time as this branch of medical knowledge is in ſome degree underſtood, we cannot comprehend that other branch which immediately follows it, viz. Pathology, which is that part of medicine which explains the nature of diſeaſes, their cauſes and ſymptoms; for, in order to underſtand a diſeaſe, we ſhould conſider the morbific cauſes, parts affected, ſymptoms, criſis, diagnoſis, and prognoſis. Phyſiologiſts have adopted different modes or methods in beginning to explain the animal œconomy: Some begin by deſcribing the external teguments; others with the circulation of the blood; others again begin by deſcribing the

minute

minute conftituent parts of the body:—We fhall adopt this latter method, as it may be attended with more benefit to thofe who have not had the opportunity of attending a regular courfe of anatomy: Obferving at the fame time, that the human, and every other animal body, may be compared to a circle; the actions or functions of its different parts being, throughout the whole body, in a ftate of mutual dependency upon each other; infomuch that, at whatfoever part we begin to explain its operations, we are obliged to affume, or take for granted as known, the action of fome other organ, which influences that we firft treat of. Thus, if we begin with defcribing the circulation of the blood, as the heart is a mufcle, we muft fuppofe mufcular motion in fome degree underftood. If mufcular motion was to be firft explained and accounted for, as that cannot be produced without fome operation

ration of the nerves and arterial blood, we ſhould be under a neceſſity of ſuppoſing the influence of the nerves as known, and at leaſt a part of the circulation. Again, if we commence by explaining the nature of the aliments before they are ingeſted; proſecute the ſucceſſive different changes they undergo, from the mouth, to their being mixed with, and converted into blood; then deſcribe the circulation, and ſo on; in the courſe of that method muſcular motion frequently occurs, before it can be treated of in its due order; many glands offer themſelves before ſecretion can be explained, &c. In ſhort, whatever method is uſed, the like inconvenience occurs. In order to avoid this intricacy, and that the beginner may be as little embarraſſed as poſſible, we ſhall begin, as was propoſed, by deſcribing the conſtituent parts of the body, and gradually proceed to the larger and more compounded.

Fibre—In anatomy and phyſiology, denotes a ſmall thread or filament, without a cavity, at leaſt without a viſible cavity; whoſe breadth and thickneſs bears a very ſmall proportion to its length. The leaſt fibre of all is too minute to be perceived by our ſenſes, however aſſiſted. Theſe fibres are no other than bundles of many ſmaller ones tied together. Their more permanent parts are demonſtrated to be compoſed of earth whoſe particles poſſeſs connection and a power of coheſion, not from themſelves, or from mere contact, but from the intermediate glue or gluten placed betwixt them. It has likewiſe been demonſtrated, from the chemical analyſis of animal ſubſtances, that this glue or gluten is compoſed of oil combined with water, by the vital attrition in

the

the body of animals. Thefe fibres, compofed, as we have feen, of earthy particles, adhering longitudinally, and connected by an intervening cohefive glue, compofe one of the leaft or moft fimple fibres, fuch as may be underftood rather from reafon than from our fenfes, even when affifted by the moft accurate microfcopes, by which the fmalleft fibre, when divided to ftill fmaller, appear in every refpect fimilar to the larger, till at laft they feem mere lines.

The fibres which appear to the unaffifted fight may be faid to be of two kinds: the firft is lineal, and have their length confiderably large in proportion to their breadth; the fecond are thofe in which their breadth is greater than their length. Thefe, when loofely interwoven with each other, form what is called the cellular tunic, or cellular membrane.

This

This cellular ſubſtance is made up of an infinite number of fibres, forming little plates or ſcales, which, by their various directions, form ſmall cells or web-like ſpaces, and join together all the parts of an animal body in ſuch a manner as not only to ſuſtain, but to allow them a free motion at the ſame time. But in this web-like ſubſtance there is the greateſt diverſity relatively to the proportion betwixt the ſolid parts and open cells, as well as the breadth and ſtrength of the little plates, and the nature of the liquor they contain, which is ſometimes more watery and ſometimes more oily; and likewiſe to the mixture of fibres or ſolid parts in one place more than others. But of this important membrane in the animal œconomy we ſhall have occaſion to ſay more hereafter.

Membranes—Out of the above net-like cellular ſubſtance, compacted by the little plates concreted and preſſed together, ariſe broad and

and flat plates, lamina, or ſkins, in various parts of the body; which, being generally diſpoſed in a rectilineal direction, form what are called membranes, whoſe thickneſs bears a very ſmall proportion to their breadth and length. Moſt, if not all the membranes we ſee in the animal body, are compoſed of, and reſolvable into thinner ones.

Veſſels—Membranes being convoluted into cones and cylinders, pervaded by a flux of ſome juices or liquors through their cavities, put on the name of veſſels, which, in a general ſenſe, ſignifies whatever has a cavity to contain and hold any thing, is here commonly reſtricted to ſignify the animal tubes or canals through which fluids or juices move. The leaſt imaginable veſſel is made of the leaſt membrane, rolled up in the form of an hollow cylinder, or part of a cone. The larger veſſels, as their coats or walls

muſt

muſt be thicker, are compoſed of thicker membranes, upon which ſmaller veſſels run.

Artery—Is the name of that kind of veſſel, which, ariſing originally from the heart, contains a fluid, whoſe motion is directed from the heart towards the extremities and ſurface of the body. The larger, and eaſily viſible arteries, contain red blood ; are of a conical figure, ſlowly tapering from the heart towards the ſurface and extremities of the body. In living animals they beat, or have what is called a pulſe, anſwering to the motion of the heart. Their coats or walls look whitiſh, and are pretty thick and ſtrong.

Veins—On the other hand, contain a fluid, whoſe motion is from the extremities or ſurface of the body towards the heart. Their coats are thinner and more tranſparent than

thoſe

thofe of the arteries, and therefore they appear of a bluifh livid colour, the blood fhining through them. In many places they have valves within them, which open towards the heart, and fhut the contrary way.

Gland—Denotes in general an organical texture, of a circumfcribed figure, framed fo as to feparate from the blood a liquid different from and unlike the blood. Of thefe there are various kinds, fome more fimple, others more complex or compounded, as fhall be fhewn in the fequel.

A *duct*, or *excretory duct*—Is a canal containing a fluid different from red blood; and is almoft always the outlet of a gland or glands, or fome glandular contrivance.

Nerve—Is the appellation of thefe foft white cords, which proceed either from the

brain

brain and its appendages, within the cranium or ſkull, or from the ſpinal marrow, and are the immediate inſtruments of ſenſation, and indiſpenſably requiſite towards producing muſcular motion. They are without any cavity diſcernible even by the fineſt microſcope.

Muſcle—Is the name of the immediate organical inſtrument of motion in the animal body, whether voluntary or involuntary. They may be ſaid to be organical, becauſe mere elaſticity is the immediate cauſe of ſome motions, as in exſpiration, and the reſtitution of the arteries. The general characteriſtic of a muſcle is, to conſiſt of fleſhy fibres, which, when acting, contract themſelves, and become ſhorter. This contraction, according to the different circumſtances of the muſcle, and the parts to which it is faſtened, produces different effects and different

different motions. Thus, if one end of a muſcle is tied to a fixed part, and the other to a moveable one, when it acts, its fibres contracting, will pull the moveable part towards that which is fixed. If both the parts, to which the extremities of a muſcle is attached, be moveable, by its action they will be both drawn towards each other, If the muſcle be hollow, and contain a fluid, when it contracts, it will preſs upon and endeavour to expel its contents. Such a muſcle is the heart, and, in ſome meaſure, the ſtomach and urinary bladder. If the fibres of a muſcle return upon themſelves in the form of a ring, when they contract, they will diminiſh the area within that circumference. Such muſcles are employed to ſhut cavities, and are called ſphincters, as in the anus.

A *tendon*—Is a continuation of muſcular fleſhy fibres, it being diviſible into as many fibres, or rather bundles of fibres, as the mufcle itfelf is, to which the tendon belongs; but the tendinous fibres are more compacted and fmaller, drier and harder, than the flefhy fibres. They are not capable of contraction, but ferve like ropes to pull when the flefhy fibres act, for the commodioufnefs and firmnefs of infertion, and for the direction of motion.

Ligaments—Are white, tough, flexible bodies, thicker and firmer than membranes, and not fo hard or folid as cartilages without cavity, difficultly ftretched, and with little elafticity. They ferve to connect parts together, and to keep the parts to which they are fixed in a proper fituation, as appears remarkably in the articulations or joints. They are made up of fibrous layers or ftrata; the largeft and ftrongeft of which run lengthwife.

Cartilages

Cartilages or *griftles*—Are folid, fmooth, white, elaftic fubftances, between the hardnefs of a bone and that of a ligament, covered with a membrane called *perichondrium*, fomething fimilar to the periofteum of the bones. They ferve to make the bones, whofe extremities they cover, move freely in articulations. They limit the growth of bones as to their length, by hindering the bony fibres from fprouting out, and, therefore, when the cartilages in an articulation are eroded, an anchylofis or immobility of the joint is formed, by the elongation and coalition of the fibres of the bones that are articulated together. Sometimes they ferve as ligaments to join bones together; and fometimes they do the office of bones to greater advantage than thefe would do; as the cartilages of the ribs in the human body, which, by their elafticity, chiefly contribute

towards

towards expiration; the cartilages that make out the brims of cavities, &c.

Bones—Are the hardeſt and moſt ſolid parts of the body, ſerving to ſupport the ſofter and leſs firm ones in all their motions and preſſures. They are covered with a membrane called *perioſteum*, which is exquiſitely ſenſible, being plentifully ſupplied with nerves and blood-veſſels. The outſides of bones are commonly more compact and ſmooth than their inner parts, and are formed of plates, joined together by tranſverſe fibres. Their inſides are ſpungy and cellular, in which is contained marrow within membranous bags, filling up the cells. This marrow, being more or leſs diſtributed all over the bones, and tranſuding through their plates and fibres, makes them tougher and leſs brittle. The bones are ſupplied both within and without with blood-veſſels and nerves.

Gluten

Gluten—This ſubſtance, which conſtitutes a great part of an animal body, and which cannot be called either fibrous or cellular, is, as has been formerly obſerved, a mere glue, evaſated and concreted not within the fibres, but in the ſpaces betwixt them by which they are connected, and which gives them a degree of firmneſs, and conſtitutes the more ſimple parts of the animal fabric. That the bones are formed of this compacted gluten is ſhown from diſeaſes, in which the hardeſt bones, by a liquifaction of their gluten, return into cartilages, fleſh, or jelly. For, all the parts of an animal body, from the ſofteſt to the hardeſt, ſeem to differ only in this, that the hardeſt parts have a greater proportion of earthy particles, more cloſely compacted, with leſs aqueous glue; and, in the ſofteſt parts, there is leſs earth and more glue.

Having

Having thus given a ſhort deſcription of what are called the ſolids in an animal body, the fluids, with their different ſecretions, will be taken notice of in their proper place. But, before we enter upon the particular actions or functions of the living body, it will be highly proper to take into conſideration more at large, the uſe, ſtructure, and importance of the cellular membrane and its fat.

CHAP. II.

Of the CELLULAR MEMBRANE, *or* TELA CELLULOSA, *and* ADIPOSE MEMBRANE.

THIS cellular fabric is firſt met with on diſſecting bodies, immediately under the ſkin, and forms the connection betwixt it and the external muſcles. In flaying animals, it requires to be cut by the knife, or forcibly tore, where the connection is more looſe, which is well known to butchers and others employed in that office. When ſlaughtered animals are properly blooded, previous to the taking off the ſkin, it appears of a whitiſh colour, and of a woolly like ſubſtance *, reſembling the pile on velvet,

* *Query*—Might not theſe woolly like fibres which form the connecting medium between the ſkin and the body be conſidered

vet, adhering moſt intimately to the ſkin in every point all over the body, even to the very extremities.

This univerſal membranous ſubſtance is not only continued without interruption all over the under ſurface of the body, but it inſinuates itſelf into every receſs. Even the membranous bags which contain the marrow, within the cavities of the bones, are compoſed of it; and that by far the greateſt part of what are called the ſolids in the body, are made up of, if not entirely framed out of it originally, as will appear more fully hereafter.

The great importance of this cellular ſubſtance in the animal fabric will appear from its utility in the animal oeconomy in general, as from it alone proceeds the firmneſs

conſidered as hollow tubes which conſtitute the cuticular pores, the mouths of the exhalent veſſels, ſebaceous ducts? &c.

nefs and ftability of all the arteries, nerves, and mufcular fibres of the body, and, confequently, of all the flefhy parts, and vifcera formed from it. Even the figures of the parts, their proper length, curvatures, cavities, and motions, depend entirely on this cellular texture, which, in fome places, is of a lax, in others, of a harder fabric. Of this fubftance, together with the veffels, nerves, mufcular, and tendinous fibres, all the vifcera, mufcles, and glands, with their ligaments and capfules, are compofed. Its various length, tenfion, quantity, and proportion, occafions the difference in the glands and vifcera.

This cellular fubftance is made up of fibres and plates, which are faid to be neither hollow nor vafcular, but folid, although it is painted by an acceffion of veffels, which are only adventitious, but no part of its true ſtructure. The differences obſerved in its fabric are, that in ſome parts of the body it is open and looſe, formed of long and diſtant plates. In others, it is thin and compact, being made up of ſhort concreted fibres; where it is extended over the larger veſſels, and forms what are called capſule, vagina, or coats, it is compoſed of longer fibres, as in the different viſcera, particularly the liver and lungs, &c.

The cellular texture is more lax, and formed of plates rather than fibres, where it divides the muſcles and their fibres, even to the moſt minute fibre of which they are compoſed. It ſurrounds and ſuſtains the moſt minute veſſels in their free motions, and, as we have ſeen, enters into the cavities of the bones. It is very lax under the ſurface of the body, being everywhere interpoſed betwixt the muſcles and the ſkin.

The

The ſpaces or intervals betwixt the plates of the cellular membrane are everywhere open, and forms one continuous cavity throughout the whole body. This appears from a great variety of circumſtances, as the blowing air into it with a pipe, a practice farriers have when they put rowels or iſſues in horſes, and, by preſſure of the hand on the ſkin, conduct the confined air through the cellular ſubſtance to a conſiderable diſtance from where it was introduced; likewiſe from air introduced by a wound in the lungs, which cauſes a ſwelling throughout the whole ſurface of the body, and which is called emphyſema; from the paſſage of bodies put under the ſkin, to remote parts from that at which they entered; the tranſlation of pus or matter from where it originated to different parts of the body; from diſeaſes, particularly in thoſe where a watery or ſerous humour is depoſited into all the cells

of

of this net-like ſubſtance throughout the body, and is emptied from them by one ſingle inciſion made through the ſkin. We know likewiſe, that water collected in the cellular ſubſtance is frequently abſorbed by the veins and thrown out by the inteſtinal tube, occaſioning a diarrhoea.

This cellular fabric appears to poſſeſs a contractile power, which diſpoſes its fibres to ſhorten or contract themſelves gradually after they have been diſtended or lengthened. This power, when excited by cold, renders the ſkin rigid, raiſes the hairs, draws up the ſcrotum, and, after geſtation, reſtores the ſkin of the abdomen and of the uterus to their former ſize.

This cellular ſubſtance is moiſtened by a watery vapour, ſomewhat gelatinous and oily, exhaled out of the arteries, and again taken up by the veins. When this vapour

is

is deficient, the ſmall fibres grow together, the contiguous membranes or plates are cemented into one ſubſtance, with the loſs of their motion.

We have hitherto conſidered the cellular membrane in its reticular or web-like fabric, where its cells communicate with each other all over the body. We are now to conſider it as forming what is called the adipoſe membrane, which contains fat or animal oil, (beſides the watery vapour and gelatinous fluid formerly mentioned). Some anatomiſts conſider this membrane diſtinct from the cellular, as it does not form a complete covering, but is in many parts wanting, and its cells not ſo numerous nor ſo extenſive over the body, being limited to certain parts, and the fat in the cells of the adipoſe membrane varying in degree of firmneſs in different parts of different animals, eſpecially in the abdomen. In the ox and ſheep it is ſuet

or

or tallow; in the hog it is lard; and in the horfe, bear, dog, and fome other animals, it is greafe. This adeps or fat, in live animals, is nearly in a fluid ftate; in thofe that are flaughtered and expofed to a cold air, it concretes into a folid fubftance, efpecially about the kidneys. Towards the furface of the body, and in the bones, it partakes more of the oily quality.

Whether the cellular membrane and the adipofe are really diftinct and feparate membranes will not, we apprehend, affect the general practice in curing the difeafes of animals; the only difference feems to be, that the cells in the former communicate all over the body; in the latter they do not.

Dr HUNTER is of opinion that the cellular membrane is compofed of two kinds of cells, viz. the reticular, which communicate

nicate with each other, and the adipofe, which are diftinct from one another, and do not communicate, but are refervoirs of the animal oil or fat. We fhall reft upon his authority, and proceed to defcribe its formation and ufe.

Through the cellular fubftance the blood-veffels run in every direction. From the fmaller arterial extremities the fat is depofited not by any ducts or glands, but it tranfudes on all fides through the arteries, and is depofited under the fkin and in its hollows. That this liquid fat or oil is abforbed by the veins, we know from the fudden effects which long continued exercife of the mufcles has in wafting or confuming the oil of very fat animals, alfo from the confumption of the fat in difeafes.

The

The ufes of the fat are various. It facilitates the motions of the mufcles in all parts by leffening their attrition againft each other, and to prevent ftiffnefs or rigidity. It fills up the intermediate fpaces betwixt the mufcles with the cavities about many of the vifcera, in fuch a manner, that it readily yields to their motions, and yet fupports them when at reft. It principally conftitutes the weight of the body. It conducts and defends the veffels, and gives an uniform extenfion to the fkin, and ferves as a cufhion to eafe the weight of the body, and renders the whole of a comely agreeable fhape. It has a principal fhare in forming the bile; and, by mixing with many of the humours, it abates their acrimony; and, by tranfuding through the cartilaginous ends of the bones, it mixes with the liquids in the joints, and, by reabforption, it lubricates their fibres; by exhaling through the pores of the

the ſkin, it reſiſts the inclement or drying quality of the air; and, by exhaling from the internal viſcera, it lubricates their ſurfaces with an oily emollient vapour, as we find on opening bodies while they are warm; and, by interpoſing itſelf between their integuments, it prevents their concretion.

The fat is depoſited into the cellular cells by ſleep, reſt of body, and a diminiſhed force of circulation of the blood; but, on being collected in too great a quantity, it proves injurious, by compreſſing the veins and retarding the circulation, by cauſing too great a reſiſtance to the heart. Hence it occaſions ſhortneſs of breath, and renders the body liable to apoplexy or dropſy.

The fat being in a liquid ſtate, ſomething like oil, it is taken up by the veins, and, being rapidly moved along the arteries, is conſumed by violent exerciſe, by fever, faſting, preternatural diſcharges from the body, as diarrhœa, diabetes, or by ſuppuration of matter. When too much of it is retained in the blood, it increaſes acute diſeaſes, tinges the urine, and forms a part of its ſediment. After a ſudden conſumption of it, where the juices are good and the humours healthy, it is very ſoon renewed; but in a languid habit, inſtead of fat, a jelly or gelatinous fluid is depoſited in the cells. Hence ariſes that ſpecies of dropſy called anaſarca, and other dropſical ſwellings in different parts of the body.

Recapitulation.—If we conceive a honey-comb, in which every cell opens into all thoſe that are contiguous to it, we ſhall form ſome idea of the cellular ſubſtance. Its cells are in ſome places ſmaller, in others larger; it is dilatable by a very ſmall force, where it is not confin-

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ed by refiftance in its neighbourhood. Where its cells are largeft, and its texture loofeft, it contains fat, as immediately under the fkin, almoft over all the furface of the body, between it and the moft external mufcles; in the intervals or interftices between one mufcle and another; in the omentum, mefentery, around the kidneys, &c. Where the cells are fo fmall as not to receive mere oil or fat, as in very young animals, and in many places of the adult body, they contain a gelatinous fluid; or, if ftill fmaller, a vapour of the like nature; and, if all thefe are wanting, they grow together.

That thefe cells communicate together all over the body appears, as already obferved, from the effects of blowing into it. Butchers, by blowing into a fmall wound, penetrating quite through the fkin, not only raife the

fkin,

ſkin, but fill the interſtices between the fleſh and muſcles, to make their meat look full and plump. In the living body, by a wound, air oft gets into the cellular texture, and produces what is called in ſurgery an *emphyſema*, or a windy tumor, which is ſometimes propagated ſo widely as to cover almoſt the whole ſurface of the body; and has been found to have penetrated even into the vitreous humour of the eye. In an anaſarca, which is that ſpecies of dropſy in which water is contained in the cells of this web, inſtead of fat or gelatinous ſubſtance, &c. there hath been water found got into the cavernous body of the penis, demonſtrating the extenſive communication of the tela celluloſa.

This membranous web or texture, by laborious diſſection, by blowing air into it, by injections, by maceration, hath been found

found to follow every viſible bundle of muſcular and tendinous fibres, every veſſel, every nerve, every coat or membrane of the viſcera, the brain not excepted. We find it conſtituting a great part of the ſolid ſubſtance of the moſt important parts, as the oeſophagus, ſtomach, inteſtines, urinary bladder, &c. It even follows the perioſteum of the bones, and with it penetrates into the medullary cavities. So that there is no phyſical point in the whole animal ſtructure in which there is not a portion of the tela celluloſa cohering and communicating with its main body.

It ſerves as a bond of union, by tying and faſtening all the parts together, yet in ſuch a manner as not to prevent or obſtruct their neceſſary motions; to contain fat where fat is required, or marrow, or a thin gelly or gelatinous vapour; to render

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the parts ſmooth, moiſt, and flexible, and to hinder them from growing together. It yields a commodious paſſage for veſſels and nerves to glide along. It furniſhes a conſiderable part of the membranes, that either line the great cavities of the body, as the pleura and peritoneum, or immediately cover and envelope the particular viſcera; of the membranes, of the muſcles and tendons, veins and arteries, nerves, glands, and their excretory ducts; inſomuch that it may be truly ſaid, the far greateſt ſolid part of the body is made up of it, if it is not all entirely framed out of it originally.

In this cellular membrane, or tela celluloſa, ſuppuration is formed; ſinuſes and fiſtulas run; encyſted tumors are bred; and, as hath been before hinted, emphyſema and anaſarca are formed; perhaps, likewiſe the ſeat of rheumatiſm.

MAL-

Malpighius firſt laid the foundation of the knowledge of the true ſtructure of the tela celluloſa; anatomiſts before him having either no idea at all of it, or, at beſt, but uncertain, confuſed, and inadequate notions. In his inquiries into the nature of the fat, he diſcovered that it was not laid together in confuſed heaps, but contained in diſtinct membranous veſicles; and, likewiſe, that the veſicular texture was ſpread over all the body, penetrating even into the bones.

After him, Rhuysch found and demonſtrated a cellular texture, where there was no fat, in many places, and therefore termed it *celluloſa*, preferably to *adipoſa*. Lewenhoek's microſcopical diſcoveries agreed with Rhuysch's preparations.

Boerhaave united all the diſcoveries relating to this ſubject that had then been

made,

made, and digefted them into a comprehenfive elegant fummary, in his Preface to the *Leiden* edition of the *Autores varii de Morbo Gallico.*

Since that time, various anatomifts have added ufeful obfervations and improvements. But, of all authors, Profeffor HALLER hath moft diftinguifhed himfelf: he hath repeated the old experiments, added new ones, and delivered the refult of the whole in his *Primæ Lineæ Phyfiologiæ.*

CHAP.

CHAP. III.

Of the HEART, *its* PERICARDIUM, *and* CIRCULATION *of the* BLOOD.

WE have in the former chapter ſhewn that the living body may be fitly compared to a circle, as all the actions or functions of its different parts are in ſuch a ſtate of mutual dependence upon, and connection with one another, that, at whatſoever part we begin to explain the animal economy, we are obliged to ſuppoſe or affume, as already known, fomething which hath not as yet been touched upon.

To prevent the beginner's being embarraffed by this intricacy, we have given fhort and plain definitions, likewife defcriptions of the different claffes or fpecies of the fundamental conftituent folid parts of the body; that, where their names occur, the young reader may have fome idea, not only of the meaning of the terms, but likewife of the general ufes of the parts expreffed by them.

We judged it alfo neceffary to give a pretty comprehenfive account of the cellular membrane, which ties together all the parts, at the fame time preferving their fitnefs for motion; and likewife contributes a large fhare towards their organical ftructure and compofition.

We

We now begin to confider the body as alive, with its fluids and folids moving and being moved, acting and being acted upon mutually by each other.

We fhall firft explain what life is, wherein it precifely confifts.

Life confifts in the action of the heart, and the motion of the blood influenced by that action.

Where the heart is perceived to beat, there we pronounce life to be, though no other function be exercifed; and, where we are certain that the heart is entirely at reft, we cannot with reafon affirm that there is life.

