

## **Van Swieten's Commentaries abridged / by Dr. Schomberg.**

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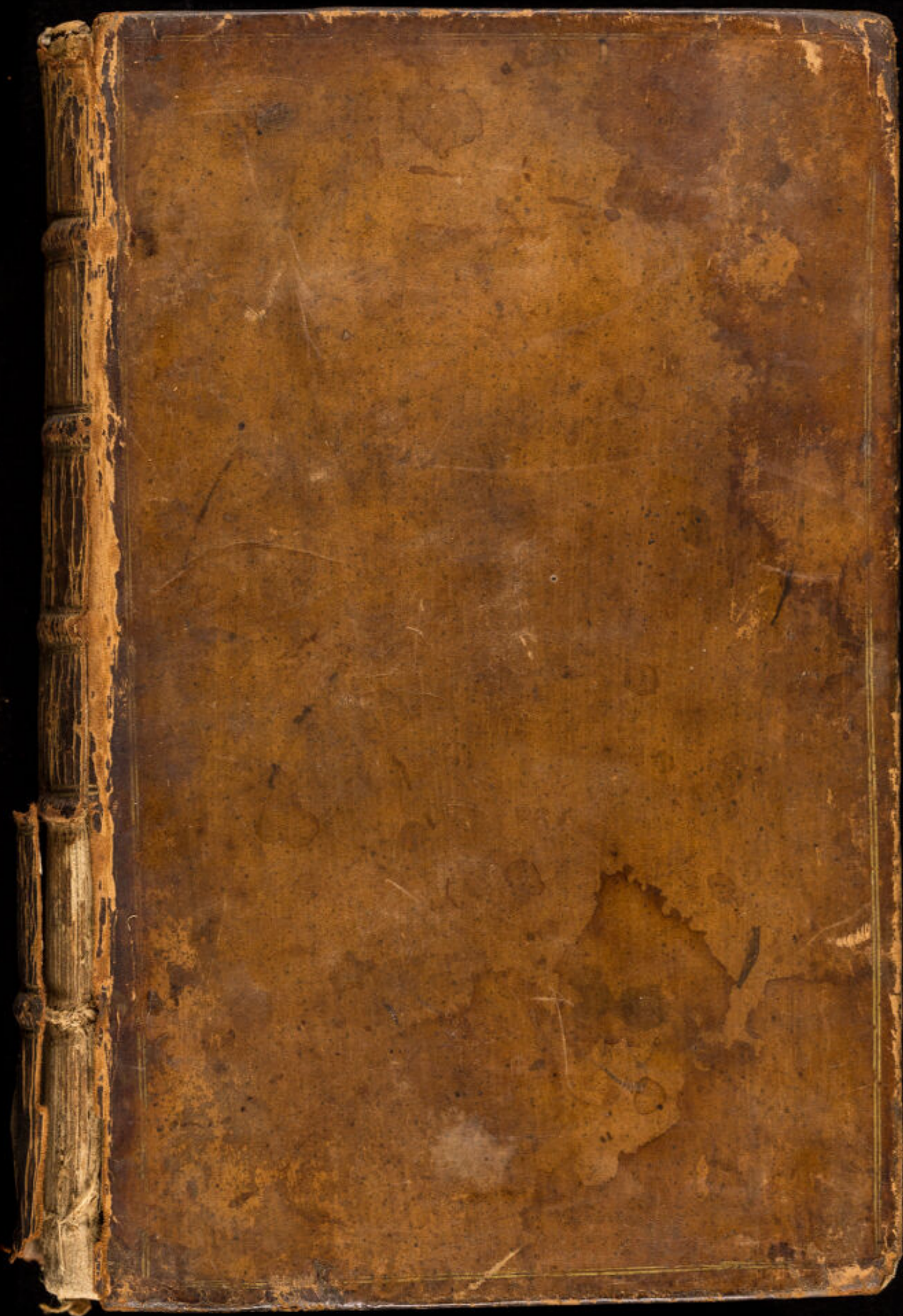
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