The action then of the heart propelling the blood is corporeal life; and, where there

is

is only this action, and no other, there is the fmalleft degree of life.

But this fmalleft degree of life would quickly be at an end, if there was no other function added to it. The function moft immediately connected with it, and moft neceffary towards its fupport and continuance, is refpiration or breathing. Hence living and breathing are joined together, to fill up the idea and exprefs durable life. If refpiration is ftopped any how in a born animal, that is furnifhed with lungs, life is quickly deftroyed.

But farther, as the heart is a mufcular organ, which by its contraction propels the blood throughout the whole body; and as fome influence or other of nerves is indifpenfably requifite to exercife mufcular motion, as was obferved in the definitions; and as the nerves of the heart

are

are propagated from the brain (by which is meant all that pulpy ſubſtance within the cranium, whether brain, ſtrictly ſo called, cerebellum, or medullary ſubſtance) therefore, as the heart is ſupplied with nerves from the brain, ſome action or influence of the brain and nerves, whatever that be, is neceſſary to maintain the action of the heart.

Hence, therefore, the action of the heart propelling the blood; reſpiration or breathing; and the influence of the brain and nerves, that cauſes and keeps up the action of the heart, muſt concur to conſtitute life of any conſiderable duration, ſuch as we are now conſidering.

Here we may obſerve that, in the living animal body, there is a real perpetual motion during its exiſtence; the heart, the organs of reſpiration, and the brain, act upon one another

another in a circle with an undiminiſhed force, while the ſtructure of the machine, and the condition of its fluids, remain unimpaired.

As therefore life, properly and preciſely ſpeaking, conſiſts in the action of the heart, and the motion of the blood thereby influenced, we ſhall firſt take a general view of its ſituation, its connection with the neighbouring parts, its fabric or ſtructure, ſo far as is neceſſary to comprehend the account we are to give of its action, and then proceed to the other functions that are moſt cloſely connected with it.

And here we would obſerve, that it is not intended to enter minutely into the anatomical deſcription of the parts as we go along, but only ſo far as may be neceſſary to point out the general fabric or ſtructure, the

the ſituation and connection of the parts deſcribed, as deſcriptions of this kind would be difficult to follow out, by which the connection between the function and the ſtructure might be loſt.

The heart is ſituated in the left part of the thorax or cheſt. It is nearly of the ſhape of half a cone, that is, the ſegment of a cone cut through its axis, from its apex to its baſe, with a blunt apex or point. It therefore hath one ſide pretty plain or flat, and the other round or convex. It lies tranſverſely, and ſomewhat obliquely, with its broad end or baſis towards the right, and its apex or point towards the left ſide; the apex being ſomewhat lower than the baſis.

The heart is covered all over with a very ſtrong and tough membranous bag, called

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pericardium. This bag is firmly faftened to the great veffels that enter into, or iffue from the heart, and to the mediaftinum and fternum, it is not connected with the diaphragm, as in the human fubject. The pericardium is loofe from the body and apex of the heart; and, as it is larger than the heart contained in it, it allows it room and liberty to be contracted and dilated freely, and without confinement.

The outer furface of the pericardium being fpread over with the cellular fubftance, gives it a rough appearance; but internally, it is very fmooth and highly polifhed, and contains a watery warm vapour called *liquor pericardii.*

This liquor, in our fubject, in a healthy ftate, is but fmall in quantity, and proportioned to the fize of the heart, it varying in

proportion

proportion to the ſize of the animal. It is either limpid yellowiſh or reddiſh, and ſub-viſcid or gelatinous. It is of a lymphatic nature, and is found to harden by heat into a jelly. It is ſeparated without any intermediate glandules, or any viſible pores, from the ſmall exhaling arteries of the heart, auricles, and pericardium.

This *liquor pericardii*, by diſeaſe, is ſometimes increaſed to a very conſiderable quantity: it then conſtitutes a dropſy of the pericardium. On the other hand, if its quantity is dried up, diminiſhed, or any how deficient, the pericardium, in conſequence of inflammation, adheres to ſome part of the heart, or to its whole ſurface, by which the action of the heart is greatly impeded, and death is the conſequence.

The pericardium ferves to add to the firmnefs and fupport of the heart, it being, as we have faid, not only faftened to the great veffels, but to the mediaftinum and fternum. It likewife contains within it a watery warm vapour, to preferve the furface of the heart moift, fmooth, and pliable to its inceffant reiterated ftrong contractions and dilatations; therefore all animals that have two ventricles to their hearts are furnifhed with a pericardium.

The heart itfelf may be divided into its body, and two appendixes called auricles. Its body comprehends two large cavities called ventricles. Both the auricles and ventricles are commonly diftinguifhed by the names of right and left; though, confidering the true pofition of the heart in the horfe, they might be more properly termed anterior and pofterior; but we fhall retain the ufual names, of right and left.

The

The *Heart*—Is ſituated, as we have ſaid, in the left ſide of the thorax, and within its ſac or pericardium, where it is ſupported and retained in its ſituation by the large blood-veſſels which open into or iſſue from it; its baſe being the moſt elevated part, facing the dorſal vertebræ; its apex or point, the loweſt, is directed to the left ſide of the ſternum. Its fabric appears to be compoſed of muſcular and membranous fibres, running in various directions, very difficult to unravel.

Auricles—Are two muſcular and membranous bags or appendages ſituated on the baſe or broad end of the heart. They are divided by a ſeptum or partition, and have no communication with one another. They are likewiſe divided into the right and left auricles, and each correſponds with its ventricle on the ſame ſide. Their office is to receive the blood from their correſponding veins,

and,

and, when filled, the blood, partly by its own gravity, together with the mufcular contraction of the auricles, on the opening of certain valves, falls down into their refpective ventricles, where, from the particular conftruction of the parts, hereafter to be defcribed, the blood is, by the mufcular contraction of the heart, thrown into the arteries which convey it to its deftination.

Ventricles—Thefe are two large cavities within the mufcular body of the heart, fituated below their refpective auricles, and are, like them, termed right and left, or, more properly, anterior and pofterior. Each of thefe ventricles have two openings, one from the auricle above them, the other more laterly, which forms the mouth of a large artery, and which receives the blood. The ventricle, when it contracts, propels the blood into its correfponding artery. The right ventricle conveys it to the lungs; from

from thence it is returned by the veins to the left auricle and ventricle, which diſtributes it throughout the whole body, the lungs excepted.

The right ventricle is the wider and ſhorter of the two; the left the narrower and longer, reaching farther towards the apex of the heart than the other. The left is likewiſe much ſtronger, and its walls thicker. There is a very thick impervious ſeptum or partition betwixt them, hindering all communication between, or opening into one another. The ventricles in an adult human ſubject, when diſtended, contain each between two and three ounces of blood. Dr Bracken alleges the ventricles in the heart of a horſe throws out at each contraction four times as much blood as that of a man; but regard muſt always be had to the ſize of the heart. The right is generally reckoned the more capacious of the two; but,

but, in the live body, they muſt be pretty nearly equal, as will appear from an account of the action of the heart.

Both the body and auricles of the heart, beſides blood-veſſels, nerves, membranes, and fat, conſiſt of different ſtrata, or layers of muſcular fibres, running in various directions. Here it may be ſufficient to obſerve, that ſuch is their poſition and courſe, that every part of the cavity, both of auricles and ventricles, by their contraction, is ſo preſſed upon as to be entirely evacuated; though the thickneſs is very unequal in different parts of the wall of the heart.

Into each auricle large trunks of veins open. Into the right, the *vena cava aſcendens* and *decendens*; or, as ſome call them, anterior and poſterior, which, meeting at that auricle, form a large pouch or ſinus, called

called *ſinus venoſus* of an uneven ſurface, having indented edges hanging downwards, ſomething like the comb of a cock.

The two or more large trunks of the veins, belonging to, and returning from the lungs, called the pulmonary veins, in like manner form a ſinus, opening into the left auricle.

The right ventricle ſends out of its upper and wider part a large arterial trunk, called the pulmonary artery, which is diſtributed through the ſubſtance of the lungs, dividing into ſmaller and ſmaller veſſels, and branches as it proceeds.

The left ventricle ſends out likewiſe from its upper and wider part another large arterial trunk, called the *aorta*, or *arteria magna*, which

which by its ramifications is diſtributed all over the body.

We have then two auricles and two ventricles; the auricles opening into their reſpective contiguous ventricles; the auricles receive each a large venous pouch or ſinus; and the ventricles ſend out each a large arterial trunk. Let us now begin to conſider the action of the heart, and rudely ſketch out the courſe of the blood from and back again to the heart, commonly, and not improperly, called its circulation; which ſhall be more accurately and minutely deſcribed afterwards.

But firſt let us remind the reader of what was ſaid in the definitions concerning a muſcle; viz. that it's eſſential characteriſtic is to conſiſt of fleſhy fibres, which, when acting, contract themſelves; that therefore,

if

if the mufcle be in the form of an hollow veffel, fuch as the heart is, and contains a liquid, it will by it's action endeavour to expel that liquid. This, we muft keep in mind, and affume as known, until we come to treat profeffedly of mufcular motion.

The blood returning through the leffer veins, from the different parts of the body, is at laft gathered into the two large venous trunks already mentioned; viz. the *cava afcendens* and *defcendens*, or anterior and pofterior, which meet at the right auricle. This conflux or finus opens principally into the right auricle: The auricle and finus, when filled to a due degree, being irritated by the blood filling and diftending it, contracts by its mufcular power, and propels its contents into the right ventricle, with which it hath a patent communication.

This ventricle, when ſufficiently fill-ed, partly by the blood which filled the auricle, and partly from that which comes into it directly from the ſinus, on the open-ing of the valves, without touching at the auricle at all, (for as the ventricle is greatly more capacious than the auricle, all the blood the latter could throw into it could not ſufficiently diſtend it, and furniſh ſuch a quantity as it throws out at every contrac-tion): The right ventricle, when ſufficient-ly filled and diſtended, likewiſe being irri-tated, exerts its muſcular power, and by its contraction forces the blood it contained in-to the pulmonary artery, that riſes out of it, and ſo through the lungs; from which it returns by the pulmonary veins into the left auricle, from thence it is propelled into the left ventricle, which ſends it into the aorta, and through its ſmall branches diſ-tributes it over all the body. From the

ſmalleſt

ſmalleſt branches of the aorta it is taken up by the ſmalleſt veins, which are only the minute arteries continued, and turned back towards the heart; and by them it is again returned to the venous ſinus and right auricle; and this circulation is inceſſantly reiterated.

To repreſent it ſtill more compendiouſly, the blood from the conflux of the *cava aſcendens* and *deſcendens*, or anterior and poſterior, flows into the right auricle, and from thence into the right ventricle. From the right ventricle it is ſent into the lungs through the pulmonary artery, and by the pulmonary vein returned to the left auricle, from that into the left ventricle; out of which it is propelled through the aorta, and by its minute ramifications diſtributed all over the body; then being taken up by the beginnings of the veins, is again brought to the

the right ſinus and auricle; and this rout is renewed and continued without ceaſing.

This is a rude ſketch of the courſe of the circulating vital fluid, of which we have as yet only drawn the outlines, that the beginner might not be embarraſſed by attending to too many things at once. We ſhall, as we proceed, finiſh higher, and add more truth to the piece.

And, firſt, let us obſerve, that the muſcular contractions of the auricles are not performed in the ſame ſucceſſive order of time we were obliged to mention them in for method's ſake; but the two auricles contract at once; and, during their action, the ventricles are paſſive, ſuffering themſelves to be dilated and filled.

And *vice versa* the two ventricles, when completely filled, contract at one and the same time; and while they are contracting, the auricles are filling. In this manner are the auricles and ventricles alternately filled and evacuated, as appears not only from the nature of the thing, but from the opening of live animals. These alternate contractions and dilatations of the heart are called its systole and diastole. During its systole or contraction, the blood is pressed from the ventricle into the arteries. In the diastole or dilatation, the ventricles are passive, and receiving the blood from the auricles.

Now that these alternate contractions and dilatations, these fillings and emptyings might be performed completely and truly, with an uniform and regular constancy, nature (by which is always to be understood the supreme author of nature) hath placed wonderful

derful contrivances where they are requir-ed; which we ſhall now briefly explain.

When the right auricle and ſinus is con-tracting, the current of the blood flowing towards the auricle, together with the weight of that portion of it which returns from the head and upper parts by the *vena cava deſ-cendens*, or arterior, determines the blood contained in the right ſinus and auricle up-on their action into the contiguous ventricle.

From the mouth of the ventricle there ariſes all around a membranous broad ring, which is undivided at its origin, but, when extended into the cavity of the ventricle, parts into three unequal portions or ſcollops, the extremities of which being ſtrengthen-ed by tendinous fibres, are fixed partly to the walls of the ventricle, and partly to the fleſhy columnulae within it; but in the in-

termediate

termediate ſpaces, betwixt their origin from the mouth of the ventricle to their fixed points within it, are free and looſe. Theſe three unequal portions of this membrane, being ſomewhat triangular, are called *valvulae tricuſpides.*

While the blood, by the contraction of the ſinus and auricle, is paſſing into the ventricle, this membrane and its ſcollops give way to the current, being preſſed to the ſides of the ventricle; and particularly the largeſt portion is made to cover the paſſage into the pulmonary artery, that no blood may get into it by the feeble effort of the auricle, but wait for the due *impetus* from the ventricle.

When the ventricle, being ſufficiently filled and irritated, contracts, its cavity being every way diminiſhed (and when the contraction

traction is completed, the cavity is quite annihilated, the ventricle being perfectly emptied) the blood feeking an outlet every way, and getting between the walls of the ventricles and the loofe parts of the membrane or valves, drives them inwards towards the axis of the ventricle, and towards the auricle and finus, fo as to hinder the return of the blood by the way it came. They are ftayed by their infertions into the walls and columnulae of the ventricle; and hindered from being driven too far back and ftrained. At the fame time the orifice of the pulmonary artery, that before was covered by the largeft of the valvular portions, is now left open; and it being the only outlet the blood can find, its courfe is all determined that way, and it rufhes into the pulmonary artery with the full force of the contraction of the ventricle.

There

There is another contrivance much of the ſame kind, to hinder the return of the blood into the left auricle and ſinus, when the left ventricle is contracting; with this difference, that, inſtead of three in the right, there are in the left only two membranous productions or valves, and theſe, from ſome ſimilitude to a mitre, are called *valvulae mitrales*.

There are beſides, at the mouth of the pulmonary artery, and at the mouth of the aorta, in each of theſe places, a ſet of valves, three in each ſet, called from their figure *ſigmoideae* or *ſemilunares*. Theſe, when the blood is expelled out of the ventricles by their contraction, give way, and are preſſed flat againſt the walls of the arteries. But when the ventricles are emptied, and the arteries begin their contraction, the blood, ſeeking an exit every way, gets between the loofe margin of the valves, and the walls of the arteries, and forces all three back at once. Thefe valves are of fuch a figure, that when preffed fully back, they are united nearly into the figure of a circle (like the head of a drum). But as, without fome fpecial provifion, there would be fomething of a vacancy in the middle of this circle, of a triangular figure, nature hath placed, in the middle of the margin of each valve, a round flefhy fubftance or papilla; all which three, when preffed together, fill up fo much fpace, and ftrengthen the middle weak fpot, making the valves play firm and true.

All thefe different fets of valves, viz. the *tricufpides* at the entry of the right ventricle; the *mitrales* at the entry of the left; and the two *femilunares* at the mouths of the great arteries, that iffue from the ventricles, may be compared in fome meafure to locks made

made on navigable canals, which, when a boat hath got ſo far, by being ſhut after water is let in, prevent the boat from being driven back, and ſecure the progreſs already made.

Theſe valves are more conſpicuous and robuſt in the left ſide of the heart than in the right, as the left ventricle is vaſtly thicker, and better ſtored with muſcular fibres; and therefore, contracting with greater force, requires a firmer ſtructure of valves to ſtand the ſtreſs they are put to.

But, over and above all this, there are within each ventricle, and in an inferior degree within each auricle, fleſhy muſcular productions or columns, which we have had occaſion to mention before, ſome running one way, and others another, firmly attached at both ends to the ſides or walls of the ventricles.

Theſe columnæ or pillars ſerve a variety of purpoſes. They prevent the heart being too much ſtrained or diſtended during its diaſtole or dilatation. They likewiſe aſſiſt in the ſyſtole or contraction of the heart, by contributing their ſhare of muſcular contraction, as they conſiſt of fibres of the ſame nature and properties with thoſe of the walls of the ventricles. They conquaſſate and help to keep fluid the blood, which is ſo often and ſo repeatedly daſhed againſt them; and, by giving a degree of ſupport to the valves, they direct and determine their motions. And, by filling up room, they render the complete evacuation of the ventricles practicable, which could not be brought about otherwiſe, as an hollow muſcle, if it were quite ſmooth and even in the inſide, could

could not by contraction altogether annihilate its own cavity.

So many various and important ends hath nature gained at once by this plain and ſimple mechaniſm.

The heart, beſides the great veſſels that either open into it or iſſue from it, hath proper veſſels of its own, called coronary, pervading its ſubſtance, and ſupplying it with vital fluids, both arteries and veins. The arteries, almoſt always two in number, ariſe from the great trunk of the aorta, a little beyond the ſemilunar valves, and furniſh the heart with innumerable branches. RHUYSCH hath given an excellent figure of their origin and diſtribution.

The evaneſcent branches of theſe arteries terminate in beginning veins, as in other parts

parts of the body; and the trunks of these veins empty their blood some of them into the right sinus and auricle, others into the right ventricle; and some, but fewer, into the left sinus and auricle, and left ventricle.

By this means the heart is supplied with the vital stream expeditiously to influence its restless and rapid functions.

The heart is supplied with nerves from the cardiac plexus, and from the lowest cervical, making various inosculations with the intercostal, and joining with those of the eight pair.

CHAP.

CHAP. IV.

Some Diſeaſes of the HEART. *Circulation through the* ARTERIES *and* VEINS. *Of* ANEURISM; *and* VARIX.

WE have in our laſt chapter, after explaining the ſtructure of the heart, exhibited a general ſketch of the circulation of the blood; and diſcourſed particularly and minutely on theſe circumſtances of it, which immediately concern the heart itſelf; and, in ſo doing, have given an account

count of the action and uſes of its different parts.

We have ſeen the rout of the blood to be from the meeting of the two trunks of the antèrior and poſterior venae cavae into the right ſinus and auricle of the heart; from thence into the right ventricle; from thence through the pulmonary artery into the lungs; from which it returns by the pulmonary veins to the left ſinus and auricle; from thence it is ſent into the left ventricle; out of which it is expelled through the aorta, and by its infinitely numerous ramifications diſtributed all over the body; and at length is taken up by the beginnings of the veins, which are a continuation of the moſt minute evaneſcent arteries; and by them returned to the right auricle and ſinus, from which we conſidered it at its firſt ſetting

ting out. And thus it repeats its inceſſant round.

We have ſeen that the auricles and ventricles of the heart act by their muſcular force, and that this force is excited by the irritation of the blood thrown into them ſucceſſively, and diſtending their cavities; and therefore the contraction and dilatation, or ſyſtole and diaſtole of the auricles and ventricles, muſt be alternate.

We have likewiſe conſidered the wonderful contrivances of nature to make all theſe motions true and complete, in valves which hinder the blood from being beaten back towards the places from whence it came; and the fleſhy inequalities or columnae in the inſides of both auricles and ventricles, eſpecially the latter, by the aſſiſtance of which, beſides other important ends, the complete evacuation of theſe cavities is effected.

We ſhould now proceed to conſider what remains next to be particularly explained of the circulation, in that part of it which immediately relates to the arteries and veins.

But while the ſtructure of the heart is freſh in the mind of the reader, we ſhall, agreeably to our plan, take notice of ſome of the moſt remarkable diſeaſes of that part, in order to give a general idea of their nature, and the general curative indications where they are curable, which will ſhow the uſefulneſs and connection of the knowledge of the animal oeconomy with that of diſeaſes and their cure.

The

The firft difeafe we fhall take notice of is the dropfy of the pericardium.

We obferved, that the principal ufe of the pericardium is, by its clofe impervious ftructure, to confine within its cavity a warm aqueous animal vapour, to moiften and lubricate the furface of the heart; and thereby to preferve it in a fit condition to continue its inceffant rapid actions; and, therefore, that every animal, whofe heart hath two ventricles, is furnifhed with a pericardium.

This vapour muft be fupplied by extremely fmall veffels opening into its cavity, either from the convex furface of the heart, or the concave furface of the pericardium, or both. It cannot come from without the pericardium; for the fame impervious ftructure that confines it when collected,

collected, muſt exclude its admiſſion from without.

It muſt likewiſe be conſtantly renewed, that is, ſome of the old muſt be reabſorbed, while the new is gathering. If it were always accumulating without any part being carried off, the heart would ſoon be drowned in water. If there was no freſh vapour ever admitted, what is already within the pericardium would in proceſs of time become rancid and acrid, and therefore unfit for its purpoſe, from the nature of animal juices, which tend to alcaline acrimony, eſpecially when pent up in ſo warm a place.

Therefore there muſt be a conſtant renewal of this vapour; and that the ſame, or nearly the ſame quantity of vapour may be kept up, there muſt be the ſame, or nearly the

the ſame, quantity furniſhed, as there is abſorbed.

But if the quantity reabſorbed is remarkably leſs than that furniſhed, the quantity of vapour muſt gradually increaſe. And as the vapour is only water or lymph impregnated with animal principles, and rarefied; as its quantity increaſes, ſince it cannot make its eſcape through the pericardium, it will become denſer and denſer, and at length become downright palpable water.

This is the origin of water or dropſy in the *pericardium*; and not only of this one ſort of dropſy, but of every kind that is formed within any remarkable pre-exiſtent cavity whatever. Such is the importance of the knowledge of the animal œconomy in the practice of phyſic.

Thus

Thus an afcites or dropfy in the abdomen is only the fame thing happening within the peritonaeum, which we have been now explaining, concerning the pericardium. In the cavity of the abdomen there is a vapour, which hinders the parts from growing together, and to the peritonaeum. This vapour is very obfervable in opening a new killed animal, while it is warm.

If this vapour is not abforbed in proportion as it is furnifhed, an afcites enfues, and not as hath been imagined by fome anatomifts, from the rupture of lymphatic veffels.

The general caufes of dropfies are a poornefs of blood, whereby its watery parts abound too much, and are too eafily feparable from its other principles; together with a weaknefs or laxity of the folids.

The

The indications of cure are, befides letting out the burthenfome water by chirurgical operation, where it is practicable, the difcharging it by hydragogue purges, and diuretics, thereby promoting its reabforption by emptying the veffels, and reftoring the tone of the folids by proper ftrengtheners, friction, and exercife. A drying diet is here indifpenfibly requifite.

Water is collected in the fame manner in the thorax, between the folds of the mediaftinum; and which is called hydrops pectoris; in the ventricles of the brain, and there it creates lethargy or apoplexy; within the fcrotum, and in other places.

Anafarca is an effufion of water in the tela cellulofa, inftead of fat, or a gelatinous fluid, as hath been hinted in the introductory chapter; and differs from afcites, and other

other local dropſies, by having no circumſcribed ſeat; we only mention theſe local dropſies at preſent, as they will fall more properly to be conſidered hereafter.

The next diſeaſe we ſhall touch upon is polypus of the heart.

This is a fleſh-like concretion found in the ventricles of the heart, or the beginning of the trunk of the aorta. We do not mean theſe ſlight coagulations, which are found within the heart in moſt ſubjects, and which are formed there in the agonies of death, when the heart contracts ſo weakly as not to expel all its contents, and ſo gives the blood time to form into clots by ſtagnation in its cavity. But we mean theſe more ſolid concretions, which are rooted amidſt the fleſhy productions or columns of the ventricles; and which by their firmneſs nefs evidently appear to have been of fome confiderable ftanding.

But the caufes of both are the fame: Part of the blood thrown into the ventricle remains there amidft the interftices of the flefhy productions; and, not being afterwards expelled, becomes the nucleus or bottom, to which every fucceeding impletion of the ventricle gives a new addition of fubftance, by the adhefion of fome part of it, efpecially its ferum, to the nucleus. The ftrong action of the heart compacts all into a firm fubftance, and makes it faft to the walls of the ventricles, amidft the interftices of the flefhy productions, by the attraction of cohefion. In the mean time, its bulk increafing, it extends itfelf in different directions, and multiplies its root or feet; whence it hath its name, *polypus*, that is, *multipes*, many-footed; and creates uneaſy ſymptoms, the principal and moſt diſtinguiſhing of which is a grievous palpitation of the heart upon ſlight motions of the body; and at length death is cauſed by its motion being totally ſtopped.

In the human body, thoſe perſons are moſt liable to polypus of the heart whoſe blood is very thick, and who are of an atrabilarious temperament; eſpecially if they at the ſame time are liable to fainting fits; which gives the blood opportunity and time to coagulate within the heart.

There is no certain cure mentioned by authors for this dreadful diſeaſe in the human body. What ſeems to bid faireſt for one is the conſtant uſe of ſoap, or a proper lixivium, waſhed down with great quantities of a decoction of graſs roots, or of

graſs

grafs itfelf in the fummer, continued for a long time together.

The virtues of grafs and its roots have long been known and recommended by the moft eminent phyficians as a powerful diffolvent of thofe concretions, which take place in the human billiary ducts, and mention cafes where it has been prefcribed with the greateft fuccefs*, and we have every reafon to think, that it will be equally powerful in diffolving cohefion in the animal fluids.

The heart and pericardium, like other vifcera, are liable to inflammation. This diforder is called *carditis*, and not eafily diftinguifhed from inflammation of the lungs or mediaftinum.

* Van Sweiton in his Commentaries upon the Aphorifms of Dr Boerhave, Vol. IX. p. 177.

mediaſtinum. But on carefully attending to the ſymptoms in the carditis, the breathing is leſs difficult, together with a ſmall quick irregular pulſe, from the firſt attack of the diſorder, which muſt be treated in the ſame manner as all local internal inflammations by adhering ſtrictly to the antiphlogiſtic regimen.

Having already conſidered the motion of the blood through the heart in all its parts, we ſhall next trace its courſe through the arteries and veins, and explain their different offices, their ſtructure, and their manner of being branched out and diſtributed.

As we have ſaid before in the definitions, arteries are canals or veſſels, which convey the blood directly from the heart to the other parts of the body. They are in colour whitiſh, and more ſo in dead ſubjects than in living bodies, as the ſmall veſſels,

that

that run along their membranes, are then empty and collapſed. They are conical, tapering gently from the heart forwards, which appears moſt evidently in the larger arteries, where they run for any length without ſending off branches. But, as the number of branches increaſes by diviſion and ſubdiviſion, they gradually come nearer to a cylindrical figure; till at length, in the ſmalleſt branches of all, which are termed capillaries, (that is, as ſmall as hairs), though in reality they are much ſmaller, their figure is altogether cylindrical. Theſe capillaries are continued to the origins of the veins, the latter being no other than the former reflected or turned back towards the heart.

At every diviſion of an arterial trunk into branches, the ſum total of all the cavities of the branches is always greater than the cavity of the trunk, from which they immediately proceeded.

Hence

Hence the cavities of all the capillaries taken together muſt be immenſely greater than the cavity of the aorta, where it iſſues from the heart.

Such arteries as are large enough to be examined by anatomical methods of enquiry have been found to conſiſt of the following different coats or membranes.

The outermoſt of all is an adventitious thin membrane, continued from the general membrane of the neighbourhood where the artery runs ; as in the thorax from the pleura, or from the pericardium ; in the abdomen from the peritonaeum ; in paſſing through the cranium from the membranes of the brain, &c. This coat is, as we have obſerved, adventitious, and only follows the artery for a ſpace, and then abandons it ;

and

and therefore is properly ſpeaking no part of the artery.

The next coat is found to be cellular, and of the texture we have deſcribed in the introductory chapter. In this coat the texture becomes cloſer and more compacted, as it approaches nearer to the cavity of the artery.

The coat immediately under the former is muſcular, or at leaſt fibrous and muſcular like. Its fibres are circular; not indeed continued quite round; but diſpoſed in a better manner for coheſion and ſtrength; as each of them deſcribes the far greater part of a circle; then, as it were ſinking down, is faſtened to the reſt of the ſame kind. This happening to different fibres in different parts of the cylindrical wall of the artery; and there being ſeveral ſtrata

ſtrata or layers of ſuch fibres, makes a firm coat, and conſtitutes the chief ſtrength of the artery, either to reſiſt dilatation and rupture, or to reſtore itſelf, when diſtended, to its former narrowneſs.

This ſeries of circular fibres appears in ſome places of the aorta to be fleſhy and truly muſcular.

Immediately under the laſt mentioned coat, betwixt it and the innermoſt of all, there is ſome cellular ſubſtance, which, being very ſhort and minute, is difficult to be demonſtrated; but, after long maceration in water, is to be ſhewn.

The innermoſt coat, or that which the blood rubs againſt in gliding along, is a fine thin membrane, ſmooth in the inſide, being poliſhed by the current fluid. By due

due maceration, it may be ſeparated from the cellular texture that lies between it and the muſcular coat.

It ſerves as a lining to the other coats; and to hinder the globules of blood from ſeparating and tearing aſunder the muſcular fibres; and therefore contributes not a little to the ſtrength and durableneſs of the arterial frame.

Beſides theſe coats and membranes, there are blood-veſſels, both arteries, veins, and nerves, that run upon the coats of the larger arteries. Theſe run in the outermoſt cellular ſubſtance, under the firſt and adventitious coat. Theſe arteries by ſucceſsful injections appear very numerous, as may be ſeen in Rhuyſch's figures.

The veins arife, as we have before obferved, from the fmall evanefcent arteries at the furface and extremities, becoming cylindrical, and turned towards the heart. From numbers of fmall twigs uniting larger and larger trunks are gradually formed, till at length they are gathered and united into the great venous trunks that open into the heart.

They are, like the arteries, branched out in fuch a manner, that the fum total of the diameters of the branches is always greater than that of the trunk they compofe.

Their coats are thinner than thofe of the arteries, (which thinnefs renders them in fome meafure tranfparent,) but their texture is clofer; and, according to late experiments, they are found to be tougher and ftronger,

in

in proportion to their thicknefs, than that of arteries.

They are very difficultly feparable into diftinct feries of membranes; and it is but in a few places where any thing like muf-cular fibres can be found in them.

When they are emptied and cut through, they do not maintain their circular fections as the arteries do, but fall flat, and difcover lefs elafticity.

They are both larger and more numer-ous than the arteries, as may appear from the many large cutaneous veins on the fur-face of the body, that have no arteries cor-refponding to them. Infomuch that the fum total of their cavities may be fairly reckoned four or five times larger than that of the arteries.

Within

Within their cavities in many places there are valves, that is, pretty ftrong membranous fubftances, the one end of which is fixed to the infide of the walls of the veins, and the other projects loofe into its cavity towards the heart. They are moft commonly placed together in pairs, fometimes fingle, and fometimes triple. Their ufe is to prevent the blood's being beaten back through the veins by any force or preffure, whereby the uniform reflux of the blood to the heart might be difturbed. And fo truly are they adapted to that purpofe, that if we try to inject any fluid into a venous trunk furnifhed with valves, from the heart towards the extremities, it will burft before the valves give way ; and hence the venous fyftem cannot be injected and demonftrated like the arterial.

Having

Having delivered the ſtructure and principal properties of the arteries and veins, we come now to explain minutely, the way and manner in which the circulation of the blood is carried on from the left ventricle of the heart, and the beginning of the aorta, back to the right auricle; that is, the motion of the blood through the arteries and veins.

Let us then ſuppoſe the left ventricle already fully diſtended with blood juſt beginning its ſyſtole or contraction. At this preciſe point of time, the arteries are the emptieſt, having immediately before reſtored themſelves by their contractility to their greateſt narrowneſs. The ventricle by its muſcular force, which is very great, throws its contents into the aorta. The blood behind puſhes on that before; that before creates a reſiſtance to that coming behind through the whole

arterial

arterial fyftem. As the arteries, by being divided and fubdivided, become gradually fmaller and fmaller, the refiftance is gradually increafed by the increafe of the furface, and the friction which is proportionable to the furface, and therefore at the capillaries is greateft of all, in which microfcopes have fometimes fhown a fingle red globule of blood filling the whole cavity of the veffel. This refiftance is fomewhat inhanced by the tapering figure of the arteries.

Hence when all the blood is thrown out of the ventricle, the arteries, by the quantity and impetus of the blood thrown into them, and by the refiftance it meets with in its progrefs, efpecially in the capillaries, muft be diftended, as they are yielding and dilatable; and this ftate of diftention, which is called their diaftole, muft keep time

time with the contraction or syſtole of the heart.

But when the arteries are fully diſtended, as the impetus ceaſes, the diſtending fluid being no more ſupplied, they will be left at liberty to contract themſelves, which they do either by the muſcular action of their circular fibres, or by their natural elaſticity, or both, (but we believe much more by the latter than the former), and ſo endeavour to expel the blood out of their cavities, which, agreeably to the nature of a fluid, will endeavour to recede from the preſſure wherever there is a paſſage.

But there can be no other way for the current of blood to make its eſcape, but either back towards the heart, or forwards into the veins,

veins, unlefs the arteries fhould burft, which is out of the queftion.

Now, in the effort the blood makes to return to the heart, it forces back the three femilunar valves at the mouth of the aorta, which, when fully acted upon, are united together into one complete circular furface, fo as to fhut up its cavity, as we have already explained, and prevents all regurgitation that way, except perhaps into the orifices of the coronary arteries.

As the veins are in their beginnings extremely fmall, being only the arterial capillaries continued and reflected or turned towards the heart, and, by uniting, form gradually larger and larger trunks, the blood will be urged through them with a pretty conftant and uniform current: for both the diaftole and fyftole of the arteries will

will keep it urging on. This current, the larger the veins are, and the nearer to the heart, will be the more rapid ; becaufe the diameter of the cavity of every trunk of a vein is lefs than the fum total of the diameters of all the branches that compofe it, though it is always larger than any one of them fingly. Hence, therefore, the velocity of the motion of the blood, in the two great trunks of the anterior and pofterior cavas, will be the greateft of all, where they open into the right auricle and finus, fufficient to fupply the neceffary quantity of blood to be propelled and pafs through the heart.

The dilatation or diaftole of the arteries is called the pulfe ; which is fo much attended to in the practice of phyfic. The veins have naturally no pulfe, becaufe in them the blood flows from fmaller canals into wider ; its current into their beginnings is more equal and uniform; and the ſtop, or remora at the right ſinus and auricle, is next to nothing; for while they are filling, the venous blood is proceeding on, and while they are contracting, there is room making for it to be accumulated; ſo that in a natural ſtate there is no cauſe worth conſidering to drive it back into the venous ſyſtem; and therefore the venous ſyſtem can naturally have no pulſe, at leaſt none that can be diſtinguiſhed in any vein ſo remote from the heart, that we can examine it in. Beſides, their ſtructure is not ſo ſuſceptible of pulſe as that of the arteries, even though the ſame cauſes ſhould be ſuppoſed to act upon them; as they are not eaſily dilatable beyond their common tone, nor have they that contractile power to reſtore themſelves, when dilated, that the arteries have.

On

On the other hand, the arteries are eaſily dilatable, and capable of again reſtoring themſelves; they are filled with great force and rapidity, by the ſudden ſquirt of the left ventricle, and the reſiſtance at their capillary terminations is very great.

We have obſerved, that the veins have no pulſe naturally; but in dying animals there has been ſometimes perceived a fluttering in the veins, reſembling a pulſe, occaſioned by an extraordinary ſtop at the heart, which cauſes a repulſion of the blood from the right auricle into the trunks of the veins at the heart.

Thus, we have hitherto gone through the action of the heart and the motion of the blood through it; and its courſe through the arteries and veins back to the heart, through the greateſt part of the body, which

which is called the major or greater circulation.

There remains now, to complete our account of the circulation, to deſcribe its paſſage through the lungs, being the minor or leſſer circulation; but as reſpiration is neceſſary to expedite that paſſage, and as that function demands a particular chapter by itſelf, we ſhall here only obſerve, that the modus of the circulation of the blood thro' the lungs is in general the very ſame with that in the reſt of the body; the blood is thrown out of the right ventricle of the heart into the pulmonary artery and all its ramifications. The pulmonary artery hath ſemilunar valves near its origin like theſe of the aorta, which hinder the regreſs of blood towards the heart. Theſe arterial branches no doubt have ſome kind of pulſe like the branches of the aorta; and propel in the

ſame

ſame manner their blood into the beginnings of the pulmonary veins; and at length to the left auricle. So far they agree with the veſſels of the reſt of the body. The material difference as we have ſaid is, that reſpiration is neceſſary to co-operate with the action of the right ventricle, in order to propel the blood through the lungs. In the meantime, if we aſſume this as explained, we have had the whole of the circulation before us.

We have already mentioned the velocity with which the blood comes from the heart, together with the celerity and force with which it is driven through the arterial ſyſtem, which demonſtrate the great muſcular powers of the heart, eſpecially if we take in to the account, the great reſiſtance that complex muſcle overcomes in the capillary veſſels, from friction, tenacity of the blood, &c. together

with

with the weight of the whole mafs of blood in the body, the quantity of which, in our fubject, the prefent ftate of veterinary experiments have not as yet nearly afcertained, but in the human body it is computed to be about 51 lib. and upwards. Yet that great mafs of fluids, although become ftagnant in perfons recently drowned, or that have fainted, are eafily put into their former motion by the heart only.

It is likewife computed that the heart in man drives forward a weight of 51 lib. of blood, with a velocity by which it might run 149 feet in a minute, which force it exerts 4,800 times in an hour, yet notwithftanding this inceffant perpetual motion of the heart, we are never fenfible of its being tired through fuch a number of years as there is in one's life. Through fo many days as there is in a year, or through fo

many

many hours as there are in a day, when in each hour the heart of a perſon in health, contracts not much leſs than 5000 times. So frequent does theſe repletions followed with new contractions go on perpetually in the ſame order. Nor is there any muſcle beſide the heart and diaphragm but what becomes tired, weared, and painful, by acting inceſſantly even for a few hours only.

The dilatation or diaſtole of the arteries is called the pulſe, which is ſo much attended to in the practice of phyſic, and ought to be carefully attended to by every veterinary practitioner, by making themſelves acquainted with it firſt in a healthy ſtate, by which they will be enabled to judge how far it may be deranged in diſeaſe.

The pulſe varies in its motion in differ-ent animals, and even in the ſame ſpecies it varies in proportion to their ſize. Small animals have a quicker pulſe than the larg-er; young than the adult. We ought to keep this always in mind, and likewiſe to be careful that the animal whoſe pulſe we are making our obſervations on, be noways alarmed or frightened. In ſmall horſes a-bout 12 or 13 hands high, the pulſe will beat about 49 to 54 ſtrokes or pulſations in a minute, in larger horſes from 44 to 50. But in diſeaſe, the action of the heart and arteries are very materially influenced, by which the circulation of the blood may be increaſed or diminiſhed, according to exiſting circumſtances, and the nature of the diſeaſe at the time.

The principle diſeaſe to which the arte-ries are liable, are aneuriſm and oſſifica-

tion.

tion, the former are of two kinds, the true aneurifm and the fpurious. Although this difeafe is feldom met with in the extremities of our fubject, yet it is neceffary for the veterinary furgeon to be informed of its nature; the method of cure when neceffary, as it is connected with the treatment of wounded arteries, or when they may be divided in performing operations.

The true aneurifm is an enlargement or dilatation of the coats of an artery, without a breach or effufion of blood; and from cafes that have occurred, in diffecting horfes, there is every reafon to fay, that they take place more frequently in the larger internal arteries in horfes than is imagined, and that fudden death is fometimes occafioned by their burfting. It is found that aneurifms happen moft frequently in the human body, where the blood ftrikes with the greateſt force upon the ſides of an artery where there is a curve or bend in it.

A ſpurious aneuriſm is frequently the effect of a ſmall puncture or wound in the coats of the artery, penetrating into its cavity, by which means in every pulſation ſome blood is thrown out and extravaſated into the neighbouring cellular ſubſtance and interſtices of the parts; which being accumulated, and its more liquid parts being diſſipated, it coagulates and forms a tumor above the wounded part of the artery, without any pulſation, or at moſt with a very obſcure one.

From the account we have given of internal aneuriſms, no hopes of a remedy can be entertained. The ſpurious kind happening in the extremities, may in moſt

caſes

cafes admit of a remedy, by treating them as a recent wounded artery, which is to feparate the flefhy fubftance about the artery, if it can be done with fafety, and tyeing up both its mouths, by paffing a long blunt crooked needle (with an eye in the point, armed with a ftrong wax thread,) under the artery at each fide of the wound, and fecure it properly by the legature. This operation is called the operation for an aneurifm; but if the mouths of the divided artery fhould retract fo far within the flefhy parts as not to be got hold of, in that cafe the whole of the furrounding fubftance may be included in the ligatures. It is of great importance that the veterinary practitioner fhould be well acquainted with the courfe of the large arteries, by which he may avoid either dividing or wounding them in performing operations. Wounds in arteries are more or lefs dangerous to life, in pro-

portion

portion to their ſize, nearneſs to, or diſtance from the heart, and the great hemorrhage or loſs of blood that may follow.

Oſſification, in the coats of the arteries of horſes, ſeldom takes place but in thoſe who arrive at a greater age than common.

Varix, in the veins, like aneuriſm juſt deſcribed, are an enlargement or dilatation of the coats of the veins, forming a longiſh tumor, or ſwelling, conſiderably larger than the bulk of the other part of the vein. This takes place in horſes for the moſt part in the ſuperficial vein which paſſes over the inſide of the hock joint, forming a very viſible ſwelling, and is called a blood ſpavin. When it takes place ſuddenly, it is attended with pain, and of courſe lameneſs, and, in moving, with a conſiderable ſtiffneſs in that limb. The cure ought at firſt to be attempted by aſtringents and compreſſion of the

parts

parts by bandage, but if that ſhould not ſucceed, it muſt be treated in the ſame manner as an aneuriſm deſcribed above, treating it afterwards as a common wound.

Varix has always been conſidered as proceeding from an over diſtention of the parts, or of ſome accident; but, on more accurate inveſtigation, it has been found to proceed from compreſſion, of ſome kind or other, obſtructing the progreſs of the blood through the compreſſed vein.

CHAP.

CHAP. V.

OF RESPIRATION OR BREATHING.

WE have feen what life is, and wherein it confifts, particularly in the action of the heart, and the motion of the blood caufed by that action.

We have defcribed both thefe, and have traced the blood in its courfe through the auricles and ventricles of the heart into the aorta and its branches; and from thence through

through the veins back again to the heart.

But though this motion of the blood conſtitutes life, inſomuch that wherever that is, there we pronounce life to be ; yet, as we obſerved in the beginning, any degree of life would quickly be at an end, if there was no other animal function added to it. And the function moſt immediately connected with that life, and moſt requiſite to ſupport its duration, we have ſhown to be reſpiration. This we are at preſent to take into conſideration, and explain its nature, inſtruments, and effects.

Reſpiration is the alternate drawing and expelling air into and out of the lungs, whereby their cavity and volume, and that of the thorax or cheſt in which they are placed,

placed, is alternately enlarged and diminished.

That the nature and circumſtances of this function may be the more clearly underderſtood, it will be neceſſary to premiſe a brief account of the ſtructure, firſt of the thorax, and next of the lungs.

The thorax is a large cavity, ſomewhat in the ſhape of a cone, reaching from the under part of the neck to the abdomen or lower belly, from which it is divided by the diaphragm. The bones that form and guard its cavity are the vertebrae of the back, the ribs on each ſide, and the ſternum or breaſt bone; as the diaphragm, which parts it from the abdomen is not placed in an erect or perpendicular poſition to the trunk of the body, but ſlanting downwards and forwards. The cavity of the thorax is conſiderably ſhorter below than above. The ribs,

ribs, which form and guard the greateſt part of the cavity of the thorax, are all articulated with their reſpective vertebrae, in ſuch a manner as to admit of a motion forwards and backwards in brutes, but upwards and downwards in man, with ſome degree of rotation at their inſertion, like the motion of the ball and ſocket. They are likewiſe all connected and articulated with the ſternum or breaſt bone, by the intervention of cartilages, ſo as to admit of the ſame motion forewards and backwards.

The ribs are all more or leſs arched, being convex outwardly and concave inwardly, towards the cavity of the thorax. The ribs, as they go backwards, grow each gradually longer than thoſe above to the ſeventh; and they all become more oblique in their direction towards the ſternum. From which ſtructure it follows, that if the ribs are all moved forwards round their ar-

 ticulation

ticulation with the vertebrae, their arched middle parts will be puſhed outwards and laterally ; and, conſequently, the cavity of the thorax will be widened and enlarged.

There is a ſet of muſcles that perform this office, called the intercoſtals, both external and internal. They run obliquely from the edges of every rib, to thoſe of the ribs neareſt each other, for the whole length of the ribs ; and from the higheſt rib to the loweſt. The fibres of the external have a direction contrary to that of the internal, by which contrivance their joint action becomes the more ſteady, the ribs being pulled in the diagonal of theſe two directions ; that is, neither forwards nor backwards, but directly towards one another.

When theſe muſcles act, they endeavour, as we have ſaid, to pull the ribs nearer one another ;

another; but as the ribs are gradually the more moveable the lower they are, the firſt and uppermoſt having ſcarce any motion at all, by their joint action the whole ſyſtem of the ribs (except the twelfth or lowermoſt, which is faſtened to the diaphragm, and therefore follows its motion) is lifted forewards, and the cavity of the thorax widened and enlarged in the manner we have ſaid.

This widening of the thorax any one may experience in his own body. Apply a fillet or garter round the broadeſt part of the cheſt, and immediately after exſpiration obſerve the exact meaſure; then draw in the breath ſtrongly, and it will be found that a longer line will be required to go round than before, by an inch or more in a middle ſize.

There

There is ſtill another contrivance that ſerves to enlarge the cavity of the thorax, viz. the diaphragm or midriff. This muſcle, which, as we have ſaid, divides the thorax from the abdomen, like to a curtain, ariſes from the ſternum before, from the ribs on each ſide, and behind, from the laſt vertebra of the thorax and the firſt one or two of the loins. Its fibres run fleſhy from the circumference towards the centre ſome way, and then become tendinous. It hath, beſides muſcular appendixes, one on each ſide, ariſing from the third vertebra of the loins; which proceed upwards fleſhy, and are inſerted in the tendinous part. The whole diaphragm, as was obſerved before, does not divide the thorax from the abdomen in a perpendicular line, but inclines in a ſlanting direction from the vertebrae of the back, forward towards the ſternum, by which means the upper part of the thorax is conſiderably

longer

longer than its lower part at the ſternum. It is not plain, but convex towards the thorax, and concave towards the abdomen; inſomuch that its middle or centre riſes always higher in the thorax, than its origin at the ſternum.

When it acts, the fleſhy fibres ſhortening, pull the tendinous centre towards their origin, thereby rendering it plainer and leſs convex, and ſo lengthens the cavity of the thorax.

Here then is a double way of enlarging the capacity of the thorax; by the intercoſtal muſcles raiſing the ribs it is made wider; and by the action of the diaphragm it is rendered longer, or deeper. Let us proceed to ſhew for what purpoſes this mechaniſm is intended. But, before this can

be

be properly underftood, we muft firft explain the ftructure of the lungs.

The lungs are fituated in the cavity of the thorax. They are divided into two large parts called lobes; the one on the right; the other on the left fide, which are feparated from one another by a production of the pleura (that membrane which lines the whole cavity of the thorax.) This production, called mediaftinum, divides the thorax lengthways into two equal feparate cavities, that have no communication with one another; infomuch that if blood, or pus, is collected or water is poured into one of thefe, it can find no entrance into the other. But as the heart and pericardium, with the great veffels that open into it, and iffue from it, are contained in the left divifion, upon that account the left lobe of the lungs is confiderably lefs than the right.

The

The external air finds admiſſion into the lungs by the wind-pipe, called trachea or aſpera arteria, the head or upper part of which, called larynx, opens into the mouth at the throat; its opening is called glottis. It is compoſed of different cartilages firmly faſtened together, which are furniſhed with proper muſcles, chiefly ſubſervient to the purpoſes of the voice, and likewiſe inſtrumental in ſwallowing.

The aſpera arteria or trachea is continued from the larynx, and proceeds down towards the lungs. It is a firm tube, made up of cartaliginous rings, joined together by muſcular fibres. Theſe rings are incomplete ; probably that it may yield ſomewhat to the aliments diſtending the oeſophagus in ſwallowing, that lying immediately behind the larynx, or nearly ſo. The whole is covered on the outſide with a cel-

lular

lular membrane; and lined on the inſide with a ſmooth poliſhed one.

It deſcends entire into the thorax, as far as nigh the baſis of the heart; and there divides into two great branches, the one right, the other left; which again are divided and ſubdivided into leſſer and leſſer ramifications; and ſo diſtributed through all the ſubſtance of the lungs, terminating at length in ſmall membranous dilatable cells or veſicles.

The pulmonary artery, which we have had frequent occaſion of mentioning before ariſes from the right ventricle of the heart, proceeds towards the lungs, and, being divided and ſubdivided into branches gradually ſmaller and ſmaller, is diſtributed all over the ſubſtance of the lungs. Its ſmalleſt capillary branches become the origins of the

the pulmonary veins, which likewife run all over the lungs, accompanying their correfponding arteries; and at length form the great pulmonary vein; which opens into the left finus and auricle of the heart.

But befides thefe branches of the pulmonary artery that carry red blood, and tranfmit it to the veins to be fent back to the heart, it likewife fends off extremely fmall lateral ferous veffels, which open into the infide of the bronchia and veficles all along; and furnifh them with a moift extreme fubtle fluid, or rather vapour, which bedews their internal furfaces, hinders them from growing together, and preferves them fupple and dilatable. This appears from warm water, or even a fine injection's paffing from the pulmonary artery into the cavities of the bronchia. Kaw mentions his having often repeated this experiment with fuccefs.