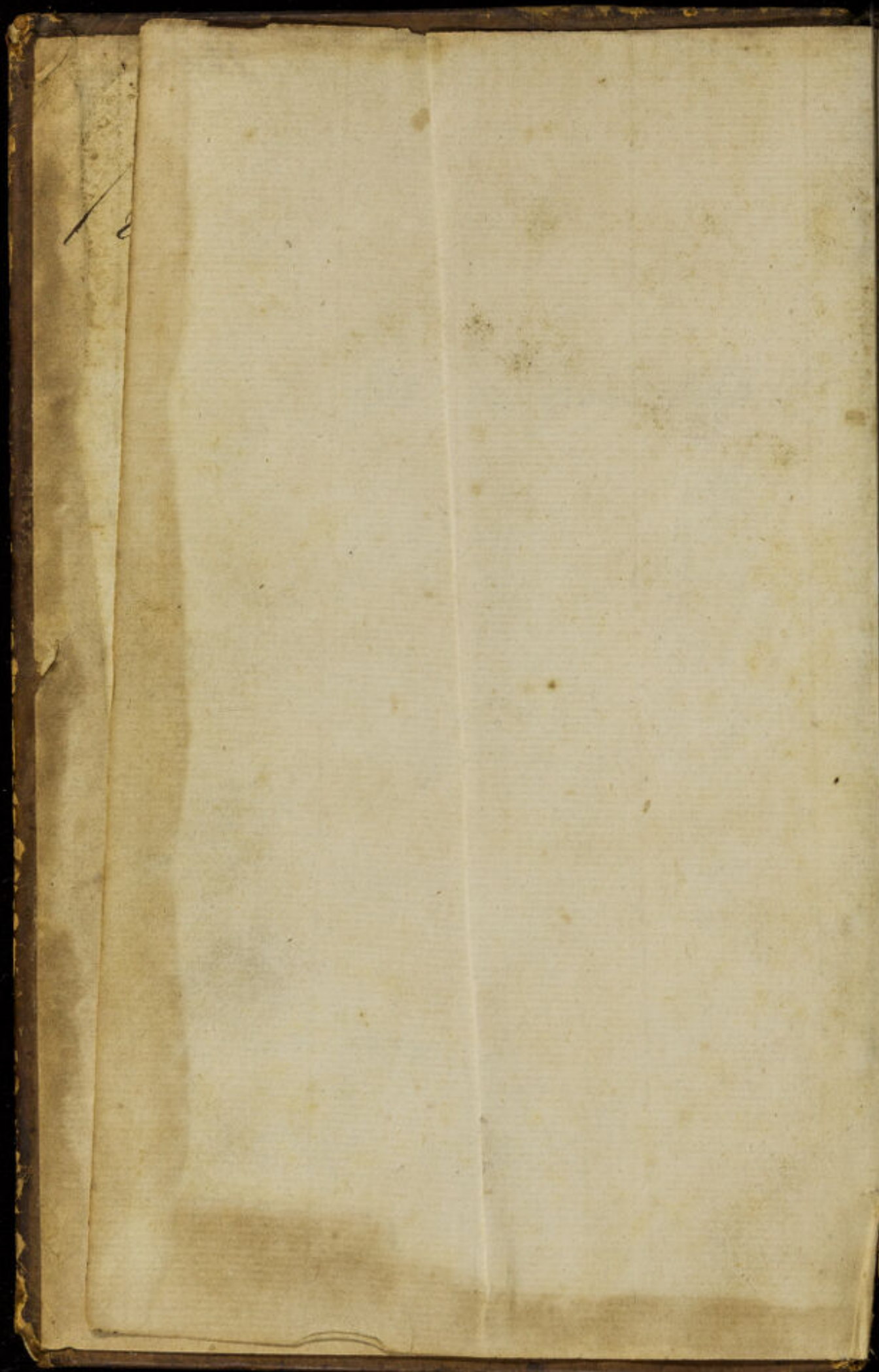
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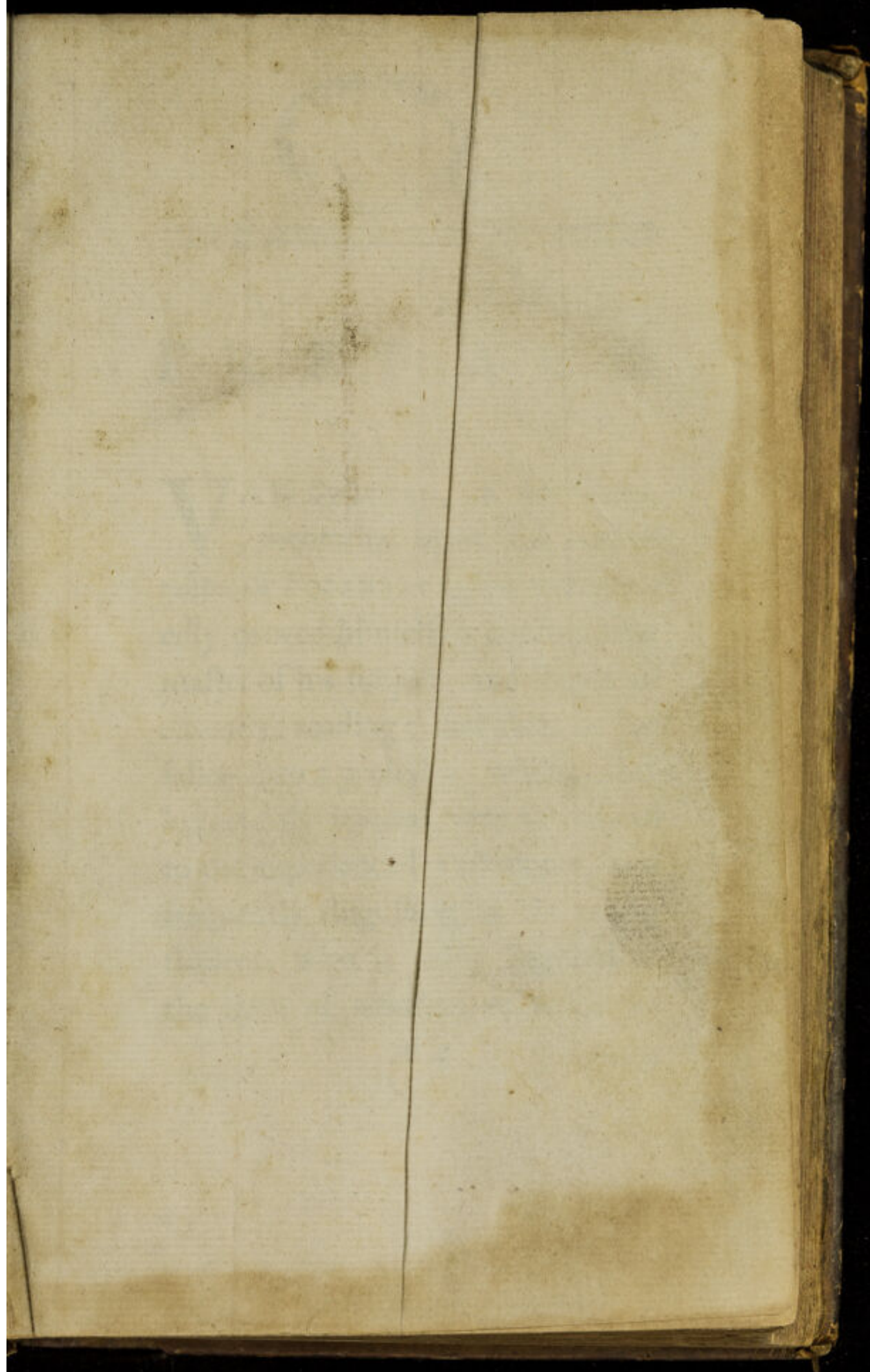
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COMMENTARIES