The lungs, befides their external membrane, and cellular texture, are a congeries of air veffels and veffels which carry blood or juices derived from blood; and thefe two kinds of canals are fo uniformly difperfed through the lungs, that in every phyfical point there are branches of both all over.

Before we can explain the action of refpiration, we fhall give a fhort account of that fluid, which is alternately drawn into and expelled out of the lungs, and explain fome of its properties.

In the definitions we have mentioned fome of the general properties of atmofphe-

ric

ric air, that it is a tranſparent, elaſtic, ponderous, and compreſſible fluid.

It is elaſtic, that is, when compreſſed it endeavours to reſtore itſelf with a force proportionable, and nearly equal to the preſſure. From this property it is ſuſceptible of tremulous motions or vibrations; and is the medium of ſound.

It is heavy in a certain degree, being in proportion to water as 850 to 1, at a medium, for the weight of air varies, as appears from the phaenomena of the barometer; ſo that if a pint of water weighs a pound, a pint of air will weigh ſomething more than nine grains.

As it is an heavy fluid, it hath that property common to all ſuch fluids, that its parts are preſſed every way by the weight of the column above; and the force of that

preſſure

preſſure is in ſome meaſure in proportion to the altitude of the column. Hence it endeavours to recede from that preſſure, and actually does recede, if there is a vacuity to run into.

It is compreſſible by a ſuitable force into a leſſer ſpace than it poſſeſſes in the atmoſphere.

And therefore near the ſurface of the earth it is denſer and heavier than higher up, as the column of air preſſing there is higher. In this reſpect it is quite contrary to water, which is not compreſſible by any weight or force, as far as experiments have ſhewn. Water at the bottom of the ſea is no denſer than on the ſurface.

Air hath its ſpring or elaſticity increaſed by heat, and diminiſhed by cold, and therefore

fore heat uniformly rarefies it, as cold condenſes it; and this property ſeems to be unlimited.

If the preſſure of the atmoſphere is taken off a portion of air, it expands itſelf into a larger ſpace, and that property, likewiſe, ſeems to be unlimited; a cubic inch of air, when freed from the preſſure of the atmoſphere, will uniformly fill an indefinite ſpace.

Its elementary parts, when ſeparated from one another, and intimately mixed with other bodies, whether fluid or ſolid, exert no elaſticity, unleſs the atmoſphere is removed, or violent heat applied: or unleſs fermentation, putrefaction, or effervеſcence is produced, which ſets the aerial particles at liberty. But when joined together, by any of theſe means, they recover that property.

Theſe

Thefe are the chief properties of air, confidered as pure and unmixed with any thing foreign to its nature. But our air, the atmofphere we breathe in, is a chaos of every thing that is volatile, and light enough to be fufpended in it, and every thing that can be diffolved in it; and particularly, it is always more or lefs fraught with watery particles, as water expofed to the air hath always more or lefs air in it, which the air pump fhews. But ftill its fundamental qualities remain, its fluidity, weight, and elafticity or fpring; though the two latter are variable in their degrees, according to the various caufes that act upon it.

Let us then fuppofe the cavity of the thorax to be enlarged by the action of the intercoftal mufcles, which widen it by pulling the ribs forwards, and by the diaphragm, which, becoming plainer, and preffing back the

the viſcera of the abdomen, renders its cavity longer and deeper; in this caſe room will be made for air to be preſſed into the larynx, trachea, and lungs by the atmoſphere, to fill up the new ſpace with air of the ſame denſity with the ambient air. Of courſe it will ruſh in with ſo much the greater force, and in ſo much the greater quantity, the more the thorax is enlarged. This air ruſhing in will diſtend the membranous veſicles of the lungs, and fill them in ſuch a manner as to keep the external ſurface of the lungs always contiguous to the pleura; for there is no air between the pleura and the external membrane of the lungs; if there were, the lungs conld not play, as the air ſo included would counterbalance the external preſſure of the atmoſphere.

By this expanſion of the veſicles of the

lungs,

lungs, the capillary terminations of the pulmonary artery, and the beginnings of the pulmonary vein; which run along theſe veſicles all over the ſubſtance of the lungs, are unfolded and ſtreightened, which leſſens reſiſtance to the right ventricle of the heart, in propelling the blood through them into the pulmonary vein and left auricle of the heart.

At the ſame time the air drawn into the lungs is conſiderably colder than the blood in any part of the body, and particularly that of the lungs, where its velocity is very great, as alſo the friction; and in caſes of laborious and violent exerciſe, it prevents the heat there from being exceſſive. But beſide this refreſhing coolneſs of the external air communicated to the lungs; it would appear that it anſwers ſome other very

very important purpofes to animal life. As no animal that is furnifhed with lungs, as thofe of the more perfect kind are, can live any fpace of time worth mentioning, without conftant fupplies from this vital fluid, which feems, by an inftantaneous procefs performed in the lungs, to give off fomething falutary to life, and carry out of them fomething noxious, as the air thrown out from the lungs is rendered unfit for being again infpired, either by the fame animal or by another; but the qualities of this vital principle we fhall have occafion to fpeak of more fully when we come to treat of the properties of the blood.

Thefe are fome of the effects of infpiration, or drawing air into the lungs; let us now confider exfpiration, or the expulfion of air out of them.

When there is as much air taken in as the well being of the animal requires, the action of the mufcles that widen the thorax is discontinued; the cartilages of the ribs, which in infpiration were agitated, by being pulled forwards, are now at liberty to reftore themfelves by their elafticity, and pull back the ribs.

At the fame time the mufcular fibres of the bronchia, that connect the cartilaginous rings, being now at freedom to act; by their action they pull the rings clofer to one another, and thereby diminifh the volume of the lungs all over.

Befides, in a natural ftate as has been already obferved, there never is, nor can be, any elaftic air between the outer furface of the lungs and the pleura, as hath

appeared

appeared from undoubted experiments; hence the preffure of the atmofphere will co-operate with, and affift in thrufting down, the ribs.

But this is not all. For the mufcles of the abdomen, all more or lefs, concur towards exfpiration, in diminifhing the cavity of the abdomen, and preffing its vifcera upwards againft the diaphragm, by pufhing it higher up into the thorax, and fhortening its cavity.

The immediate effect of exfpiration is by diminifhing the volume of the lungs to force the blood through the capillary terminations of the pulmonary artery, and the venous fyftem correfponding with them, into the left auricle of the heart.

The current of the blood through the pulmonary artery, and the femilunar valves at its mouth, hinder it from being preffed back into the right ventricle; and determine its progrefs entirely towards the left auricle.

Hence therefore the alternate diftention and collapfing of the lungs becomes neceffary to expedite, and even to effect, the circulation of the blood through them.

Were it not for this alternate change of the lungs, the circulation of the blood in the human body, and all other animals that have lungs, and two ventricles to their hearts, could not be carried on.

For, if the lungs continued in a ftate of diftention by the air's being pent up within them, that air would be heated and rarified;

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its ſpring would be increaſed to ſuch a degree, that the ſmall blood veſſels, running along the membranous and veſicular texture in the lungs, would be ſo compreſſed by it, as to ſtop all paſſages through them; and life, which conſiſts in the circulation of the blood, would quickly be at an end.

On the other hand, if the lungs remained in a collapſed ſtate, without being diſtended by air inſpired, the ſmall veſſels would be folded together like threads in a clue; ſo that the right ventricle could not force the blood through them ſo expeditiouſly as that one pulſe ſhould regularly ſucceed another. The blood would quickly ſtagnate in the right ſinus, auricle and ventricle, and death enſue.

Therefore as ſoon as there is by inſpiration air enough admitted to anſwer the purpoſe of the trajection of the blood through the lungs, the animal for ſelf-preſervation, and to avoid uneaſineſs, drops inſpiratory efforts, and commences thoſe of exſpiration; and when it hath performed them in a proper degree, it again inſpires and expires and this action continues while life remains.

One of the general uſes of reſpiration is to effect the trajection of the blood through the lungs, and ſo complete the circulation, in which life conſiſts. For without it, as we have ſhewn, this trajection could not take place in animals that have lungs, after they have breathed and uſed them ſome little time. Foetuſes, that are pent up within the uterus, live under another kind of circulation, which we ſhall explain in its place.

By

By this trajection of the blood through the minute veſſels of the lungs, with ſuch velocity as it muſt there have, ſanguification is performed, the blood is comminuted and divided; its globules are compacted, condenſed, and rounded; and ſo rendered the fitter for flowing commodiouſly through the other canals of the body, for yielding the neceſſary ſecretions, and anſwering the numerous purpoſes of the animal economy.

Another very important uſe of reſpiration is, that by inſpiring of air into the lungs, heat is generated in the animal body, the redneſs of the blood is brought on; the chyle before it is mixed with the blood, is white, and the lymph is pellucid; but the maſs of blood after it hath paſt the lungs is red. It would ſeem, from Sir Iſaac Newton's diſcoveries concerning colours, that the change of colour here is owing to the

increaſe

increaſe of denſity. No doubt, beſides reſpiration, the circulation of the blood through the minute extremities of the arteries contributes ſomewhat towards this increaſe, and therefore enhances the red colour of the blood.

To bring about theſe ends, all the blood of the body is propelled through the lungs; which cannot be truly ſaid of any other viſcus of the body.

And in the ſame time that any quantity of blood hath circulated from the mouth of the aorta through its capillary branches, in the extremities, &c. and returned to the heart, an equal quantity of blood hath paſſed through the lungs.

Beſides the general and chief uſes of reſpiration already mentioned, nature always brings

brings about the moſt numerous and moſt important purpoſes by the feweſt and moſt ſimple means poſſible, that function hath ſeveral other uſes which are of the greateſt conſequence in the animal oeconomy.

The ſecondary uſes of reſpiration and exſpiration are many; by the latter we find that it exhales, as an emunctory, parts redundant or even noxious from the blood, which would ſuffocate if they remained; hence the breath of many people, ſhut up in a cloſe place, impregnates the air with a ſuffocating quality. On the other hand, it abſorbs from the air that vital oxygenous principle ſo neceſſary to life. It is by this volume of air, taken into the lungs, that the abdomen and all its viſcera are continually compreſſed and agitated by it, likewiſe the ſtomach, inteſtines, receptacle of the chyle, bladder, rectum, and even the womb, diſcharge their contents; by its action and alternate compreſſure on the ſtomach, digeſtion is forwarded and the blood urged through the ſluggiſh veſſels of the liver, ſpleen, and meſentery. It excites a kind of flux and reflux in the blood, by which it is alternately preſſed towards the extremities of the veins, and afterwards propelled towards the heart with an accelerated velocity. Inſpiration ſerves to convey odours along with the air to the organs of ſmelling ; by it likewiſe, animals diſtinguiſh their proper food, in ſelecting what is ſalutary, and rejecting what is noxious ; by it likewiſe, ſucking, ſo neceſſary to the new born animal, is performed.

Reſpiration forms the voice in every claſs of animals, and is of a particular kind or modulation, peculiar to each ſpecies, depending upon the difference of the larynx and glottis. This is demonſtrated from the

narrow

narrow glottis of birds, and the large broad glottis in hoarſe animals and ſuch as bellow or bleat. Every ſpecies have their own peculiar ſound or tone of voice. Thus the horſe neighs; the bull bellows; the ſheep bleats; and the dog barks; man only can articulate by voice and ſpeech, by drawing in and throwing air out of the glottis, formed and modified by the lips, tongue, teeth, and throat, in ſuch a manner as to produce an infinite variety of diſtinct ſounds, by which he is enabled to communicate his thoughts to another, and to repreſent theſe ſounds by letters and words.

Before we diſmiſs this function, let us obſerve that we may diſtinguiſh two kinds of reſpiration; the one eaſy and equal, which goes on without our attention, and while we are aſleep; this may be called vital or involuntary reſpiration; and the o-

ther

ther the voluntary kind, which we can influence by the will; and either excite or ſtop, and make quicker or ſlower, fuller or ſmaller inſpirations and exſpirations.

The former ſeems to be influenced chiefly by the diaphragm, and intercoſtal muſcles, and by a gentle proportionable action of the abdominal muſcles in expiration, co-operating with the elaſticity of the cartilages of the ribs, and the muſcular fibres that faſten together the cartilaginous rings of the trachea and its diviſions, called bronchia.

In great, full, and laborious reſpiration, there are ſeveral other muſcles beſides thoſe already mentioned, that are called into action, not neceſſary at preſent to particularize.

Laſtly, we may remark that there is a certain proportion of the frequency of acts of of refpiration, to the pulfe, there being in a common natural way about three or four pulfes for one refpiration. Hence refpiration is quickened, as the pulfe is quickened, either by exercife or in fevers. And therefore refpiration ought to be diligently obferved in acute diftempers.

CHAP.

CHAP. VI.

OF VOICE, AND SOME DISEASES OF THE THORAX AND LUNGS.

IN our laſt chapter, we have explained reſpiration, and ſhown that in an animal that is furniſhed with lungs, and hath uſed them even a very moderate time, the blood cannot be propelled by the heart through the lungs, without its aſſiſtance. That by inſpiration the blood in its paſſage through the lungs, hath its particles divided and

and comminuted; made denſer and more compact; rounded, and rendered red; and in general better fitted to paſs through the various ſizes of canals in the body, and furniſh matters for the various ſecretions. That the heat of the animal body is in a great meaſure generated from the air inſpired into the lungs, by which the blood is oxygi-nated; and, laſtly, that beſides theſe principal uſes of reſpiration, it likewiſe ſerves to bring about ſeveral other purpoſes, which are indiſpenſibly requiſite in the animal oeconomy. We ſhall now briefly explain ſome of theſe, that have the moſt immediate connection with reſpiration: and afterwards touch upon ſome of the principal diſtempers that have their ſeats in the lungs and thorax.

We ſhall begin with the voice, which in brutes is inarticulate, or a ſound produced by throwing out air with a certain

force

force or velocity through the glottis, or aperture of the larynx, ſo as to make the cartilages, of which the larynx is compoſed, to tremble and vibrate, and communicate the like tremulous motion to the contiguous air.

Coughing is produced by repeated quick inſpirations, each of which is ſucceeded by as quick, forcible, hard exſpirations, cauſed by violent ſtrokes of the abdominal muſcles determined upon the lungs. It is created by whatever irritates the pulmonic ſyſtem, from the head of the larynx to the bottom of the lungs. Its effect, as a natural action, is to throw off as it were, and clear the inſide of the bronchiae, by the violent impulſe of air through them, and ſhake off the irritating cauſe.

Sternutation,

Sternutation, ſneezing, or ſnorting, is produced by firſt drawing in a large quantity of air into the lungs, ſucceeded by a violent convulſive action of all thoſe muſcles together, that can in any degree contribute towards exſpiration; by which means the air drawn in immediately before in large quantity is driven with a forcible exploſion through the paſſage of the noſe. Its cauſe proceeds from whatever irritates the olfactory nerves ſpread upon the Schneiderian or pituitary membrane; its uſe is to ſhake and throw off the irritating cauſe, as wind blows off duſt.

We now proceed, according to the plan we propoſed, to give an account of ſome of the principal diſtempers that affect the lungs and aſpera arteria; and thereby exemplify the uſefulneſs of the knowledge of the animal oeconomy in the rational practice of phyſic.

We have already mentioned and explained coughing as a natural action, we ſhall now conſider it as a morbid ſymptom.

Coughing, as we have ſaid, is an effort of nature to ſhake off ſomething that is troubleſome to the pulmonic ſyſtem in a healthy ſtate. Though this effort tends in its own nature to a ſalutary purpoſe, yet when it tends to a morbid or diſeaſed appearance, no time is to be loſt in uſing the moſt effectual means of removing it, as we ſhall ſee hereafter the danger of trifling in ſuch caſes.

The moſt frequent cauſe of coughing is what is commonly called catching of cold, or a catarrh. The ſeat of this diſeaſe is in the pituitary or the Schneiderian membrane, ſo called from Schneider, a learned German phyſician, who firſt conſidered it at large, and its diſeaſes. This membrane lines the cavity of the

the nofe, the palate and throat; paffes into the cavity of the larynx and afpera arteria, and lines the infide of the whole fyftem of air veffels in the lungs; and in like manner the infide of the oefophagus, ftomach, and inteftinal tube. Its furface hath, (befides vifible mucous, excretory ducts, fcattered up and down) fmall evanefcent ferous arteries opening upon it, which convey a warm watery moifture, which in health is in the form of a vapour, and keeps it moift and flippery, and hinders its contiguous portions from growing together; and as this vapour is liable to be accumulated, there are in the fame furface abforbent venous veffels to take it up. But when by the cold air the abforbent veffels are conftricted, and the vaporous fluid condenfed, the exhaling arterial canals continuing to pour out their liquids, inftead of a warm vapour, that creates no irritation upon the parts, a fenfible falt ichorous lymph is difcharged

from

from the various affected parts of the membrane, which irritates wherever it trickles along; if it falls upon the noftrils, it creates fneezing, or fnorting; and if it fall upon any portion of the pulmonic fyftem, from the head of the larynx to the bottom of the lungs, it creates coughing; and, obftinately continuing, too often lays the foundation of a phythyfis pulmonalis.

The cure of this cough, while it is recent, and the lungs are yet entire and unimpaired, befides keeping warm, reft of body, low foft diet, with plenty of diluting drink, made milk warm, to encourage a diaphorefis, it requires balfamic, fmooth, demulcent medicines, and a prudent ufe of opiates; by the application of which, after the diftemper hath in fome meafure had its courfe, the obftructions in the membrane being opened, the catarrh or defluxion is drained

drained up; and the irritating cauſe removed.

Another very common cauſe of coughing is an accumulation of tough phlegm in the bronchiae. As we have obſerved, there is naturally a warm moiſt vapour poured by ſmall ſerous arteries into the cavities of the bronchiae; if this is poured out in too great a quantity, by remaining there, it becomes thickened, the thinner and aqueous part either flying off into the air, or being reabſorbed, the remainder becomes viſcid, clogs up the paſſage, irritates the lungs, and excites a cough, which is an effort to get rid of it. This cough is cured or relieved by ſuch medicines as attenuate the impacted phlegm, lubricate the paſſages, temper acrimony, and leave a balſamic aſtringent effect, preventing the accumulation of too great a quantity of phlegm for the future; and

and ſuch medicines as poſſeſs one or more of theſe powers in a remarkable degree are called pectorals.

Some pectorals have chiefly a faculty of tempering acrimony, and lubricating the paſſages, as ſpermaceti; all expreſſed oils, and oily ſubſtances. Others chiefly attenuate, diſſolve, and deterge phlegm; as liquorice and other pectoral plants, ſugar, honey, vinegar, gum ammoniac, &c. others are beſides aſtringent and balſamic; as all the terebinthinate claſs, and their preparations.

Opiates become pectorals chiefly, and almoſt ſolely, by taking off the ſenſe of irritation for a ſhort time, but without carrying off the irritating cauſe; howeverthey are of great uſe, by keeping down the violence of of cough, and procuring a truce, until the caufe be removed by other effectual methods.

Afthma is a difficulty of breathing, with wheezing, returning by fits, and often laft-ing long, and threatning fuffocation. In horfes it is called broken wind, requiring a double effort or two exfpirations to empty the lungs for one infpiration, attended with violent heaving at the flanks.

Authors have diftinguifhed afthma into the nervous and humoral, to denote that every fpecies of afthma leans to one of thefe two kinds, as they are feldom or never to be met with pure and unmixed.

The humoral kind, is that which is oc-cafioned by an accumulation of phlegm or mucus in the fmall and deep bronchiae; which, when it is in a great quantity, and occupies a large portion of them, hinders the air from expanding the lungs fufficiently, ſufficiently, and expediting the paſſage of the blood through them.

The nervous or dry cough, ſometimes termed convulſive aſthma, is created by a convulſive conſtriction of the muſcular fibres that connect the cartilaginous rings of the bronchiae, which makes the lungs to reſiſt their being expanded by the air. But, at the ſame time, a ſpaſmodic diſpoſition in the muſcles of the abdomen, overpowering the diaphragm, may be an acceſſary, or perhaps in ſome caſes a principal, cauſe of this ſort of aſthma.

But if the aſthma is of any remarkable violence, or continuance, it is ſeldom or never without a mixture of both natures. An aſthma from a nervous cauſe, of any conſequence, can ſcarce fail of accumulating more phlegm than there ſhould be, by pen-

ning

ning it up, and hindering the ſalutary efforts of the lungs in order to throw it off. And where there is a great quantity of phlegm, ſo as chiefly to produce real aſthmatic fits, there appears always, as far as we have obſerved, ſigns of a ſpaſmodic diſpoſition, and conſtriction of the lungs.

In the humoral kind, beſides a prudent meaſure of proper evacuation, the moſt effectual and attenuating pectorals are indicated. Pectoral vegetables, the ſpirit of Mindererus, gum ammoniacum, ſquills, and, in violent caſes, antimonials and mercurials are moſt to be depended upon.

In the nervous aſthma, cephalic medicines are required; but not without the mixture of attenuants. The fetid gums act here in a double capacity. Bliſters pretty extenſively laid on the ſides operate moſt effectually and are very proper in all obſtinate coughs.

Haemoptoe, is a throwing up of blood ; if it comes not from the mouth or throat, but is brought up from the breaſt, with a kind of ſhort cough, in a remarkable quantity, and frothy appearance, proceeds from a breach of ſome of the branches of the pulmonary artery.

A breach of veſſels in the lungs is of more dangerous conſequence than in many other parts of the body, becauſe of their inceſſant motion, the velocity of the blood paſſing through them, and the ſpongineſs of their texture. Upon theſe accounts it is apt to degenerate into an ulcer. Great care therefore is to be taken to treat it properly when it firſt appears, that the breach may be healed as ſoon as poſſible. Bleeding, gentle

gentle cooling phyfic, cooling temperate diet, reft of body, with opiates, and fuch balfamic pectorals as can beft keep the cough under, are here requifite. If the haemorrhage is large, aftringents and even ftiptics are neceffary, of which alum is none of the leaft effectual.

A vomica pulmonum, is a tumor bred in the cellular texture of the lungs; which contains fometimes pus, fometimes a vifcid liquor different from pus, and fometimes a clear pellucid lymph. This laft fort is called hydatid. The vomica grows larger and larger by degrees, and creates more and more of irritation, by preffing the contiguous air veffels againft one another, which excites an almoft perpetual cough, and lays the foundation of a phythifis pulmonalis.

If it burſts, it becomes an open ulcer. And if the matter is kindly, the habit of body good, the tumor circumſcribed, and its coats but thin, it ſometimes cleanſes, and heals ſpeedily ; but too often the ulcer continues to increaſe and ſpread ; the patient coughs almoſt inceſſantly, and throws up much fetid ſtuff, both by the mouth and noſtrils, the lungs waſte, and are conſumed, attended with an hectic fever.

I have known a broken rib, in conſequence of the horſe falling on a looſe ſtone, occaſion a vomica in the lungs ; much purulent matter was thrown up by the mouth and noſe, but the real cauſe of the diſorder was not diſcovered till on diſſection, the rib was found bent inwards, had tore the lungs, inflammation followed, and of courſe ſuppuration, which ſuffocated the patient.

A vomica in the lungs from catarrh, &c. is for the moſt part incurable, but in the caſe of a broken rib as above, when all the circumſtances are early known, ſomething may be done by way of prevention, to preſerve the life of the animal, and render him afterwards uſeful; by obſerving the ſame treatment as in inflammation of the lungs, and afterwards adminiſtering ſuch balſamic pectoral medicines as are ſafely detergent. Theſe with a prudent uſe of opiates, proper diet, and reſt of body, are the chief means to effect a cure, where it can be effected.

An ulcer of the lungs, as hath been hinted, may proceed from a throwing up of blood, without a previous tumor, and goes on pretty much in the ſame courſe we have been now deſcribing; requiring the ſame method of cure and regimen.

Inflammation of the lungs.—This is one of the moſt frequent and moſt dangerous diſeaſes to which our patients are liable, and requires the greateſt prudence, ſkill, and attention in the veterinary practitioner, to regulate his conduct in the management of it, ſo as to preſerve the life of his patient, or the future ſoundneſs of this organ. As all inflammatory diſorders in horſes are exceedingly rapid in their progreſs, and if not properly managed ſoon terminate in gangrene and mortification, of courſe the loſs of the patient in the ſhort ſpace of two or three days.

We have already explained the different functions of this organ, its great vaſcularity, the great maſs of blood it muſt of neceſſity contain, at all times, even in health; from which we may infer, that any undue accumulation of blood in this viſcus, any hindrance or obſtruction to its free circulation,

or

or any impediment to its natural functions, will derange the whole circulating syftem. The right ventricle of the heart will be furcharged with blood, which it cannot propel through the lungs, while at the fame time the left ventricle cannot receive a fufficient quantity of blood from the lungs to fupply its contracting and propelling through the body; hence a fmall contracted and oppreff-ed pulfe; the air is prevented from paffing fully in and out of the lungs, and hence likewife a laborious breathing.

Symptoms of this diforder are numerous, as in fever of the fymptomatic kind, a fmall and frequent pulfe, laborious breathing with wide and extended noftrils, heaving at the flanks, mouth hot and dry; hot breath, extremities cold, the tongue white, membrane on the infide of the nofe red, eyes red and heavy, veins about the head turged and full, the patient difpofed to cough,

cough, but unable to make the effort from pain, the horſe ſtands ſtradling and extended on his legs, panting for breath, ſeldom or never lies down; dullneſs and heavineſs about the head; cold ears; the natural ſecretions of dung and urine generally not much affected, but in ſome caſes a diſpoſition to coſtiveneſs. As the diſorder proceeds, a gleeting from the noſtrils of a greeniſh ſlimy mucus, with a foetid ſtinking breath, the air around him becomes tainted with a cadaverous ſmell. Unable any longer to ſt uggle with the diſorder, he falls ſuddenly down and expires. On diſſecting the bodies of ſuch patients as have died of this diſorder, the lungs are generally found turgid and full of blood, of a black appearance, and in a gangrenous ſtate; the texture of this organ being diſtroyed, it cannot bear the touch, but appears as if it were rotten; hence this diſorder has among farriers and others got the name of the *rot*;

and

and has been as erroneoufly applied to fimilar difeafes of other domeftic animals.

The caufe of this difeafe is generally too fudden expofure of the body to cold, in any fhape, after being overheated, either from exercife or from the habit of being conftantly covered with body cloaths in too warm a ftable; for horfes feldom fuffer any injury from cold when their bodies are expofed to it in a temperate ftate; this we know from experience, in a variety of cafes, but more efpecially when horfes are turned out to grafs at all feafons.

The method or indications of cure to be obferved, on the very firft attack of this diforder, for not one moment of time is to be loft, are a ftrict attention to the antiphlogiftic regimen, in leffening the diftention of the blood veffels in the lungs, by plentiful bleeding, according to the age, ftrength, and ſize of the patient. If the pulſe riſes after the firſt bleeding, it ought to be repeated at intervals afterwards, but to a leſs extent, always having regard to the age, ſize, and ſtrength of the patient, till the violence of the ſymptoms abate. Emollient glyſters are of great uſe ; together with ſtrong bliſters, or other irritating liquid mixtures pretty extenſively applied to the breaſt and ſides of the thorax or cheſt. When the violence of the ſymptoms abate, iſſues or rowels may be put under the breaſt, on the moſt depending parts, beſmeared with ſtimulating ointment. But no liquid drenches, or perhaps no medicine whatever, ſhould be attempted to be given by the mouth during the violence of this diſorder, as the very attempt, and poſition to which the head muſt be raiſed, aggravates the diſorder and endangers ſuffocation ; inſtances of which have occurred too frequently, and haſtened a fatal termination.

The

The patient ought to be kept cool both with refpect to clothing and the heat of the ftable. Thin water gruel for drink may be offered frequently, rather cool than otherwife, but no folid food whatever, till the violent fymptoms are removed, when thin mafhes are the moft proper food for a few days. With refpect to medicine, diuretics are here of great ufe, as this difeafe frequently terminates in a ferous effufion of the watery parts of the blood, into the cavity of the thorax, and lays the foundation of a hydro-thorax or a dropfy in the cavity of the cheft.

Pleurify,—Is an inflammation of the pleura, or that membrane which lines the cavity of the thorax. Some Phyfiologifts place the feat of this difeafe in the external membranous coat of the lungs. But the fymptoms, which take place on the firft

attack

attack of a pleurify, differ very confiderably from thofe that appear on inflammation of the lungs, both in man and in horfes. The violent pains or ftitches felt in the fides in the human patient, and the feeming acute pains affecting horfes in the like diforder, and in the fame place, feem to indicate, that the real feat of the difeafe is primarily in the pleura, although in its progrefs the lungs may likewife become affected.

On the firft attack of the pleurify, the horfe appears rather lively; the pulfe quick and hard; fever high; dry fhort tickling cough; breathing quick and fhort; great reftleffnefs; feeming fharp pains in the fides, as the head is frequently turned to that which is affected; mouth dry; extremities hot; fometimes profufe thin fweat on the fides and temples; the horfe lies frequently

quently down, but gets up inftantly, not being able to breath in that pofture ; paws the ground frequently with his fore-feet ; fhifts from fide to fide of the ftall ; the natural fecretions of dung and urine free. In the courfe of a few hours (if not relieved,) the fymptoms vary ; the reftleffnefs goes off ; the fever increafing ; looks dull and heavy ; pulfe throbbing and quick ; difpofition to cough but unable ; panting and fhort ftops in breathing, intermixed with groans; extremities become cold ; damp clammy fweats ; inattention to what paffes around ; ftraddling fixed pofture till he drops down.

Upon diffecting horfes that have died of a pleurify, the intercoftal mufcles to a great extent have been found greatly affected and in a gangrenous ftate.

The

The caufe of pluerify generally proceeds from cold in any way applied to the body when in an overheated ftate, or too fudden-ly after it. And the diforders arifing from catching cold in our patients are frequent-ly far advanced before they attract notice, fo as to admit of being checked in their firft beginning.

The mode of cure in pleurify ought to be the fame as that formerly mentioned in the cafe of inflammation of the lungs. We have been the more minute in defcribing the fymptoms of pleurify to enable the young veterinarian to diftinguifh it from flatulent cholic, as in the latter complaint, fome of the fymptoms attendant on pleurify are nearly fimilar. In the cholic, the horfe paws the ground with his fore-feet, turns his head frequently towards his belly, as if to point out the feat of his complaint, at the

fame

ſame time he frequently ſtrikes his belly with his hind feet, but never attempts it in a pleuriſy.

Hydrothorax, or dropſy in the breaſt,—Is, as we have obſerved, a ſerous effuſion of the watery parts of the blood, collected into one or both ſides of the cavity of the thorax, generally the conſequence of a prior inflammation. As this diſeaſe is ſometimes ſlow in its progreſs, gradually and imperceptibly encreaſing for ſome time after the inflammation is gone, it may be ſaid to be of the chronic kind, but with ſome exceptions.

The ſymptoms of this diſeaſe, when of ſome ſtanding, beſide all the attendants and morbid exterior appearances of ill health and want of appetite, are a great difficulty in breathing; a gleeting of ſlimy

mucus

mucus from one or both noſtrifts, a feeble irregular pulſe, a ſenſible fluctuation of water in the cheſt, clamminefs in the mouth, a ſpare diſcharge of urine, faeces black, ſoft, and ſlimy.

The cauſe of this diſeaſe, we have formerly obſerved, generally proceeds from a prior inflammation of ſome of the viſcera in the thorax, and the ſucceeding debility that takes place afterwards. The exhaling veſſels become relaxed; and, continue to pour out more fluids than the abſorbents can take up; hence it is accumulated; and in the laſt ſtage of the diſeaſe, the lungs are literally drowned in water, of courſe the patient is ſuffocated. A number of caſes of this kind occurred here among the cavalry horſes in ſpring and ſummer 1799, which confirmed this obſervation on diſſection.

We

We have thus given the hiſtory, the cauſe, the ſymptoms, and the appearances on diſſection of a hydro-thorax, but any attempts towards a cure muſt be left to future experiments to aſcertain its practicability in horſes. Although the very nature of the caſe, together with the conſtant prone poſition of the body, in ſome degree points out the means that may be tried towards effecting a cure by a ſurgical operation called tapping, which is by perforating with a trochar between the ribs, on the thinneſt and moſt depending part of the thorax, into its cavity, to diſcharge the contained water. To promote the ſucceſs of this operation, we would recommend, before introducing the trochar, that the outward ſkin, after a perpendicular ſlit is made in it, be drawn well to one ſide, that upon retracting, it may ſerve to cover the perforation made by the trochar, in order to keep out as much as poſſible the external air from getting in between the pleura and the lungs. If the patient, after this operation, feems relieved, and likely to live, fuch medicines may then be adminiftered as ftimulate, and increafe the powers of the abforbent veffels, and diminifh the difcharge of ferum from the exhaling veffels.

Perhaps it might be advifeable, after placing the horfe in a proper pofition on his back, to inject into the cavity of the thorax fome gently ftimulant or aftringent liquor, fuch as lime water or brandy diluted with water, as is fometimes practifed in fuch cafes in the human fubject.

CHAP.

CHAP. VII.

OF THE NATURE AND PROPERTIES OF THE BLOOD.

IN the preceding chapters, we have treated on the motion or circulation of the blood, and on reſpiration, without which, in a born animal, its paſſage through the lungs could not be effected; we ſhall now examine into and explain the nature and properties of the blood itſelf, out of which the various ſecretions are made, and the various

various liquors anſwering the numerous purpoſes of the animal oeconomy are drawn,

Blood is the life of the animal. It is a fluid of a very particular nature, although at the ſame time there is no eſſential difference between the blood of a man and that of a brute; both poſſeſs the ſame properties of preſerving life, and perhaps, by transfuſion, the blood of one animal might ſerve to ſupport life in another. However, there is one thing we are certain of, and which is, by drawing or taking away the blood we weaken the ſyſtem. In general, the animal becomes faint; and, if puſhed to the extreme, he dies from the loſs of this vital fluid. The body then haſtens to diſſolution and ſeparation of its parts.

We ſhall firſt conſider the blood, as it appears to our unaſſiſted ſenſes, little, if at all,

all, changed by art; next we ſhall deliver what is diſcovered concerning it by microſcopes; and, laſtly, enumerate the different ſubſtances it yields when chemically analyſed.

Blood, drawn from an animal in health, and received into a veſſel, appears firſt an homogeneous fluid, uniformly red, and remarkably thicker than water.

While it remains warm, it throws off a vaporous ſteam, of a ſmell betwixt that of ſweat and urine. This vapour, if collected in veſſels for that purpoſe, when condenſed by cooling, is found to be a limpid water, lightly impregnated with native animal oil and ſalt, inclining to an alcaline nature.

As the maſs cools, it gradually thickens into a gelatinous conſiſtence. Its ſurface, expoſed expofed to the air, is of a lighter and more florid red than the fubftance within, and at the bottom, which is darker and inclining to black.

This coagulum, confifting of the whole of the blood except the vaporous fteam we have mentioned, is found to be fpecifically heavier than water by about a twentieth part.

The longer this coagulum ftands in a place no warmer than the furrounding air, the more it is changed. It parts with a thin yellowifh fluid called its ferum, (like the whey of milk feparating from the curd, from which refemblance probably it hath its name.) This ferum is heavier than water by more than a fortieth part.

The red part, called cruor or craffamentum, and fometimes, but improperly, its fibrous

brous part, as there are no fibres naturally in the blood, is confiderably heavier than the ferum, and therefore always fettles at the bottom of the difh.

This red part, or craffamentum, if dried by art or chance, before it is melted down into ferum, or diffipated by putrefaction, becomes hard and brittle, and entirely inflammable, and therefore oil is the chief part in its compofition next to water.

The whole blood, both ferum and craffamentum if it ftands long enough in a warm place, putrifies and flies off in fetid effluvia, leaving very little faeces.

The ferum, and likewife the craffamentum, by a degree of heat fomewhat lefs than that of boiling water, is coagulated like the white of an egg. They are likewife

coagulated

coagulated by alcohol, and ftrong mineral acids.

They both leave a flight faltifh tafte upon the palate, fhewing fome kind of falt to be an ingredient in the compofition of the blood.

Thefe are the principal and moft obvious phenomena of the blood, when examined by the unaffifted fenfes, and with little or no artificial apparatus.

By the microfcope more of its nature and conftituent parts is difcovered. From a fmall wound made by a fharp inftrument in the finger, let a drop of blood be received into a fmall glafs tube, and examined with a good microfcope, it appears not homogeneous, but confifting of red globules fwiming in a pellucid liquor.

By

Or by applying the microſcope, while the blood is moving in the veins of a warm living animal, as in a chicken, or a cold animal, as in that of a frog, we perceive the red globules already mentioned following one another in alternate ſucceſſion in the courſe of the circulation.

On analyſing the blood, it is found to contain fire, air, water, earth, iron, and ſalt.

That the blood contains fire, in a latent ſtate, is evident from its heat; which, in the human body, and that of ſome other animals, is from 90 to 100 degrees of Farenheit's thermometer. The principle of heat, in chemical language, is termed *caloric*. This principle the blood acquires from the air in its paſſage through the lungs, as will be more fully explained hereafter.

The blood likewife contains air in an unelaftic ftate, and that in a very confiderable quantity; this appears from its putrefaction, and from diftillation.

Water forms another part of its compofition; for, from frefh drawn blood diftilled with a flow heat, a quantity of water, equal to 5 parts in 6, may be obtained.

The blood contains earth; this is demonftrated from nutrition and from chemical analyfis; it appears that this earth lodges in the moft fluid and oily parts of the blood.

The blood contains a ferruginous earth or iron, which is attracted by the loadftone, and is found upon calcination to be reducible into metal. It is from this iron that the blood is fuppofed to derive its red colour.

Salt

Salt in the blood we perceive from its taſte.

From the preceding analyſis of the blood, it evidently contains a great variety of particles, differing in bulk, weight, figure, and tenacity. Some watery, others inflammable, and moſt of them inclined to putrefaction, or to an alkaline nature; for the blood, as we have obſerved in a ſound healthy ſtate, is neither alkaline nor acid, but mild and gelatinous, and only ſaltiſh to the taſte. Yet, in ſome diſeaſes, it becomes acrid or ſharp, and approaches near to a ſtate of putrefaction; as in dropſy, where the waters have ſomewhat of an alkaline nature.

The greater the quantity of red globules in the blood, the ſtronger the animal is ſuppoſed to be. Hence ſtrong animals have very red muſcles, as they contain a greater quantity of red globules; weak mufcles are pale as they are deprived of them. Butchers are fenfible of this when they bleed their calves frequently before flaughtering, in order to take away the red globules from the mufcular parts, that the flefh may appear white.

Whatever increafes the rapidity of the circulation of the blood, whether from labour, violent exercife, fever, &c. will augment the cruor or craffamentum, together with the rednefs of the blood. On the other hand, inactivity and indolence, with low diet, the craffamentum will be proportionably leffened, and its ferum and mucus increafed. The craffamentum and gelatinous parts of the blood are greateft in the vigour of life, and diminifh as age advances. From too fevere and long continued exercifes, great heat of the furrounding atmofphere, and from malignant diforders, the cohefion cohesion of the blood is dissolved, and it assumes an alkaline quality.

The red globules in the blood being confined within the first order of vessels prevents them from collapsing, and, from the force of the heart and density of their parts, they may add to its impetus, and to the motion of the lesser order of humours. It is likewise probable that the heart is more strongly irritated by the ponderous cruor of the blood; the globular figure of its parts, together with their density containing a quantity of iron and oil, makes them easily pervade the vessels, and perhaps tends to increase its power of retaining and keeping up that heat it had acquired in the lungs. We know that gentle exercise, in a healthy state, increases the circulation, and produces a gentle warmth over the body. A partial friction or rubbing, on any part of the

body,

body, by promoting the circulation in the part, increafes the heat in them alfo.

When the red part or cruor of the blood is too much diminifhed by violent hemorrhagies, or too profufe and frequent bleedings, then follows a ftagnation or a leffened motion of the humours in the fmaller veffels, which difpofes the body to œdema and to dropfy. By the fame rule, a due proportion of cruor is neceffary in the habit to generate and repair new blood; for, from the defect of thefe, it lofes its red denfe nature, and degenerates into a pale ferous or watery ftate. Hence it is evident, that health, in a complete or more perfect animal, cannot fubfift without a denfe and red blood; for, if its quantity fhould be too much diminifhed, it caufes a ftagnation of the juices in the fmaller veffels, which is followed by a coldnefs and weaknefs in all parts of the body. Neither can life or health

health ſubſiſt without a ſufficiency of the thinner juices intermixed with the red blood, as the cruor, when deprived of its watery parts, is diſpoſed to congeal and obſtruct the ſmaller paſſages of the veſſels, and apt to engender too great a heat in the body.

But farther; as it is the cruor that has the red colour peculiar to itſelf, and which it gives to the other parts of the blood; if theſe parts were not kept fluid by the thinner juices, aided by the attrition of a vital circulation, or ſome ſimilar concuſſion, they could not paſs through the minute order of veſſels, of courſe would occaſion a ſtagnation; hence may proceed tumours and local ſwellings, &c.

We have ſeen that blood out of the veſſels runs into a confuſed, compact, tremul-

ous

ous mafs, like to the liver. The fame effect will be produced by the addition of alcohol or ardent fpirits, by mineral acids, or by a heat of 212 degrees, (which is that of boiling water,) 98 of which is the blood heat in thofe animals that are ftrong and robuft.

Blood, whether in a fluid or a folid ftate, is fpecifically heavier than water, by about an 11th part; and, when freed from its watery part, it is wholly inflammable. In a mafs of healthy blood, an half, or perhaps more, confifts of red cruor; and in ftrong animals the ferum makes only about a third part, and is ftill more diminifhed in fevers, often to a fourth or a fifth of the mafs.

There is a difference both in colour and quality between the blood in the arteries, and the blood in the veins. The former being of a bright florid red. The latter of a dark blackifh

blackifh red. The arterial blood contains thofe vital qualities it had acquired in the lungs, and which it gives out in the courfe of the circulation, for the different purpofes of the animal economy. The venal blood, on its return to the heart, takes up, and carries along with it, certain noxious qualities and impurities, which muft be thrown out in the lungs, in order to fit it for a new circulation; it is from thefe noxious qualities that the air, which is expelled from the lungs in expiration, is rendered unfit for breathing.

In the coagulum of the blood, there is a thin fluid, called its lymph, which is thought to be a moft effential part of the blood, as it has in the courfe of the circution become completely animalized; it is fuppofed to form the new organization of parts that have been deftroyed, as in wounds, &c. likewiſe the callous of bones. It forms nutrition in all parts of the body. The thinner parts ſerve various purpoſes, as the ſolution of the aliments; the moiſtening of the external ſurface of the body, and ſurfaces of the internal cavities, in order to preſerve the flexibility of the ſolids, and conduce to the functions of the nerves, the eyes, &c. the ſaline particles ſeem proper for diſſolving the aliment, and ſtimulating the veſſels. Moderate heat of the body contributes to the fluidity of the humours, and is not eaſily raiſed to that degree ſo as to coagulate them.

The quantity of blood contained in the body cannot be aſcertained with any degree of certainty. But it is ſuppoſed that the weight of the maſs of humours of various kinds, is greater than that of the ſolids; and if we may be allowed to form a judgement, from thoſe profuſe hemorrhagies that

that have been ſuſtained, without deſtroying life, both in men and in horſes, together with experiments made on living animals, by drawing out all their blood, joined with the bulk of the arteries and veins; the maſs of circulating humours in a man will be about 50 lib. of which the red blood may be calculated at 28 lib. Dr Bracken has calculated the quantity of blood in a horſe to be about ſix times more than in a man; but he calculates the quantity of blood in the latter to be only about 25 lib. which will make the quantity of blood in a horſe to be 150 lib. The quantities of blood that have been loſt from hemorrhagies, &c. in the human ſubject, and where the patient has ſurvived, is almoſt beyond belief. Haller mentions a caſe where 75 lib. was loſt in the ſpace of ten days; and, in another caſe, where 29 lib. was drawn away in four or five hours; and

and cafes have occurred in our practice where horfes have loft from 20 to 30 lib. in repeated bleedings, in the courfe of 12 hours, and that without injury, farther than a degree of weaknefs for a few weeks.

The feeming quantity of blood in individuals, both in men and in brutes, appears to vary in proportion, at different times, and varying in different parts of the body. Neither does it contain the fame or like proportions of thofe elements above mentioned; for an increafed celerity of the motion of the blood, whether by laborious exercifes, fever, &c. augments the craffamentum, together with its rednefs. The fame caufe likewife increafes the thicknefs of the ferum. From the above circumftances, together with the ftate of the folid fibres and veffels, the different temperaments of men and brutes are faid to be derived, and are diftinguifhed by the terms of plethoric or fanguine,

guine, which arifes from abundance of the red globules in the blood; the phlegmatic temperament from a redundancy of the watery parts in it. The choleric difpofition feems to arife from an acrid and alkalefcent difpofition of the blood, as appears from thofe men and brutes who live much on flefh. The former being more paffionate, and the latter more fierce than thofe who live on vegetable food. To the above may be added a kind of dull heavy fluggifh temperament, almoft bordering on ftupidity, attended with great bodily ftrength. Inferences may likewife be drawn from the folids, where a great firmnefs of the parts joined with an exquifite fenfibility, or what is called nervous irritability, difpofes to the choleric habit; lefs irritability, with a moderate denfity, to a plethoric or fanguine habit, and a ftill leffer degree of denfity and irritability to that of the phlegmatic temperament. Thus far with refpect to

the

the conſtitutional temperaments ; and thoſe who are much verſant in horſes, may eaſily draw a concluſion of their tempers and diſpoſitions, from the countenance, eyes, and motion of their ears, for horſes have their peculiarities of temper as well as men.

Dr William Harvey, who lived about the beginning of the 17th century, was the firſt who diſcovered, and, by experiment, proved the motion of the blood returning to the heart by the veins, in ſuch a manner as to render the whole intelligible, and to leave no room to doubt its reality ; for before this diſcovery, the veins were ſuppoſed as well as the arteries to be concerned in diſtributing the blood throughout the body. The arteries being always obſerved to be empty or nearly so for a long time after death, they were ſuppoſed to contain air only ; and from this circumſtance, they derive their name as air veſſels.

As

As the blood nouriſhes the whole body, and tends to the ſupport and growth of its parts, together with the various humours that are ſecreted from it, of courſe there muſt be a continual waſte, not only of its conſtituent parts already mentioned, but likewiſe of its quantity; theſe muſt be conſtantly renewed; the latter, by the food or aliment that is taken into the ſtomach; the former, renovated by the action of the air, &c. on the blood, in its paſſing through the lungs.

In the preceding chapter on Reſpiration, we had occaſion to make ſome remarks on the weight and elaſticity of the air, and the manner of its acting on the lungs in the acts of reſpiration and expiration; we are now to make ſome farther obſervations on the properties of its other conſtituent

parts,

parts, and their effects on the blood in its paſſage through that organ.

Atmoſpheric air, in which we breath, is compoſed of different parts,* ſome of which are diſtinguiſhed by different properties, viz. that of ſupporting reſpiration in animals, and combuſtion or burning in inflammable bodies. In 100 parts of atmoſpheric air, there are about 27 parts only that will ſupport reſpiration and combuſtion. Theſe 27 parts are termed vital or oxygen, the other 73 parts that are incapable of ſupporting the

* These being aerial fluids are termed gasses, and, for the sake of brevity, are distinguished in the new Chemical Nomenclature by short terms which are expressive of their qualities, as oxygen, for vital air, azot, for mephitic air, carbon, for fixed air, hydrogen, the principle which generates water, and caloric the principle of heat.

the above proceſſes are azot and carbon; according as these predominate in the air, it may be reckoned more or leſs pure.

But to illustrate this farther. If an animal be confined by a proper apparatus to breath in a certain portion of atmoſpheric air, it will breathe with freedom while the oxygen or vital portion of the air laſts; but when that is conſumed, its breathing will become more and more difficult, till at laſt it is ſuffocated. A body burned under the above reſtrictions abſorbs the vital principle, or oxygen, from the air; when that is conſumed, the burning ceaſes; the air that remains in both caſes is unfit for reſpiration or combuſtion. Oxygen air, collected by itself, and a lighted taper put into it, burns with ſuperior brilliancy. Animals breathe in it with freedom; and are active and lively. Azot, collected by itſelf, and a lighted taper put into it, is extinguiſhed immediately: animals, on drawing it in to their lungs, die inſtantly.

It has been already obſerved, that the venal blood, on its return to the lungs, carries along with it ſome noxious qualities from the conſtitution that requires to be diſcharged from it in that organ by expiration. Theſe noxious qualities meeting with the atmoſpheric air in the lungs, a chemical proceſs inſtantly takes place, conducted by certain laws in nature, by which theſe noxious qualities are attracted and thrown out by expiration. This expired air is no longer capable of ſuſtaining either life or flame; but, to be more particular in the above proceſs, the oxygen combining within the lungs with a quantity of carbon derived from the venal blood in the pulmonary arteries, by which carbonic acid is formed, and which is expired together

with

with the azotic gas. During refpiration a flow combuftion takes place in the air-cells in the lungs, by which the dark venal blood is deprived of its fuperabundant carbon, and reftored to the ftate of florid arterial blood, and rendered fit to circulate throughout the body. The hydrogen, from the venal blood combining with the infpired oxygen, forms a part of that humid vapour which iffues from the mouth and noftrils in breathing, which is more or lefs vifible, according to the ftate of the atmofphere. By the union of the carbon with the oxygen, a quantity of caloric is difengaged from the latter, and heat is produced: And to this fource, in a great meafure, is to be attributed the origin nd conftant fupply of animal heat.