ABRIDGED

OF THE

STORY OF THE

REIGN OF

CHARLES THE FIRST



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## P R E F A C E.

VAN SWIETEN, in his Commentaries upon the Aphorisms of BOERHAAVE, has undoubtedly proved himself a consummate master of his subject, and shewn an extensive reading; but then he has fallen into a prolixity, which, tho' luxuriantly learned, may be tedious to the experienced practitioner, and frequently disgusting to the young student, who is easily frightened at the sight of voluminous writings:



P R E F A C E.

men, like children, must be sometimes cheated, and imperceptibly led into knowledge: instruction is most impressive, where it is least incumbered.

This consideration induced me to attempt an abridgment: I do not mean, however, to disengage the attention of the studious from pursuing their journey through that field of medical learning; in imitation of the *Spaniards* returning from their first *Indian* conquests, I produce a few rich materials, in order to incite them to a more narrow and close inspection.

It is *eight years* since the learned  
AUTHOR of the Commentaries published



P R E F A C E.

lished his third volume; in the preface to which, he gave us room to hope, the interval between that and his fourth and last volume, would not be as tedious as the preceding ones had been: We are still left in impatient expectation; neither has VAN SWIETEN as yet informed us when we are to be obliged. — This delay called upon me to print the abridgment, which, though *incomplete*, is, however, not *imperfect*: my readers may depend upon having the remainder as soon as the fourth volume comes out, and my avocations will permit me to go on.