From what has been faid, it would appear, that the blood acquires, from the air,

certain

certain properties, and, at the sametime, possesses, in itself, certain other properties by which its first principles are, as it were, brought back from a venal to an arterial state, which renders it fit for the support of animal life. The alteration produced by the air on the blood in the lungs, from a venal to an arterial state, has long been suspected; but by what means this change was effected was not known till the late improvements in chemistry opened a new field for experiments on atmospheric air, from which the above conclusions are formed; for when blood is drawn from a vein, it is of a dark colour, but, on being exposed to the air, it soon loses that dark tint, and acquires a bright florid red colour; and even when venal blood is put in a thin bladder, those parts of it, which are in contact with the external surface of the bladder nearest to the air, become of a brighter red colour than the internal parts of the same fame mafs. From experiments made on live animals, it has been found, that the venal blood, before it enters the lungs, is black and impure; but, as foon as it has paffed through that organ, it is bright and florid.

It would appear, likewife, that fome important change takes place in the lungs on the chyle, which may be fuppofed to be in a crude ftate, till it has undergone the action of that organ, as it has fcarcely entered the fubclavian vein, when it is conveyed with the blood to the heart, and from thence to the lungs, before it is diftributed by the arteries throughout the fyftem. The heart and the lungs, co-operating in the formation of the blood, and in converting the chyle into its fubftance, are in continual action. The heart is one of the mufcles in the body that never tires, nor

grows

grows wearied from its long continued, conſtant, and uninterrupted violent motion. The will has no power nor controul over it either to encreaſe or diminiſh its action. And it never ceaſes its alternate contractions and dilatations from its firſt exiſtence to the cloſe of life.

The will has a ſmall degree of controul over the action of the lungs. By ſuppreſſing this action, we can make longer and ſhorter, ſtronger and weaker, inſpirations and expirations; but this power cannot be exercifed for any length of time together, as the blood is continually flowing into the veſſels of the lungs by the pulmonary artery, and cannot paſs into the pulmonary veins while the lungs are kept diſtended with air. The blood accumulating occaſions an uneaſy ſenſation; to remove this, the natural functions of the lungs, on being

reſtored,

reftored, act by quick infpirations; to make up the lofs of time by which the blood receives the advantages above mentioned, the pulfe and the breathing keep pace with one another: a quick pulfe occafions a quick, breathing three or four of the former to one infpiration and expiration in man. In a horfe, they are fewer on account of the flownefs of his pulfe in proportion. The lungs, like the heart, are conftantly in motion dilating and contracting, by drawing in frefh air and throwing out contaminated air as defcribed above. This action continues without interruption while life remains.

We have occafionally hinted in this chapter that, in certain chronic difeafes, the blood is liable to morbid changes even while it circulates in the living body; but thefe morbid changes will fall more pro-

perly

perly to be noticed when we come to treat of thoſe chronic diſeaſes in which the blood is ſuppoſed to be affected.

With regard to any information that may be drawn from the appearance of the blood in acute diſeaſes when cold, it will be found, that no certain concluſion can be formed from it, ſince blood that is drawn from a horſe, who is evidently diſordered, will ſometimes have the ſame ap-apearance, when cold, as that drawn from a horſe in health. On the other hand, blood, drawn from a horſe in health, will ſometimes have all the appearance of that drawn from one labouring under the moſt dangerous acute diſeaſe; and this may depend on ſo many concurring cauſes that renders it difficult to fix any preciſe ſtandard how we may judge either of the healthy or morbid ſtate of the blood in horſes or other animals when cold; as its

appearances

as its appearances are even affected by the manner in which the operation of blood-letting is performed, and that of the blood's being received into the veſſel whether by a full ſtream or otherwiſe.

Thus we have endeavoured to explain the nature and properties of the general maſs of the blood, out of which all the particular fluids, or humours, in the animal body are drawn and made: we ſhould now proceed, agreeably to our plan, to give the pathology of the blood ariſing from its morbid circulation, which, in ſome diſorders, eſpecially in fever, becomes ſo rapid as frequently terminates in the deſtruction of life.. But as we have not as yet treated on inflammation, iritability &c. it cannot be ſuppoſed that young pupils are ſufficiently prepared for comprehending this ſubject till we advance farther in our explanation of the above and ſome other phenomena immediately connected with it.

CHAP. VIII.

THE OFFICE OF THE ARTERIES, THE PULSE, &c.

IN a former Chapter, when treating on the heart and the circulation of the blood, we had occaſion then to mention the ſtructure of the arteries, ſo far as was neceſſary to explain the function of the heart; we are now more particularly to explain their office, pulſation, &c.

The

The arteries, in a living animal, are always full of blood. The jet or ftream that ftarts from them, on being divided at or near the extremities, is not interrupted by alternate ftops while the heart refts or relaxes itfelf between its dilatations and contractions, but it flows on in a continued thread. The microfcope fhows likewife that the arteries, in living animals, are full both in their fyftole and diaftole, as the circular fibres of the arteries cannot contract themfelves fufficiently to expel all the blood. When a new wave or column of blood is fent from the heart into the arteries, which, being already full, and although it bears but a fmall proportion to the whole mafs contained in the arterial fyftem throughout the body, yet, by its immediate contact with the preceding wave or column, which moves flower as it gets farther from the heart, it forces the fame forwards, lengthens the artery, and makes it aſſume a cylindrical form, which increaſes its diameter by preſſing the membranes cloſer to one another, and forces the convex parts in the bendings of the arteries outwards. This dilatation of the artery, by which its light or capacity is changed from a leſs to a greater circle, is called the pulſe, the diaſtole of which is an expanſion of the artery beyond its mean diameter. This action of the arteries ariſes from the heart only, and is not natural to them when left to themſelves; for when the motion of the heart is ſuſpended from any cauſe, there is no pulſation in the arteries; hence the artery is the more dilated in proportion as the preceding wave or column of blood moves ſlower than the ſucceeding wave which follows it.

The ſyſtole, or contraction of the artery, follows the dilatation of it; for the heart, having

having emptied itſelf, a ſhort relaxation intervenes ; but the artery, by its innate elaſticity and contractile power reſiding in its circular fibres, irritated by the ſtimulus of the blood, contracts itſelf, and expels as much blood as ſerves to dilate it beyond its mean diameter. As ſoon as the artery has freed itſelf from this wave or column of blood, and of courſe freed from diſtention, it collapſes by its own contractile power, and is again ready to receive a new wave or column of blood ſent into it by the heart ; hence follows repeated pulſation in the artery.

The ſwiftneſs of the blood's motion in the arteries is ſo great that it is carried through a ſpace of about one foot in the ſpace of a ſecond of time ; and the conſtant plenitude of the arteries renders it impoſſible

to

to perceive any fucceffion in the pulfes of different arteries, from which it appears that all the arteries beat at one and the fame inftant of time. As foon as the aorta is filled with blood expelled from the heart, it is conftringed, and thence, gradually, the fame contracting power of the arteries proceeds to the extremities, where this pulfation ends, as the blood is then taken up by the veins and returned to the heart.

The arteries may be compared to the trunk of a tree, whofe base begins at the heart, and gradually fpreading its branches as it proceeds to the extremities, where they are loft by their minute branchings. Here the veins originate likewife in fimilar fmall branchings, and, taking up the blood, convey it to ftill larger and larger trunks, till at laft, as it approaches the heart, it is collected in two large veins, and conveyed into

into the auricle of the heart, and thence proceeds in a new circulation.

We have already mentioned the velocity with which the blood comes from the heart. But that velocity continually decreafes from the refiftance it meets with in the fmaller arteries, as their membranous coats are thicker and ftronger as the arteries grow lefs; befides the conical figure of the arteries themfelves ftill growing narrower, and the wave of blood coming from the larger trunk, the blood is refifted in its paffage through the minuter arteries, and therefore muft be diftended by force: the inflections and folds in the plates of the veffels likewife contribute to retard the motion of the blood, as fome part of the impelling force muft be fpent or loft in removing thefe inflections in the veffels, and changing their figure into that of a round bore. The angles

gles in the veſſels take more or leſs from the impelling force in proportion to their acuteneſs, or the more they recede from a ſtraight line: allowance muſt likewiſe be made for the viſcidity or tenacity of the blood itſelf, which, from indolence and too much reſt, is diſpoſed to harden into clots, and adhere to the ſides of the arteries in the ſame manner as is obſerved in aneuriſms and wounds of the arteries.

From theſe conſiderations, we may obſerve, that the blood, in the courſe of its circulation, meets with the greateſt retardation in the leaſt and ſmalleſt veſſels. And this oppoſition muſt leſſen the velocity of the blood in the larger trunks of the arteries, and to this may be added the oppoſition of torrents of blood to one another in the anaſtamoſing of the ſmaller veſſels.

The

The blood in a living animal flows with the rapidity of a torrent in the larger trunks of the arteries; hence a wound in a ſmall artery near the heart is more dangerous than a larger one at a diſtance from it; but in the ſmaller branches, it creeps along very ſlowly, and it is in theſe veſſels it begins to put on a ſtate of coagulation.

Since, therefore, as the force of the heart decreaſes as the blood goes on, and the contractile power of the arteries increaſes, the anterior wave or column of blood moves on ſlower, while the ſubſequent comes faſter; wave ſucceeding wave forms the pulſe or that beating in the arteries between their dilatation and contraction, which may be beſt felt where the artery lies expoſed bare to the touch, upon ſome reſiſting bone. But local inflammations frequently renders the pulſe perceptible, where it never is ſo

 naturally.

naturally. In the human body, it is eaſily felt in the wriſt. In our ſubject in the temporal and carotid arteries, and on the inſide of the knee.

The pulſe therefore is the meaſure of the powers which the heart exerts on the blood. In a healthy ſtate, the pulſe is ſlow and equal, becauſe the heart, being free from any ſtimulus or unnatural reſiſtance, is at full liberty to propel the blood with eaſe. A large full pulſe ſhows that the blood flows through the artery without interruption. A ſmall pulſe ſhews the emptineſs of the artery, on account of a ſmaller wave or column of blood being then ſent from the heart. A hard pulſe denotes ſome obſtacle or reſiſtance to the force of the heart, or it may be ariſing from a greater thickneſs of the blood, or from an increaſed rigidity of the coats of the artery. A quick pulſe denotes

notes ſome ſtimulus or morbid ſenſibility, or irritability, of the heart.

The pulſe is ſlower in large and bulky animals than in the ſmaller kinds of the ſame ſpecies. The heart in the former has a proportionably larger column of blood to propel to a greater diſtance, and at the ſame time to overcome the reſiſtance or friction of the arteries.

The pulſe in a healthy man beats about 65 in a minute; towards evening it will beat about 80; in a horſe about a middling ſize, about 45 in that time. Exerciſe through the day always increaſes the pulſe towards the evening; to the ſame cauſe likewiſe is owing the increaſe of feveriſh ſymptoms in patients towards the evening. Sleep not only retards the motion of the blood during its influence, but likewiſe the motion of all the humours in the body. A frequent pulſe is commonly called a ſwift pulſe; it always

takes

takes place in young animals, but grows ſlower as they advance in age. A feveriſh pulſe in man begins about 96 in a minute. It is counted moderate if it does not exceed 110 or 120, but it is conſidered exceſſive when it ariſes to 130 or 140; in which ſtate the patient is conſidered as in imminent danger. The feveriſh pulſe in horſes begins about 80, or in proportion to the ſize of the animal.

Any reſiſtance or hinderance to the circulation of the blood in the arteries, is found to quicken the pulſe, as the heart in endeavouring to free itſelf, and remove the exiſting cauſe, contracts itſelf the more ſtrongly and at ſhorter intervals. Thus, irritation from acrid blood cauſes a frequent pulſe in fevers. Local inflammation, by reſiſting the circulation in the part affected, produces the ſame cauſe.

The

The blood moves but ſlowly in the leaſt or ſmalleſt arterial veſſels, where the veins begin; and as the weight of the blood in many places hinders its return to the heart, and as the coats of the veins have little or no contractile power to accelerate the motion of the blood, Nature has uſed various precautions to prevent its ſtagnating or concreting in the veins, by placing them near to the muſcles, and likewiſe near to the arteries, that by their motion and preſſure the blood in the veins is determined towards the heart. The veins are likewiſe ſupplied with more watery vapours, and flexile lymph, than the arteries, which probably parts with theſe vapours, by the great exhalation that is made from the blood in the lungs. From the above cauſes proceeds that quickneſs of the pulſe, heat of the body, attended with a ſhort laborious breathing, that follows on muſcular motions by active exerciſes.

But, farther, thofe mufcles which conftantly prefs the contiguous vifcera, by their motion on all fides, in the different cavities, powerfully promote the return of the venal blood to the heart ; befides the pulfation of the arteries, which run every where contiguous and parallel to the fides of the veins, have likewife their fhare in promoting this effect ; for, as we have already faid, any impulfe acting on the veins can determine the blood to the heart only.

Hence, the blood in a healthy animal, at full liberty to take fufficient exercife of body, moves on with fuch a velocity as enables it to deliver as much blood at every pulfation, by the vena cava to the heart, as it fends out by the aorta or great artery. But too much reft and inactivity of body, joined with weaknefs of the contracting fibres of the heart and arteries, renders this motion of the venal blood more difficult.

Hence,

Hence follow varicous ſwellings in the veins; and by the ſlow return of the blood to the heart, thoſe ſubtile vapours formerly mentioned, are either abſorbed or exhaled into the cellular ſubſtance, and produce thoſe oedematous and pitting ſwellings in the bodies both of men and horſes, particularly in the legs.

If we compare the blood of a living and a dead animal, that which is healthy with that which is diſeaſed, and that which is inert, or too little moved, with that which circulates ſwiftly, we obſerve that, in the living animal, the blood is conſiderably warmer or hotter, of a more florid red, and appears uniformly alike in all its parts, and on being drawn into a veſſel, it exhales that volatile vapour formerly mentioned.

In the dead animal, which has not yet begun to putrify or corrupt, we obſerve

that

that the blood has loſt a great deal of its redneſs; that it ſeparates into a thinner ſubſtance; that it exhales no vapour; and that it is congealed in the veins. And even in the living animal, where the circulation is ſlow and languid, the blood is cold to a conſiderable degree.

If we compare the blood of an indolent, inactive animal who ſtands much at reſt, perhaps ſtationary or confined to one place, with the blood of one that is accuſtomed to active exerciſes, we obſerve that the blood in the latter has a greater degree of heat, a more intenſe redneſs, more compact in its ſubſtance, and ſpecifically heavier, at the ſame time its volatile parts are more abundant; from all of which it is evident that theſe appearances are the effects of the motion of the heart and arteries, as they increaſe and diminiſh with that motion, and diſappear when that ceaſes.

We

We have formerly obferved, that the heart drives the blood into the arteries with great force, and with a confufed or vertical motion, by which all the particles of the blood are agitated with a confufed turbulent, and whirling motion; being thus impelled againft the curved fides of the arteries, it of courfe dilates or diftends them into a greater convexity; while, at the fame time, the blood is propelled into the fmaller arteries, capable of receiving one or more of the red globules, which, being forced into contact, rub and grate againft the fides of the artery, infomuch that they are forced to change their figure in gaining a paffage into the veins. This friction is fuppofed to generate, and keep up the fluidity of the blood, by perpetually rounding its globules, refifting their cohefion, and blending together particles of different kinds, which become more fluid by their mixing together.

The reticular diſtributions and inoſculations of the arteries prevent any injury or danger that might occur from the loſs of an artery, by being divided or compreſſed from any cauſe, as the next adjoining or anaſtomoſing artery becomes diſtended and enlarged, on the admiſſion of the blood that ſhould have paſſed through the divided or compreſſed artery.

As the quicker motions of the blood, in the larger trunks of the arteries, conduce to ſanguification, ſo the ſlower motions of it, in the ſmaller veſſels, conduce towards the different ſecretions.

We have ſeen that the general current of the blood is carried through the larger trunks with great rapidity; but in the leſſer ramifications of the arteries, the progreſſive motion of the blood is diminiſhed, by which the more looſe and colourleſs particles,

cles, ſeparating from the denſe and red globules, are expelled laterly, and to the circumference. Hence the attractive powers of the particles in the blood increaſe as their progreſſive motion abates. The oily or fat particles, coming into contact, go off by the open lateral ducts that lead to the cellular ſubſtance. The thinner juices are ſent off through lateral branches of a much ſmaller orifice, till at length little more than the red globules of the blood remains to paſs through the evaneſcent artery, into the incipient vein. But theſe particulars, by which ſecretion is performed, we ſhall conſider hereafter.

From what has been ſaid, it will be evident that muſcular motion, or exerciſe,* is of

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* The advantages arising from exercise, and the necessity of using it, especially to those horses who have no stated labour, and stand much at rest, we have

of the greateſt importance in contributing its ſhare towards promoting the circulation of the blood, &c. and of promoting the health of the body; for, without a free circulation of the blood and juices, the general health of it is impaired, and diſeaſes follow.

CHAP.

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have already treated at large in a treatise on the Prevention of Diseases in Horses, and which has now gone through four editions.

CHAP. IX.

ON SECRETIONS.

Having thus confidered the nature and properties of the blood, together with the office of the veffels which contain it, we come now to explain the way and manner in which fluids differing from blood are made out of it, and feparated from it. This is called animal fecretion. Nature always employs the moft fimple means to bring about her ends; fhe is never deficient nor fparing in the means to do every thing in the

the beſt manner, equally avoiding redundancy and defect.

In the human body, and that of other animals of the more perfect kind, a great variety of different juices are required to anſwer a variety of purpoſes; all of which are furniſhed out of the ſame general maſs of blood. The animal body, by certain powers it is endowed with, firſt makes red blood; and then out of red blood, by other powers, it draws off and forms all the other juices. Before we enter upon explaining the manner in which ſecretion is performed, we ſhall take a ſhort view of the ſeveral kinds or claſſes of animal liquids, that are different from blood and made out of it, and then conſider thoſe which are of the moſt general importance to the animal economy.

The

The juices or humours, which being depofited or ftrained from the blood into other veffels, may be divided into claffes.

The *first* includes all the vifcid and lymphatic juices, which are coagulable by fire and alcohol, like the white of an egg, and yet in the living body exhale in the form of vapour; but after death are condenfed into a jelly. Of this fort is the gaftric juice, and thofe fubtile vapours which exhale into cavities, and prevent the parts from growing together, as into the cavity of the abdomen, &c. on being accumulated in too great a quantity, they fometimes produce dropfy, which affumes different names, according to the manner or place in which it is formed, as afcites, anafarca, hydrops pectoris, hydrops pericadii, &c. In the ventricles of the brain, they often create apoplexy.

The

The *fecond* clafs contains thofe juices, which being thinner and more watery than the former, are neither coagulable by fire nor alcohol, as thofe exhaled from the body in the form of perfpiration, fweat, or tears; the finer parts of the latter, after being poured out on the cornea and albuginea, are evaporated into air: the remainder is taken up by the lachrymal fack, and fent into the nofe. Other liquids of this fecond clafs are not evaporated, but conveyed into their proper excretory ducts, as the faliva, pancreatic juice, urine.

The *third* clafs of liquids confifts of fuch as are not coagulable by fire and alcohol, are not gelatinous, but watery, with fome degree of vifcid tenacity, on the watery parts being diffipated, turn into tough hard crufts: of this kind is the mucous or phlegm, which is found throughout all the refpiratory paffages, from the mouth and noftrils

to

to the extreme and remoteſt veſicles of the lungs; over all the alimentary paſſages from the mouth to the anus, throughout the urinary paſſages. The cavities of the genital organs in both ſexes, the ſemen, &c.

The *fourth* claſs of juices, or humours, comprehends thoſe that are inflammable; theſe, when newly ſecreted from the blood, are thin and watery, yet by ſtagnating where they are depoſited, the watery parts being either evaporated or reabſorbed by the inhaling veſſels in the containing receptacles, the oily inflammable part remains. Of this kind is the bile, the wax in the ears, the ſebaceous ſecretions in the ſkin, eyelids, &c. the fat and the marrow, milk as it contains butter.

We have formerly ſeen, in treating on the properties of the blood that it contained, a coagulating ferum, an exhaling vapour, or water, a fort of vifcid mucus and oil, from which we may perceive the poffibility to feparate from the blood all the foregoing claffes of humours or juices, as their conftituent principles are already in the mafs of blood itfelf. But in what manner it is brought about, that oil or fat is feparated from the blood in one part, a watery liquor in another, a gummy mucus in a third, is a queftion that ftill remains to be explained, and requires a previous defcription of the fecretory organs themfelves.

Thofe juices, which are coagulable, are feparated almoft every where from the arteries themfelves into continuous excretory canals.

The albuminous liquor of the joints is fecreted by certain glands called conglomerate, of a peculiar ftructure, which are fituated

ated in the articulations of the bones, ſo that they may be moderately compreſſed, but cannot be cruſhed. This liquid being compoſed of fat medullary oil, and the exhaling liquor, conſtitutes an exceeding ſoft ointment, very fit for lubricatin the cartilages, and leſſening the friction on the parts. The ſtructure of conglomerate glands is peculiar to themſelves, and of a cluſter like fabric, like that of grapes. In the joints, the larger cluſters adhere for the moſt part to the bone, by a broad baſis wrapped up in fat; from thence ſpreading out into a kind of creſted edge, they pour out their liquor from an exceeding thin border by open ducts. Others of a leſſer ſize are placed every where in the capſules of the tendons, and between the diverging fibres of the ligamentary capſules of the joints, which ſeem to be much of the nature of ſimple

ple glands, and are tinged with a yellowiſh mucus ſerum.

Thoſe juices which are not coagulable of the firſt ſort, are ſecreted in the ſame manner with thoſe that harden, that is, from the exhaling arteries, which ariſe from the red ſanguinous arteries, without any intermediate follicle or cavity betwixt them.

The ſalival glands are of the conglomerate kind, theſe glands being looſely conjoined together, into larger maſſes, by the yielding cellular ſubſtance, which forms a denſer coat or covering to the whole, as we ſee in the parotid and maxillary glands. In the intervals betwixt theſe glandular cluſters, run the arteries and veins, which are here conſiderably larger. Each of theſe glands or kernels ſend out an excretory duct, which, joining with others of the ſame kind,

form

form larger trunks, which at laſt end in one canal, and conveys the humour to the part for which it is deſigned, as the cavity of the mouth, inteſtines, ſurface of the eyes, &c.

The *acini*, or kernels of theſe glands, appear to be compoſed of arteries and veins, divided and ſubdivided, parted and connected by the intervention of cellular ſubſtance, whoſe ſtrata, growing gradually more compact as they enlarge, appear moulded into a globular or nut-like figure, as above mentioned.

Thin watery juices, neither coagulable nor wholly evaporating, are likewiſe, in other parts, generated without the aſſiſtance of conglomerate or kernel-like glandules. Thus the urine is depoſited from the red or ſanguinous arteries, into membranous pipes

in

in the kidneys; theſe pipes are found to admit air, water, and even mercury to paſs. In the ſame manner, the nervous juice in the brain ſeems to be ſeparated in this way, although it is leſs evident.

The *third* claſs, or mucus juices, are almoſt every where ſeparated into, and diſcharged from ſinuſes or hollow glands, of ſuch a fabric as makes up a cavity every where ſurrounded by a membrane; theſe glands are very irritable; and when ſtimulated by any acrid ſubſtances, the quantity of their ſecretions are increaſed.

The extremities of the ſmaller arteries open into the above follicles or cells, from which are diſtilled or exhaled their reſpective juices, where being retained, the more watery parts are carried off by the abſorbing veins, which correſpond to, and reſem-

ble

ble the exhaling arteries, by which means theſe juices acquire a conſiderable degree of thickneſs.

The mucous glands have excretory ducts, the orifice of which opens into a larger cavity, where mucus is poured out without any other intermediate duct, as in the back part of the tongue, the ſimple glands of the ſtomach and inteſtines, where they are denominated cryptae or cells. Sinuſes are of the ſame ſtructure as in the urethra of the male.

Another ſpecies of glands, termed *conglutinated*, which are ſimple follicles, folded up together in one common covering, the orifices of which open into one ſinus, without forming any excretory duct, while others have excretory ducts of cylinderic form opening into the cavity where the mucus is to be depoſited. Theſe ducts are

ſometimes

ſometimes of conſiderable length in the ſub-cutaneous and ſebaceous glands, and in thoſe of the palate and windpipe. In ſome parts, the orifice of thoſe ducts are more diſcernable than the body of the gland itſelf, as in the noſtrils, larynx, rectum, &c.

Many of theſe ducts, ariſing from their reſpective follicles, join together and form one common excretory canal; of this kind are the compound mucous glands of the inteſtines, jaws, ſtomach, &c.

Thoſe juices that are inflammable are ſeparated by organs that are of a different fabric. Thus, the fat and the marrow in the bones are depoſited without the intervention of glands; the mouths of the ſmall arteries open into the cellular ſubſtance where the fat is depoſited, without the aſſiſtance of glandular follicles. The oily or ſebaceous linament of the ſkin, &c. are ſeparated

ſeparated by glands of different kinds, many of which lead directly to its follicle by a ſhort paſſage, whilſt others of the ſebaceous glands have ducts of a conſiderable length. Theſe ſebaceous glands are very viſible in ſome parts of the human body, as in the noſe, &c. from the black concreted maggot-like ſubſtance that is forced out by preſſure.