Though I confess vanity had some share in my undertaking this  
com-



P R E F A C E.

compendium, it was not that of appearing in the light of an *author*, but of a person who most ardently endeavours and wishes to be of use to the best of his abilities. If I have succeeded in these intentions, my pains will be sufficiently rewarded, if not, I hope I may have leave to say,

*Vitavi denique culpam ;  
Non laudem merui.*

VAN



# ERRATA:

P. 1. l. 3. for *in whom there was nothing amiss*, r. *in whom nothing was deficient*. p. 1. l. 6. for *we undergo so many alterations every day from the change of the air which surrounds us*, r. *for we daily undergo so many alterations from the circumambient air*. p. 1. l. 11. for *in a looser signification*, r. *in a looser sense*. p. 1. l. 12. for *and for this reason, I apprehend, Galen has defined health in this sense*, r. *and this, I apprehend, is Galen's meaning in his definition of health*. p. 3. l. 1. for *the name of the animal functions, &c.* (in the first paragraph) r. *the animal functions are those changes of the human body, which either disturb our ideas, or are disturbed by them*. p. 4. l. 8. for *whereof the privation*, r. *the privation of which*. p. 4. l. 20. for *into a putrid water*, r. *into a putrid colluvies*. p. 7. l. 10. for *effaces all our humanity*, r. *will cause a stupid insensibility*. p. 7. l. 12. for *lose the memory of*, r. *forget*. p. 10. l. 1. for *single observations*, r. *observations only*. p. 15. l. 18. for *approved of in all the ages which passed since*, r. *approved of in all ages since his time*. p. 38. l. 2. for *the first character of humanity*, r. *the first character of human nature, as it were*. p. 64. l. 24. for *obinate*, r. *obstinate*. p. 67. l. 2. for *give pills*, r. *given in pills*. p. 67. l. 15. for *putrid water*, r. *putrid colluvies*. p. 70. l. 7. for *beset with a thin liquor*, r. *besmeared with a thin liquor*. p. 86. l. 22. for *situation*, r. *situation*. p. 101. l. 2. for *whether any thing of putrefaction is confined*, r. *whether any thing putrid be confined*. p. 112. l. 6. for *a*, r. *an*. p. 139. l. 21. for *ædema cal-* r. *ædema ca-* p. 161. l. 1. for *drawing out*, r. *extracting*. p. 178. l. 25. dele *puff-ball*. p. 178. l. 26. dele *fungus*. p. 171. l. 1. dele *fungus*. p. 211. l. 5. for *peat*, r. *pent*. p. 240. l. 2. for *as discharge*, r. *as they discharge*. p. 265. l. 7. for *coloured note*, r. *colour denote*. p. 295. l. 19. for *the whence*, r. *whence the*.





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T H E

INTRODUCTION.

**I**T would perhaps be a very difficult task to find a man perfectly in health, in whom there was nothing amiss, either in the solids, the fluids, or in the motion of the fluids through the solid canals; for we undergo so many alterations every day from the change of the air which surrounds us, the affections of the mind, the greater tenacity, or larger quantity, of food we take down, &c. that we cannot but in a looser signification, be said to be in health; and, for this reason, I apprehend *Galen* has defined health in this sense. “No person, says he, “can properly speaking be said “to be perfectly in health; but we usual-

B

“ly



## 2 INTRODUCTION.

“ly say such persons are in health, as  
“have no particular complaint, and are  
“able to discharge the common offices  
“of life.”

Now health injured is disease. But for the greater regularity of enquiring into diseases, physicians have reduced the functions of an healthful body into three kinds, which they have named *vital*, *natural*, and *animal*. Those functions are named vital which are absolutely necessary to life, and without which there is no life. The natural functions are all those which are instrumental in repairing the several losses which the body sustains, and making good the several deficiencies both in quantity and quality.

Nature (*φύσις*) the old word used by *Hippocrates*, meant nothing more than the aggregate of all the physical conditions, which are required to that most constant, durable, and, at the same time, active power of moving, wherein life consists.

The



## INTRODUCTION. 3

The name of animal functions is given to all the changes wrought in the body of a living man, which occasion a change in the thoughts of the mind, or are produced by a thinking mind.

The chief end of all knowledge in the art of physic is to restore health to the sick.—Practice is that part of the science of physic which teaches how to find out, by undoubted natural signs in the patient, when there is a disease, what that disease is, in what state, whether in its beginning, increase, height, or declension, and by what method and means this disease now found out may be carried off.

A physician therefore must know what the disease is before he can cure it; for a disease is the disorder of some function requisite to health: how then shall he know what is amiss in this function who is not acquainted with all that is requisite to the due discharge of it?