The milk, being formed of oil and watery juices, is ſeparated by thoſe glands that are termed conglomerate, formerly deſcribed.

The bile is ſeparated in the liver, which being of a vaſcular fabric, it is diſtilled a it were from the biliary ducts, without paſſing through any cells or follicles into the common receptacle. But as our ſubject hasno gall-bladder, it paſſes into the inteſtines without any interruption or hinderance.

To a reflecting mind, it is matter of aſtoniſhment how, from one common maſs of blood, the ſame variety of peculiar juices are conſtantly ſeperated, each in its reſpective place; for we never ſee milk ſecreted in the kidnies, nor bile in the thymus gland, nor mucous in the ſebaceous glands; this depends on the fabric that obtains in each ſecretory organ, adapted by nature to perform ſuch and ſuch effects.

It would appear that the blood, from whence any juices or liquids are to be ſecreted in the various organs of the body, aſſumes a certain character or diſpoſition, in theſe parts, peculiar to itſelf; and that by conſtantly aſſimilating particles from the blood of a like nature with the humour or

juice

juice which nature intends to be feparated from it at that particular place. For inftance, the venous blood is carried to the liver with a very flow motion, full of oil or fat in a liquid ftate, and at the fame time full of femi-putrid vapours from the inteftines. In like manner, the blood is conveyed very flowly to the tefticles, through very long, flender, and inflated canals, beginning at very fmall angles, and paffing out of the abdomen under the fkin, expofed to the external cold, which affords time for the different particles of the blood to be affimilated and collected together. It is probable that the more fpirituous and denfe parts of the blood afcend by the carotids to the brain, while the more watery parts of it defcend into the abdomen and kidnies, as alfo to the forming the falival juices of the pancreas, the juices of the ftomach and inteftines.

The

The blood is farther prepared for ſecretion from its being retarded in the ſmall veſſels, the red and denſer parts being carried along the axis of the veſſel, while the lighter and more ſluggiſh particles, moving with leſs velocity, are preſſed laterly into the ſecretory orrifices, which paſs out from the ſides of the veſſels, where they adhere by their viſcoſity.

Theſe orifices, though of different diameters, are yet very ſmall; and in their natural and healthy ſtate do not admit of the red globules of blood, yet they may, in certain caſes of diſeaſe, be ſo far enlarged by an increaſed force of the heart, as to admit the red globules occaſionally; for it has been obſerved, that when thin watery liquors have been injected into the arteries that they eaſily find admiſſion into theſe ſecretory orifices or ducts, but do not admit of the thicker kinds of injections, as of wax, ſuet, &c.

&c. This kind of ſecretion is of the ſimpleſt kind, as the orifice or excretory duct can only admit of particles leſs than their diameters. Hence it is, that a pure liquor is ſecreted from the blood, and that the urineferous ducts exclude both red blood and coagulable ſerum in the kidnies.

It would appear that the ſecretions are generally made immediately from ſanguineous arteries, without paſſing through the ſerous lateral ones; theſe ſeparate the groſs juices, thick, coagulable or watery, as the fat, urine, the juices of the ſtomach and inteſtines, &c. The ſecretions of the other thinner juices are made from the ſmaller pellucid arteries, whoſe orifices do not admit red blood, ſerum, fat, or other groſs juices.

Theſe

These small secreting arteries compose a kind of net work, and in general resemble the branching of little trees or shrubs. The trunks and arms of them sending out branches in every direction, and in different angles; they are visible on the intestines, and resemble pencil brushes, and they are very thick and numerous on the spleen. In the kidnies, they have some resemblance to twisted serpents; in the liver, they are like stars; and in the testicles, they are like a lock of hair curled up like a button. It does not appear that there is any affinity between the fabric of the vessel and the nature of the liquor it secretes.

The inflexions or bendings of the smaller vessels, or excretory ducts, retard the motion of the blood, by which the viscidity of the juice to be secreted is increased, by giving its particles more time to cohere, or attract each

each other; on the other hand, a ſtraight courſe of theſe veſſels adds to the celerity of their fluids, where a frequent copious ſecretion is required, as in the urine.

Theſe concluſions may be drawn from the ſtructure and appearances of the parts, from injecting the arteries to ſhew that nature by various methods can modify the ſecreted humours, by joining together, or ſeperating and imparting to the various ſecretory organs certain powers of retarding or accelerating their juices, in order to produce thicker or thinner fluids, to anſwer the different purpoſes required; as is obſerved in thoſe that ſecrete the bile and ſemen, which are thick juices, and in the urine and tears which are more watery.

But though the proceſs which nature obſerves in performing animal ſecretion within the

the glands cannot be explained; it may be aſſerted with great probability, that there is in the animal body certain aſſimilating powers, which in the ſecretory organs gives the particles procured from the blood their own proper quality, although theſe particles were before of a different nature.

We have already ſhewn that the blood contains particles of various kinds; thoſe which are largeſt and moſt denſe, as the cruor, will in the courſe of the circulation proceed onwards in the axis of the veſſel, ſo as to paſs on in a continued courſe from the artery into the beginning vein, while thoſe particles that are more ſluggiſh, as the fat, &c. will go off laterly by the orifice from the ſanguineous artery, as in the ſecretions of the fat.

All the juices that are ſecreted, even the thickeſt kind, contain a great portion of water, which is afterwards ſeparated from them

in

in glands with larger and ſmaller follicles or reſervoirs, formed by nature for retaining the ſeminal juices, and to render them more thick and viſcid. Thus the mucus, on its firſt being depoſited, is thin and watery, differing but little from the perſpirable matter, in which ſtate it diſtils into the cavity of the noſtrils, wind pipe, and inteſtines ; but, on long retention, the watery parts are abſorbed, and it becomes viſcid and thick, as is obſerved in coughing, blowing the noſe, &c. in the human ſubject, and in the horſe when he ſnorts, and throws out from his noſtrils very thick mucus ; we have likewiſe examples of this in many inſtances, the bile at its firſt ſeparation in the liver, is watery ; the ſemen becomes thickened, by being retained in the ſeminal veſicle ; but after repeated acts of venery, it is expelled very fluid ; hence it would appear that there are no real glandules, excepting thoſe that are formed for ſecreting a viſcid liquor; and if a viſcid liquor is ſeparated from an artery, without a follicle, it always ſtagnates in a larger one afterwards.

It would appear that one great end or uſe of the follicles and receptacles of glands, is to preſerve the juice or liquor of whatever kind that is ſecreted for thoſe times or occaſions in which it is moſt neceſſary to be employed in the animal oeconomy. Thus the bile is reſerved for the time of digeſtion. The ſemen for due venery, and the mucus in the noſe to temperate the irritation of the refluent air.

Whatever is abſorbed of theſe ſecretions and conveyed into the blood, is of great uſe to the animal body, according to its nature. Thus the abſorption of the ſemen gives a

ſurpriſing

ſurpriſing ſtrength and vigour to male animals.

We have thus endeavoured to deſcribe the means and inſtruments of ſecretion, by which the ſecreted juices are either retarded or forwarded, according to the purpoſes of nature in the animal oeconomy. There are likewiſe proviſion made by nature to expel certain ſecreted juices, at convenient and proper times, when they are required. Some glands have particular muſcles adapted for this purpoſe, as in the teſticles of brutes; the urinary bladder; the gall bladder in the human body. In other parts muſcular fibres are placed around certain organs, in order to expell or ſqueeze out their contained fluid, as the muſcular coat of the ſtomach and inteſtines.

In other parts contiguous and incumbent muſcles are added to promote ſuch diſcharges, as in the maſſeters of the lower jaw; another

other mode obferved by nature is irritabili-ty, which, on being excited to action by any ftimulus, opens the fhut paffages, as in the difcharge of milk and tears, &c. Sti-mulating matters occafion the thinner juic-es to flow moft copioufly, as from the nofe, ftomach, inteftines.

What we have obferved above will pre-fent a compendious view of the general doc-trine of fecretion. It is to be obferved, that the greateft fecretions are performed with-out the intervention of any fuch contriv-ance or ftructure under the appellation of gland; as the fecretion of the fat, perfpira-tion, lymph, and even nutrition, may be very juftly reckoned a general fecretion. All thefe are performed by the fimple me-chanifm of lateral tubes, of determined dia-meters, arifing from larger ones, without any peculiarity in their ftructure that can

denominate

denominate them of glandular contrivance.

We come now to confider the pathology or difeafes that are peculiar to glands and glandular parts. In the human body thefe are fchirrus, which generally precedes a cancer. The latter of which feldom occurs in our patients; but a fchirrofity in the glands is not uncommon as an attendant on fome difeafes.

A fchirrus is a hard tumour in a glandular part, occafioned by an obftruction in the fecretory tubes. Often fcabrous and unequal on its furface, more efpecially when it takes place in fuch glands as confift of pretty large *acini* or kernels, as in the falivary glands.

We have already fhewn, that in glands fecretion is performed by fecretory tubes, that are of too fmall diameters to admit red

globules

globules of the blood; and that the compound glands are made up of a congeries of convoluted tubes, which renders them liable to obſtructions, both on account of the ſmallneſs of theſe canals, and their complicated ſtructure, being rolled up like clues of thread, which increaſes the difficulty of their tranſmitting liquids even in a healthy ſtate, and much more ſo when they become turgid or ſwelled from any latent diſeaſe, or from contuſion. For it is obſerved by anatomiſts, that they can puſh their coloured ceraceous injections into very minute veſſels, in membranous parts all over the body, but meet with great difficulties in injecting whatever is of glandular ſtructure.

The cauſes of ſchirrus are whatever may contribute to thicken the juices that are to paſs through theſe glands, or whatever may obſtruct

obſtruct or render narrower the minute ſecretory tubes, ſo as to hinder the propulſion of the liquids through them. Hence a reſiſtance being thus cauſed to the progreſs of the humours, tumours and hardneſs of the gland is produced.

Glands likewiſe become tumified and inflamed on catching cold; this is obſerved both in men and in horſes. The glands about the throat, in ſome caſes, are much affected; and in ſome diſeaſes when the virulent matter is abſorbed, and paſſing through them, they become inflamed and ſwelled, which ſometimes terminates in ſuppuration. Thus in a gonorrhoea in the human body, the inguinal glands in the groin are affected; and in horſes that are glandered the ſubmaxillary glands become ſwelled and inflamed, from the abſorption of the virulent matter; ſymptoms attending theſe diſorders.

The

The ſubmaxillary and parotid glands in horſes are frequently liable to inflammation and ſwelling on catching cold, eſpecially in young ones. This diſorder is called the ſtrangles, and perhaps few or none of them eſcape that diſorder at an early period of life; the inflammation and ſwelling of theſe glands frequently terminate in ſuppuration, and diſcharge pus or matter either externally or internally, by the mouth and noſtrils, which terminates the diſorder.

In all recent glandular ſwellings, reſolution ought firſt to be attempted by external diſcutient applications, as emollient pultices, fomentations made with emollient or diſcutient herbs.

In caſes of cancer, whatever tends to heat or irritate the conſtitution, or to thicken the humours, whether in diet or medicines, externally or internally ought to be carefully avoided. While the integuments remain whole, and no matter iſſues from the affected part, the cancer is termed occult, but where there is a breach or opening, and the tumor attended with a diſcharge of foetid ſanies matter, it is then termed an open or exulcerated cancer.

No remedy has as yet been found out ſufficiently warranted by experience to be depended upon as a radical cure for a confirmed cancer, even that of extirpation as a palliative cannot be depended on; and in our patients when glands appear indurated from the abſorption of virulent matter, from their proximity to an ulcer, or from virulent matter paſſing through them, as theſe are only ſymptoms of the diſeaſe, the extirpating of them, as has been too frequently done through ignorance, more eſpecially the ſubmaxillary glands, in that diſeaſe called the glanders, can have no effect whatever in removing or curing the difeafe,and only creates additional pain to the already diftreffed patient.

Deep feated glands are liable to difeafe in various other parts, particularly in long continued chronic complaints, the true feat of which cannot be afcertained, while the animal is in life, and can only be obferved on diffection Some glands are more liable to be affected than others. The lymphatic glands in our patients are more frequently found indurated than the mefenteric glands. The office of the febaceous glands of the fkin, in fome difeafes, are either fufpended or fo far altered that the fkin and hair appear dry and fhrivelled, which is called hide bound. The febaceous glands in the eyelids are fometimes fo affected in inflammation of the eye, that the juices fecreted from them becomes fo vifcid as to glue up or cement, as it were, the eyelids. The mucus glands fituated in the pituitary

membrane

membrane in the noſe, become inflamed in recent catarrhs and colds; hence the mucus ſecreted from them is conſiderably altered, from its natural healthy ſtate, to that which is viſcid, thick, and glutinous, ſo as to impede or blunt the ſenſe of ſmelling.

CHAP.

CHAP. X.

OF THE ABSORBENT VESSELS.

HAVING treated on the blood veſſels and the different ſecretions drawn from the blood, we come now to conſider another ſyſtem of veſſels called abſorbents, or the lymphatic ſyſtem, a knowledge of which is of the greateſt importance to the veterinary pupil.

This

This ſyſtem conſiſts of the lacteals, the lymphatic veſſels, and the thoracic duct, The glands belonging to them are of the conglobate kind.

The lacteals are pipes or tubes which in ſome meaſure reſemble the ſmalleſt veins, which contain the red blood, but the contents of the lacteals reſemble milk. They take their riſe from the villi or numerous orifices on the inner ſurface of the inteſtines; from thence they paſs obliquely through the coats of the latter, and enter into that part of the meſentery to which they are attached. As they proceed they unite with other lacteals, and form larger branches on the meſentery, and, paſſing through the meſenteric glands, continue their courſe till they arrive at the thoracic duct. Their office is to abſorb or ſuck up the chyle or white milky liquor contained in the inteſ-

tines,

tines, which is feparated from the food or aliment by digeftion, and convey it to the thoracic duct; from thence it paffes into the fubclavian vein, where it is mixed with the blood.

The lymphatic abforbent veffels are very fmall tranfparent pipes or tubes refembling the lacteals, of which there are two fets, the one fuperficial on the furface of the body, the other deeper feated. The fluid they contain is generally pellucid like water, and as various in its kind as the different parts from which it is derived. They originate from every part, from the extremities, from internal cavities, and from every organ within the body; they likewife convey their contents into the thoracic duct in their courfe to which, many of the deeper feated lie clofe to the larger blood veffels.

The thoracic duct is a continuation of the trunks of the lacteal and lymphatic veffels, but of an indefinite fize or fhape varying

varying in different ſubjects; ſometimes no larger than the ducts themſelves, in others conſiderably enlarged and divided into large irregular trunks. It lies in a longitudinal direction below the vertebræ of the ſpine, near the emulgent arteries, paſſes obliquely under the aorta; its anterior part, running foreward towards the extremity of the duct, opens into the left ſubclavian vein, where its contents mix with the blood.

The thoracic duct, the lymphatics, and the lacteals, are furniſhed with ſtrong coats, although they appear thinner and more pellucid than thoſe of the blood veſſels; for, on injecting them with mercury, they reſiſt a column of that fluid the weight of which would burſt the blood veſſels.

The coats of theſe veſſels are ſupplied with arteries and veins for their nouriſhment; hence they are ſuſceptible of inflammation, as they

they are frequently obſerved, in ſuch caſes, in the form of a knotted cord, extremely painful when touched, and extending from an ulcer to the neareſt lymphatic gland, as we ſee in caſes of the farcy: the pain attending theſe ſwellings of lymphatic veſſels evidently ſhow that their coats have a great degree of ſenſibility, and that they are ſupplied with nerves as well as arteries and veins.

The lymphatic veſſels in moſt animals are full of valves, which are more numerous than in the red veins; they are generally of a ſimilar ſhape, and run in pairs. In ſome parts of the body, theſe valves are placed ſo near one another as to be but a few inches diſtant; in other parts, a conſiderable ſpace intervenes without one ſingle valve. When theſe veſſels are diſtended with lymph, they appear larger on that ſide of the valves next to the heart, which gives them the appearance of being made up of

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a chain of veſicles; wherever a lymphatic veſſel enters the thoracic duct or into a red vein, there are valves which prevent the return of the lymph, and at the ſame time hinder the blood from entering into the lymphatic.

Theſe lymphatic veſſels in their courſe to the thoracic duct paſs through thoſe glands which are peculiar to them, and which are called conglobate or lymphatic glands. Theſe glands are ſo placed, that the lymphatic enters on one ſide and paſſes out on the other. They are ſometimes of a round ſhape, and ſometimes oval, frequently flattened, and of various ſizes. They vary in ſize and colour in different parts of the body and at different times of life. In young animals, they are generally of a reddiſh brown colour, and become paler with age. They are covered with a ſmooth denſe coat, which gives the external ſurface a ſhining appearance. Theſe glands

 are

are furniſhed with arteries, veins, and nerves, which enter into their compoſition, but with reſpect to their internal ſtructure little is known.

The lymphatic veſſels, as we have ſaid, are diſtinguiſhed into two kinds, the ſuperficial and the deep ſeated. The ſuperficial runs between the ſkin and the muſcles, and properly belongs to the ſurface of the body, and to the cellular membrane which lies immediately under it. Thoſe that are deeper ſeated, lie amongſt the muſcles, and accompany the arteries, one on each ſide.

The thoracic duct which receives the contents of the veſſels we have deſcribed, varies in its ſize, in different ſubjects, and is formed by the union of the larger trunks of lymphatic and lacteal veſſels, and frequently forms ſudden enlargements, or what is called ſaculi or bags.

We

We have already obferved, that the lacteals contain the chyle, which is that white milky like juice extracted from the aliments in the inteftines, and afterwards mixed with the blood. Its principal compofition is water and oil; fweet to the tafte, and of a white colour. It is of an acefcent and coagulable nature, and fo light that it fwims on the blood. Being compofed of vegetable farina, with oil and animal lymph, it retains the properties of the volatile, animal, and oily aliments; changes into milk with very little alteration, but afterwards becomes more glutinous. If the watery parts are exhaled from it, and expofed to heat, it coagulates into a kind of jelly.

The motion and abforption of the chyle have been attributed to the attraction of the capillary veffels; but it would appear, that they have the power of felecting the chyle

only

only, and of rejecting thicker fluids, they obſerve alternate pulſes, as it were, with the periſtaltic contraction of the inteſtines. The villoſity on the inteſtines abſorbing the chyle, while the periſtaltic force empties it, and preſſes the chyle farther foreward in its courſe towards the thoracic duct, its farther progreſs ſeems to depend on the ſtrength of the coats of the lacteal veſſel; it is farther aſſiſted by the alternate compreſſure of the diaphragm.

The chyle on being mixed with the blood does not immediately change its nature, but after it has circulated through the body, and mixed with a variety of animal juices, it is at length ſo changed that a part of it is depoſited in the cellular ſubſtance, under the denomination of fat; other parts are converted into the red globules and ſerum of the blood. The thinner and more

watery

watery parts paſs off by urine and perſpiration, while ſome of it is retained in the habit for farther purpoſes in the animal œconomy.

The chyle is conveyed into the ſyſtem with conſiderable rapidity, as it has been obſerved by experiments to move in the lacteals at the rate of eighteen or twenty feet in a minute, hence the vigour that we perceive in ourſelves, ſo very ſoon after a moderate meal, and the renovating effect of cordials upon the ſyſtem in certain caſes, likewiſe the effect of diuretic medicines taken into the ſtomach, and their quick operation by urine, &c.

We have already obſerved, that the abſorbent or lymphatic ſyſtem, in all perfect animals, originate from every organ, from every cavity within the body, from the extremities,

tremities, and from the furface; hence every particular organ, and every part of the body, has its own lymphatics or abforbents, all of which terminate in the thoracic duct as a receptacle, and from thence is conveyed into the blood. The lacteals may, therefore, be confidered as the abforbents of the chyle, from the inteftines only, as their origin from the inner furface of the latter, where they begin by very fmall orrifices, may be eafily traced to the throacic duct by giving an animal milk, and opening it a few hours after; the fame fluid that is found in the inteftines will likewife be feen in the lacteals; but, at the fame time, the inteftines have their lymphatics as well as other organs of the body. We fhall not, therefore, enter into a particular detail of the lymphatics arifing from the different parts, by defcribing their courfe, &c. as it might tend to embarrafs the young beginner. Let it

fuffice,

ſuffice to obſerve, that their uſe and office is the ſame throughout every part of the body, from its internal cavities, and from its ſurface, &c. and that the fluids contained in all theſe lymphatics ariſing from different parts, though various in its kind, yet agree in their qualities, tranſparency, and conſiſtence.

Thus, we have endeavoured to give a ſhort deſcription of the ſtructure and functions of the abſorbent ſyſtem, a knowledge of which is of the grateſt importance to the veterinary ſtudent, as it throws conſiderable light on the nature and cauſe of many diſeaſes in horſes, which were formerly attributed to what is called *Humoural Pathology*, where the blood was ſuppoſed to be vitiated almoſt in every diſeaſe, as being too groſs, viſcid, or too thin, or, as the phraſe was, full of humours.

But,

But, from the lymphatic abſorbing ſyſtem, we are able to account for many appearances in diſeaſes, and to effect changes in the conſtitution on more rational principles. To the above ſyſtem has been aſcribed the power of new modelling of parts, and the various changes attending it, whether in health or diſeaſes. Thus ſome glands that are very large in young animals, as the thymus is in a great meaſure abſorbed on the animal approaching to maturity, many parts that were at firſt vaſcular are removed by the abſorbents. The ſolids and fluids are continually changing, and carried back into the blood by the ſame means. Coagulable lymph is abſorbed, extravaſated blood carried off, and, not unfrequently, collections of water are taken up by the abſorbents, and thrown out of the body by urine, &c. The ſuperficial abſorbents act on the ſurface of the body, by abſorbing ſubſtances that come in contact with it, whether

ſalutary

ſalutary or noxious. Hence the variolous matter of the ſmall pox, or cow pox, is introduced into the ſyſtem, which is called inoculation. Poiſon of animals is likewise introduced in the ſame manner. Mercury as a medicine which, in many caſes, could not be given by the ſtomach, when rubbed on the ſurface of the body is abſorbed by the ſuperficial abſorbents, and produces ſalivation, &c. And it is probable that morbid contagions, or epidemical diſeaſes, are taken into the conſtitution by the ſuperficial lymphatics, or by thoſe of the lungs in breathing. The itch and gonorrhea are likewiſe communicated by the lymphatics to ſound bodies by contact with the diſeaſed.

The whole ſurface of an animal body ſeems to be a ſeries of pores by which exhalation and inhalation are continually carried on by perſpiration or abſorption. Some matters are thrown out of the body, while others are received or taken in. Thus humidity is abſorbed from the ſurrounding atmoſphere by the ſuperficial lymphatics; hence it is obſerved that horſes and other domeſtic animals, when expoſed to its influence, do not drink ſo much water as when they are kept warm and houſed; and many animals who are conſtantly expoſed to all kinds of weather, night dews, &c. drink little or no water. Sea-faring people, in certain ſituations, have likewiſe found, when deprived of freſh water, that, by wetting their cloths with ſea water, their thirſt has been greatly abated. From this circumſtance, it would appear that the ſuperficial abſorbent veſſels poſſeſs the power of rejecting the particles of ſalt contained in ſea water, and of taking in the watery parts only.

The deeper ſeated abſorbents ſeem to act both on the ſolids and fluids, and as theſe are continually changing the abſorbents carrying back into the maſs of blood what they have abſorbed from the

different

different parts, and which is again redeposited in some other part, by the arteries. Thus it is observed that bony excressences as exostoses or splents are removed or disappear, more especially when the surrounding vessels have been stimulated to unusual action by external applications.

We have thus described the action of the absorbent system in the healthy state only; but it would appear, from a variety of circumstances in diseases, that they sometimes act with too great force and energy, and sometimes with little or none, being almost inert and inactive; in the latter case, they require to be roused, as it were, to action by stimulating applications, such as frictions, mercury, cantharides, and even the actual cautery.

This absorbing power of the lymphatics does not always depend on the strength of the general system, for it has been observed, that they frequently act with greater force or en-

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ergy when the ſyſtem appears rather weak; at other times, they ſeem to act faintly when the ſyſtem is in greater vigour; but, in general, they act in proportion to the ſtrength or weakneſs of the conſtitution.

In ſpring and autumn, particularly in the latter, if very wet, which is the moulting ſeaſon with horſes, ſome very material change ſeems to take place in the conſtitution, more eſpecially in thoſe who have undergone great fatigue, and much expoſed to the inclemency of the weather. A certain debility and weakneſs pervades the whole ſyſtem, attended with local ſwellings, and ſometimes large anaſarcous ſwellings on the belly and breaſt, watery ſores in the legs and heels, which ſhews that the depoſite of fluids in theſe caſes is greater than the abſorbent veſſels can take up, or that the abſorbent ſyſtem is then weaker.

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The ſuperficial lymphatics in horſes are particularly affected in that diſeaſe which is called the Farcy; and probably they are the chief ſeat of that diſeaſe, as they appear in its firſt ſtage like a knotted cord under the ſkin. As the diſeaſe advances, the lymphatic valves become inflamed, forming numerous puſtules, or what is called farcy-buds, which open and diſcharge a kind of ſanious matter, peculiar to that diſeaſe. Now, as the glanders is frequently either an attendant on the farcy, or in ſome caſes the forerunner of it, hence if a farcy-bud or buds break out in the ſuperficial lymphatics, ſituated in the pituitary membrane within the noſe, whether in its cavities, or ſinuſes, it forms an ulcer which produces a diſcharge from the noſtrils, reſembling that which comes from the farcy-buds on the ſurface of the body. Here then is an ulcer, or rather, as in ſome caſes, numerous ulcers formed, of the moſt inveterate kind, and which has hitherto reſiſted all the efforts of art to cure it.

No doubt the concealed ſituation of theſe ulcers which are formed in the cavities of the noſe are one great obſtacle to the curing of this diſorder, as they are frequently found on diſſection to be in ſuch ſituations as are out of the reach of all external applications, whether adminiſtered by the noſtrils, or by any number of perforations that could be made over the different ſinuſes of the head by trepaning in different places. Therefore any attempts made with a view of curing the glanders, when it becomes confirmed, muſt be by internal remedies; and as the veterinary ſcience is ſtill in its infancy, we would recommend to thoſe who have the ability and opportunity of making experiments, not only on glandered horſes, but in every caſe of diſeaſe relating to that animal, that they would perſevere in their ſtudies, and commit their remarks and obſervations to writing, adhering ſtrictly to matters of fact at all times, and in all caſes.

CHAP.

CHAP. XI.

INFLAMMATION.

WE have hitherto mentioned the terms inflammation, and of inflammatory diſeaſes, in a general way. We are now to endeavour more particularly to explain what is meant or implied by the term inflammation, when applied to diſorders of the animal body, whether external or internal.

In our definitions of inflammation we have ſaid in general, that it is an accumulation of blood in any part of the body, whether external or internal, and that this accumulation of blood in the minute veſſels is brought on by increaſed circulation of that fluid, ariſing from various cauſes.

Inflammation is a diſorder to which every organized part of the body is liable we ſhall therefore conſider it in its ſimpleſt form, and its ſeveral conſequences, as it is obſerved to occur externally; and as the phenomena attending it will be more eaſily underſtood from conſidering it in that ſtate, we ſhall begin with local inflammation in a circumſcribed tumor, or what is called phegmonous inflammation attended with a boil on the ſurface of the body, originating without any apparent cauſe. In this diſorder the part affected is attacked with

uncommon

uncommon heat; tenſion, a throbbing pain, and in the human white ſkin with redneſs. When the tumour is of a ſmall extent, it has no great influence on the general ſyſtem, but when it happens to be conſiderable, and the inflammation extenſive, a degree of fever takes place, attended with a full, quick, and generally a hard pulſe, univerſal heat, and great thirſt; this is termed ſymptomatic fever.

We have obſerved above, that every organized part of the body is liable to inflammation, therefore what takes place on the ſurface, as in the above caſe of phlegmon, will likewiſe take place on the internal organs; and although at firſt the inflammation may be local or circumſcribed, yet it may become more extenſively diffuſed, of which we have daily experience. We know that any external violence done to the ſurface of the body, as wounds, bruiſes, and ſtimulating or irritating ſubſtances rubbed on the ſkin, will produce inflammation on the part that is injured; here we know both the cauſe and the effect. Let us now enquire how inflammation takes place where no apparent or viſible cauſe can be aſcribed.

Various opinions have been advanced with reſpect to the proximate cauſe of inflammation, many of which, being founded only on conjecture, have never been generally admitted, others, after having prevailed for a time, have likewiſe been rejected. But the preſent doctrine on this ſubject is ſupported by ſtronger arguments in its favour than any that has hitherto been advanced, and which is ſuppoſed to proceed from an increaſed action of the heart and arteries, combined with a ſpaſmodic conſtriction of the extreme veſſels.

This doctrine readily accounts for the action of the ſeveral exiſting cauſes of inflammation,

flammation, for the effects it produces, and for the operation of the medicines and other means that have been uſed in the method of cure. Theſe proofs will eſtabliſh the probability of its being the proximate cauſe of all inflammatory affections; the different phenomena which occur in inflammation, ſeems, in every caſe, evidently to ſhew an increaſed action in the veſſels of the part affected; from this increaſed action in the arteries of a part, all the circumſtances attending inflammation are eaſily explained, from which we are led to conſider ſuch a ſtate of the veſſels as one cauſe, or rather the proximate cauſe, of inflammation.

This doctrine is farther ſupported from conſidering the ſeveral exiſting cauſes of external inflammation, as they generally are of a ſtimulating or irritating nature, and when applied to any living or ſenſible parts, they always are attended with a preternatural exertion of the veſſels in ſuch parts.

Thus, corrosive and other irritating substances, applied to the coats of the arteries, produce the same effects as in other muscular organs. Every organ in the body have their own peculiar stimulii, exciting them to action in their different parts. The food or aliments stimulate the stomach and intestines; the blood stimulates the internal surfaces of the heart and blood-vessels to perform their functions. Hence therefore we can account for the action of all direct stimulants in the production of inflammation.

But it frequently happens, that general or diffused inflammation takes place, when neither stimulants nor irritating substances have been applied in any shape. We therefore conclude that in such cases the increased action

action of the heart and of the arteries, seems to arise from spasm or constriction of the extreme vessels, either of a particular part, or of the general system, as in fever.

From the tonic or astringent power of cold, we can account for the frequent occurrence of inflammatory diseases in long continued dry-cold winds. As the throat and lungs are more subject to these disorders, attended with inflammation, from the parts being more immediately exposed to its action. This is farther corroborated by the means that have been found most successful in removing inflammatory disorders; and as they are always attended with a hardness of the pulse, which is most effectually removed by general bleeding, according to circumstances, combined, in cases of external inflammation, with emollient applications to the part affected.

In all considerable inflammations, t hough at first confined or limited to one part only, yet the affection may be communicated, and become more generally diffused, by affecting the muscular fibres of the whole arterial system, as in fever. In the case of phlegmon or boil, where the action of the arterties is limited, and confined to one part, by propelling the blood into the smaller sets of vessels, where the red globules and other grosser parts of the blood become accumulated, and which they cannot easily transmit; hence we readily account for the redness, tumour, tension, and throbbing pain, that occur in such cases.

We have already observed that diffused or general inflammation seems to procced from an increased action of the heart and arteries, by which the blood is propelled with increased force through the vessels, accompanied with spasm and constriction of the small vessels,

vessels, and an increase of heat, &c. This general inflammation prevailing in the system, produces what is called inflammatory fever, which is more or less rapid in its progress according to circumstances in the habit of the patient, and terminates sooner in death, or, as sometimes happens, proves a salutary effort of nature to throw off something noxious from the constitution. Yet in most cases, from the treatment hitherto observed in common practice, this species of fever proves fatal, and few cases have occurred in horses where the constitution could have been said to be mended by it.

In local inflammation, the vessels of that part only are affected, but if seated in some principal organ of great extent and importance in the system, it may spread and extend to other organs; hence a degree of general or diffused inflammation may take place;

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at the same time it is necessary to observe that there is something peculiar in the inflammatory diseases of horses, and more particularly in the above species of fever, which distinguishes them from similar affections in the human body, and which, in some measure, is owing to the great strength of the muscular coats of the arteries in this animal. Hence all extensive inflammatory diseases in our patients are so rapid in their progress, and soon come to a termination in one shape or another.

The disease of inflammation acquires different appellations, or names, according to the different parts it affects. Thus in the cellular substance, it is termed *Phlegmon*; on the skin, and those cavities which are lined by it, *Erysipelas*; where mucus is secreted, *Inflammation of the mucous membrane*; and so on of other parts.

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We have observed that the term phlegmon or boil is commonly applied to a circumscribed tumor, attended with great heat, tension, and throbbing pain in the parts: when these are slight, and the part affected of no great extent, they hardly affect the general system. But, when considerable and the inflammation extensive, fever and all its symptoms may take place: If by an effort of nature, or from the application of proper remedies, the feverish symptoms together with the tumor disappear, this may be considered as the most desirable mode of termination of this disorder, and is termed *Resolution*.

But if all the above symptoms should increase, and the tumor gradually acquiring a larger size, turning soft and prominent in the middle, or tending towards a depending part, appearing less painful when touched, the feverish symptoms abating, and a fluid found fluctuating under the ſkin, it may then be concluded that matter or pus is formed. This is another mode or manner in which inflammation terminates, and is called *Suppuration.*

If the febrile ſymptoms continue, with pain and tenſion of the tumor rather on the increaſe, while, at the ſame time, there is little or no change on it in point of ſize, the pulſe rather ſinking, there is then great reaſon to ſuſpect, that a gangrene, or mortification, will ſoon take place; the conſequences of which, in this ſituation, will be uncertain, although, at the ſame time, we have no heſitation in pronouncing what the conſequences would be, when a mortification takes place in any of the internal organs, the death of the patient muſt follow of courſe.

External mortification in the parts are not ſo readily diſtinguſhed in our patients,

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on account of the hair and colour of the ſkin, nevertheleſs there are several ſymptoms denoting the approach of mortification which may be depended on. The tumor turns flaccid, loſes its tenſeneſs or hardneſs, a number of ſmall veſicles, containing a thin acrid ſerum, are diſperſed over its ſurface, the parts become inſenſible when preſſed, the pulſe ſinks, but continues to be frequent, and, if the tumor has either broke of itſelf, or been opened, its internal ſurface, in place of being of a bright red, will become of a dark leaden colour, or quite black. If the tumor is of ſmall extent, the mortified parts ſeparate from the ſound and fall off, or they come away with the dreſſings, and the patient may recover the uſe of the part. But if the ſwelling and tumor is extenſive, although death ſhould not follow, yet the great loſs of ſubſtance that enſues, in ſuch caſes, can never be filled up, the parts will be much disfigured, and perhaps the animal lame for life.

In

In phlegmonous inflammation, we ſometimes obſerve an uncommon moiſture or diſcharge of lymph, or ſerum, on the ſurface of the parts, like to a profuſe ſweat. This is another mode in which inflammation terminates, and is called Effuſion. Thus it frequently happens, that in inflammation of the lungs, when the cellular texture only is affected, that it terminates by effuſion; but if a greater effuſion of ſerum takes place than the abſorbents can take up, it lays the foundation for an hydrothorax or dropſy in the breaſt. When the mucous membranes are inflamed, as in recent colds affecting the head, the effuſion from the noſtrils is at firſt thin and watery, but afterwards it becomes thicker, more purulent, and the diſorder goes off.

Eryſipelatous inflammation is not eaſily diſtinguiſhed in horſes on account of the hair and colour of the ſkin; but the extreme pain and ſenſibility of the affected part,

part, when handled, together with the ſuddenneſs of its attack, the great extent of the ſwelling, and its rapid ſpreading in almoſt every direction, evidently ſhows its inflammatory diſpoſition, and points out the neceſity of applying the ſpeedieſt means for relieving the patient. As it commonly begins its attack on the upper parts of the extremities both before and behind, it ſoon affects the trunk of the body; and if it ſhould take its courſe towards the head, it ſwells to an enormous ſize; and, affecting the throat, threatens immediate ſuffocation. All theſe appearances we have ſeen take place in the courſe of a few hours. Country people term it a *weed* or *wyde*, others ſuppoſe it to originate from the bite of poiſonous animals; but caſes of this kind have occurred ſo frequently, in all ſeaſons and in all ſituations where horſes are kept, and that where no poiſonous animal could be ſuſpected to be concerned. Horſes moſt liable to this diſorder are thoſe of groſs habits, who generally are great or what is

called

called foul feeders. The above diſorder may be eaſily diſtinguiſhed from anaſarcous ſwellings, as the latter are much ſlower in their progreſs.

We have obſerved that inflammation, in any part of the body, may be communicated to another or more diſtant part. This frequently takes place naturally; but, at the ſame time, it may be brought about artificially. This may be ſaid to be another mode of termination of inflammation, and is called *Metaſtaſis*, which is the transferring or tranſlating a diſeaſe from one part to another. Thus inflammation in one organ, although not immediately connected with another, as in the convolutions of the inteſtines, whoſe ſurface touches a variety of other organs, and by being in contact with them, from proximity of ſituation, they become ſuſceptible of the inflammation to a greater degree than the part that was at firſt affected; and hence the original inflammation is removed or changes its ſituation to that of another organ.

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By an artificial metaftafis, we remove the original inflammation from its firft fituation to another more favourable for our purpofe of curing it. Thus for inftance, in an inflammation of the lungs, we can raife a very active inflammation externally on the fides of the cheft, or breaft, by the application of irritating fubftances, as blifters, rowels, or even the actual cautery, if neceffary; by which means the original inflammation is transferred from one of the moft effential organs to life to others of lefs importance.

Upon the fame principles, and by the fame means, we can transfer violent inflammations from the head, eyes, and throat, by raifing active inflammation externally on the breaft or brifket.

With refpect to the cure of inflammatory difeafes, efpecially thofe on the external furface of the body, where large or

weighty

weighty dreffings become neceffary, we labour under many difadvantages in our patients, from their reftleffnefs and untractablenefs, and from the difficulty of keeping fuch dreffings on the parts for the length of time that may be required. It is eafy to prefcribe, in fuch cafes, but the great difficulty is to get the prefcription properly applied with perfeverance for any length of time.

The different modes in which inflammation generally terminates has been already mentioned, viz. refolution, effufion, fuppuration, gangrene or mortification and metaftafis. The cure of external inflammation, when of no great extent, arifing from injuries, as contufions or bruifes when recent, may, at firft, be attempted by what is called the repelling method, that is by refolution, which is the fafeft and fpeedieft method of cure, and this is done by topical remedies.

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But, in cafes of wounds or punctures, before this fhould be attempted, every extraneous fubftance fhould be removed, or fuch exciting caufes of the diforder as may prefent themfelves, or appear to have had the leaft tendency in keeping up the inflammation, fuch as foreign bodies in either wounds or punctures. Thus from a prick of a nail in fhoeing, if the nail fhould fplit, which often happens, or the fmalleft fragment of it remain in the wound, the irritation it occafions will keep up the inflammation; and which, continually increafing, will in the end, from its confined fituation within the hoof, bring on fuch a train of complicated diforder as will either kill the patient, or, if he fhould furvive, render him ufelefs and lame for life.

When, therefore, the cure of flight external inflammation is attempted by refolution, thofe applications which are of a fedative or cooling nature are chiefly to be depended on, as vegetable acids, and the different preparations of lead diſſolved in vinegar, as ſugar of lead, or that ſolution of lead commonly known by the name of Goulard's extract : this may be applied either in a liquid ſtate, cold, or by wetting cloaths in it, laid on the parts or uſed as the baſe of a cataplaſm or poultice made with ſome farinaceous ſubſtance where it can be applied, and frequently repeated. In many caſes, where the ſkin is ruffled, emollients may be uſed with advantage, as expreſſed oils, which are of a mild bland nature, made into ointments or linaments of ſoft conſiſtencies, by the addition of a ſmall portion of pure wax. But as oily, or greaſy ſubſtances of every kind, tends to blunt the action of the preparations of lead, ſuch remedies ought never to be applied at one and the ſame time : Whilſt the above remedies are uſed, bleeding, as near the affected part as poſſible, will be of great uſe, and indeed ought never to be omitted.

But, on the other hand, if the ſymptoms formerly mentioned, which attend inflammatory ſwellings, continue upon the increaſe, and a tumour ſeems forming on the parts, we may conclude, with certainty, that ſuppuration will take place, and that the repelling method obſerved above by reſolution muſt be laid aſide: we are then to endeavour to aſſiſt nature as much as poſſible in bringing the tumour to maturity by the formation of pus or matter. In ſuch caſes, all evacuations, whether by medicine or blood-letting, ought to be avoided farther than what may be thought neceſſary in violent caſes of moderating febrile ſymptoms that may occur; for if the ſyſtem is too much reduced by evacuations, the ſuppuration will be the ſlower in its progreſs, and more uncertain in its iſſue, although, at the ſame time, much depends on the ſeat of the tumour; as ſome parts are more apt to terminate in a ſpeedy ſuppuration than

than others, according to their nearneſs or remoteneſs from the heart, their being ſituated in more ſoft cellular parts, or in thoſe which are tough and membranous. Hence inflammatory diſorders in the legs are more ſlow in proceeding to ſuppurat-tion than in the trunk of the body and head. Inflammatory ſwellings about the throat and jaws, as in the ſtrangles in horſes, very ſoon come to ſuppuration, as matter is ſoon found to fluctuate in the tumour; but in ſome caſes owing to the great thickneſs of the ſkin, which frequently prevents its exit outwardly, it forces its way into the cavities of the head, and is diſcharged by the noſtrils.

Suppuration, by which is to be underſtood that proceſs in nature by which the contents of tumours or ulcers are converted into a whitiſh, thick, opaque, and ſomewhat fœtid matter, which, in ſurgical and medical language, is termed *pus*; and although this may be confidered as a natural exertion of the fyftem, yet, in many cafes, it requires the afiftance of art, and in favourable fituations, even in our untractable patients, with due attention we can affift nature in forwarding this procefs, by suitable applications calculated to relax the tenfion of the fibres, and to keep up or preferve a due degree of heat in the inflamed parts.

The means commonly ufed are, warm fomentations, cataplafms or poultices; the latter ought to be frequently repeated in order to keep up that degree of heat which the nature of the cafe requires. When fomentations are ufed, the part affected fhould be well fomented with any warm emollient decoction, applied by means of flannel preffed out of the liquor, in as warm a ftate as the hands of the operator can bear it, and continued for a length of time

together

together by continual ſupplies of warm liquor; covering the parts well up afterwards.

When the tumor ſeems rather indolent, or ſlow in coming to ſuppuration, or the ſkin thought to be too thick on the parts, or when it appears probable that the ſuppuration would be forwarded by ſtimulating applications, to increaſe the inflammatory ſymptoms, bliſter ointment may be rubbed on the part, or, perhaps, the actual cautery, which is more powerful and ſpeedier in its operation, may be applied with advantage.

When matter is fully formed in a tumour, it commonly points at ſome particular part, generally near its middle; and if a fluctuation is obſerved underneath, on preſſure with the finger, the tumour may be opened with a lancet, at the ſametime making a depending orifice. But we ſhall be be more particular on this head when we come to treat of deep feated abfceffes.

Having now treated of the termination of inflammation by refolution, effufion, and fuppuration, it remains to make a few farther remarks on gangrene and mortification.

We have already mentioned the feveral appearances of gangrene externally ; we fhall only now remark, that a thorough mortification of the parts, or what may be called the laft ftage of gangrene, may with certainty be known from the difeafed parts becoming black, foft, and flaccid, lofing all pain and fenfation, and, at the fametime, emitting a very difagreeable fœtid fmell, and followed with an entire diffolution of the different parts of which the organ affected is compofed. When a gangrene takes place internally, efpecially in the lungs, it is attended with fomething of the

fame

fame fœtid cadaverous fmell iffuing from the mouth and nofe in beathing, tainting the whole air in the place where the patient ftands.

Erefiplatous inflammation is obferved moft frequently to terminate in gangrene; and in fome inftances, it is fo very rapid in its progrefs that the difeafe is hardly thoroughly afcertained before fymptoms of mortification appears to have taken place.

The caufe of this fudden tranfition of inflammation and mortification and gangrene may be accounted for in the following manner. In every cafe of inflammation, there is an evident increafed action in the veffels, which propels into the fmaller capillary veffels a greater quantity of the more grofs parts of the blood than they were naturally intended to tranfmit; hence ex-

travafation

travaſation of theſe fluids follow; when theſe are not conſiderable, they are frequently re-abſorbed into the courſe of the circulation; hence the cure is obtained by reſolution; but when an extravaſation of the blood into the cellular ſubſtance takes place to a ſtill greater extent, ſuppuration moſt frequently follows. But if this ſhould not take place, the preternatural heat kept up by the inflammation is ſuppoſed to excite ſomething like to fermentation, which, not being able to affect a thorough ſuppuration, and the craſſamentum of the blood being more liable or more diſpoſed to run into a putreſcent ſtate, mortification, which is a high degree of it, is naturally produced, and all its conſequences follow.

In extenſive mortifications, wherever ſituated, the pulſe ſinks, the natural conſequence of that debility which always takes place in a putreſcent ſtate of the fluids in any diſeaſe, therefore this ſymptom may be always confidered as a characteriftic fymptom of putridity. In the above cafes, the anti-pholgiftic* method formerly recommended in the beginning of internal inflammatory difeafes, muft be laid afide, and a quite contrary method obferved, in order to prevent the fyftem from finking too much ; and this is to be attempted by a proper ufe of cordials, but thefe cordials muft not be of a heating or irritating quality, or fuch as the common cordial drenches, erroneoufly fo called, are compofed of; but to confift of thofe medicines that are of the tonic kind, as the Peruvian bark frequently given in fubftance, which has been often found to have a very powerful effect in putting a ftop to diforders of this kind; and in patients that are confidered of value, volatile alkali, cardiac confection, wine, &c. together with nourifhing food.

There is another mode in which inflammation terminates, and which may be faid to

* See Definitions.

to be peculiar to the horſe, inſtances of which we have frequently ſeen in our practice, where the red globules of the blood, which had been extravaſated during the violence of the diſorder, have been afterwards found lodged in the parts like to dry red powder. This takes place within the hoofs. In corns and in bruiſes, but more eſpecially in that diſorder which is called *Foot Founder**, and which we have always found in the firſt inſtance to be a violent inflammation ſeated within one or both hoofs, and which if not properly treated terminates in incurable lameneſs. In many caſes, we have obſerved the muſcular laminæ, which form the bond of union between it and the laminæ of the hoof, intirely ſeparated eſpecially at the toe or fore

part

* The nature of this disorder we have explained in our Veterinary Prophylaxis, fourth edition, page 143.

part of the coffin-bone, forming a hollow or cavity, into which, after removing a very thin portion of the ſole, a probe as large as a gooſe quill could be introduced a good way up between the coffin-bone and the external hoof; and, in this cavity, the dry red powder above alluded to was always obſerved. The dry corn in the inſide heel of the fore feet, which appears red, or what is called Foxy from its colour, contains more or leſs of this red powder or extravaſated dried blood.

It is now well known that corns of this deſcription originate either from unequal preſſure of the ſhoe, or from the cruſt of the hoof being preſſed from without on the internal ſenſible parts, occaſioned by injudicious ſhoeing, by long caulkers, concave ſhoes, &c. by this means exciting a greater or leſſer degree of inflammation in theſe parts, which produce the above ſymptoms.

In

In the cafe of bruifes, the external fole, when fcraped or pared, appears red on its outer furface, and ftill more fo if pared farther into its fubftance, which evidently demonftrates the extravafation of the red particles of the blood in fuch cafes, and the impoffibility of their ever being re-abforbed again into the courfe of circulation.

From what has been faid on the above fubject, it will appear that, in all extenfive inflammatory cafes in our patients, whether external or internal, no time is to be loft in giving them the moft fpeedy and effectual relief that our art furnifhes us with; for it is not fufficient that we, in many cafes, preferve their lives, but we muft likewife endeavour to preferve their future foundnefs. It ought likewife to be remembered that in all violent inflammatory cafes in horfes, although this inflammatory action in the firſt inſtance may be conſiderable, yet it may and frequently does prove of ſhort duration. The animal powers too often and too ſuddenly ſink with very little or no previous warning, and debility enſues. Hence the neceſſity of watching theſe ſudden changes, and of the veterinary ſurgeon viſiting ſuch patients more frequently than is commonly done.

On the firſt attack of inflammatory caſes, the pulſe is particularly to be attended to, as that is the only criterion to enable us to judge of the ſtate of the circulating ſyſtem, which is always more or leſs affected in ſuch diſorders; and this ought to be our guide in directing us how we are to proceed in our future treatment of theſe complaints.

Horſes that are kept for active exerciſes are ſo thoroughly domeſticated that their mode

mode of life is entirely regulated by art; they are kept up to their full powers by high nourifhing diet, &c. infomuch that they may be faid to live up to the utmoft pitch their powers are capable off; the higher their condition of body and confequent fullnefs of the fyftem, the greater the rifk they run when they are attacked with any internal difeafe, more efpecially thofe of the inflammatory kind, which, if not properly managed, as formerly obferved, on the firft attack, foon change to the putrefcent ftate; hence the vital powers fuddenly fink into a ftate of debility, which terminates in death. But it is not our intention at prefent to enter minutely into a detail of the various difeafes to which horfes are liable, as that ought to form a regular feparate work of itfelf, our plan being limited to the firft lines only of the veterinary art.

END OF VOLUME FIRST.

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