The first part of the practice of physic takes in the discovery of diseases, the



#### 4 INTRODUCTION.

other teaches how a disease, when found out, may be cured.

But to this cure is required the true knowledge of all that we have mentioned above ; for a cure is such a change of the body, as removes the state which was termed a disease, and restores the state, whereof the privation occasioned the disease.

It would be a reproach to an artist not to know the instruments of his own profession ; and supposing a physician to have clearly discovered what ought to be changed in the body to produce health, yet if he knows not by what means to effect the change, he will do no service.

How is the nature of medicines changed by their various preparations ! The *Syrian Scammony* given pure dissolves the humours into a putrid water, and then carries them off by stool ; yet the same medicine, by being exposed to the vapour of burning sulphur, as in making the *Diagridium Sulphuratum*, is rendered almost inactive.

The



## INTRODUCTION. 5

The root of *Rhubarb* infused in hot water forms an innocent purge for every age and sex; but, by long boiling, loses both its fragrancy and virtue.

A physician ought also to be acquainted with the different methods of using his drugs.—*Resin of Jalap* given alone, and by its tenacity adhering to the folds of the stomach and intestines, has frequently brought on an *hypercatharsis*; but if this quality be corrected by pounding it with a little sugar, or the yolk of an egg, it may then be used with far more safety.

*Hippocrates* used to drop the very acrid juice of *Tythimal* into figs, that it might not injure the throat in its passage.

All medicines, when applied to a living body, are brought into action by life, and frequently produce different, and sometimes opposite, effects, in different subjects, from a particularity of constitution; nor can this ever be determined beforehand, but is only to be learnt from experience.



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The same medicine shall produce a different effect in sickness and in health. The bile exalted by violent summer heats, if irritated by some gentle purge, shall frequently bring on an enormous quantity of stools; whilst six times the dose given to a man in a dropsy shall not occasion a single motion. Five grains of *Mercurius vitæ* given to a woman in a maniacal case wrought no effect; though before she was afflicted with this disease, a few grains of scammony threw her into fainting fits, through the violence of its operation.

In chronical diseases, when the viscera are almost tabid, and ready to fall to pieces, how dangerous is it to give even the mildest vomit of *Ipecacuanha*?

In diseases, nature so often endeavours by unknown means, to expel the latent morbid matter, whether it be the cause of the disease or its effect; that he who would imprudently disturb her in these good beginnings by opposite remedies, must always do mischief.

The



## INTRODUCTION. 7

The whole power of medicine consists in nothing more than making such a change in the body, as to amend the injured action of the mind that is united to it; for it is often a very slight disorder in the body which oversets the whole mind. Thus idiots are always observed to have mishapen heads from the birth. So a single ounce of blood extravasated under the skull effaces all our humanity. A boy of eight years old, during a hot season, used to lose the memory of all that he had learned, but two or three days cooler weather would restore it again, and with the hot weather the same calamity returned.—Innumerable other instances confirm this matter. It is very possible the cause of a disease may be removed, and of course the disease itself, and yet several of the functions may be left depraved by the preceding disease. A man labours, for example, so long under a severe autumnal quartan ague, till by the repetition of the fits, the solids are so weakened, and the fluids so dissolved, that a dropsy en-



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fues. Give him the Peruvian bark, the fever is cured, but the dropfy remains. This, however, will warrant no such conclusion, as that by taking away the cause of the disease you have not taken away the effect; for the Peruvian bark has so subdued the course of the ague, that its effect, the fever, is gone; but the fever has so changed the body as to make it dropfical; and though the fever be removed by the bark, yet those causes remain from whence the dropfy followed as an effect, namely, the too great weakness of the solids and dissolution of the fluids.

We have a two-fold method of removing diseases, either by acting directly on the diseases themselves, without changing the rest of the body, or, by changing the whole body, to destroy and expel the disease.

A quartan ague, which had been treated in vain with purges, vomits, sweats, and which even kept its course in the midst of a salivation, (as I myself have



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have seen) was cured by the Cortex Peruvianus, without producing any other visible change in the body. This therefore we call a peculiar or specific remedy, as, in carrying off the fever, it works no other change in the body. Opium swallowed down, and lying in the stomach, removes all sense of pain, without disturbing the body. A stone falls from the kidney into the pelvis, and thence into the ureter, and thence arises intolerable pain, with convulsions of the lower belly, nausea, vomitings, &c. Now if the physician knew a remedy, by which to dissolve the stone that is lodged there, this would be a present cure; but for want of this he is forced to change the whole body by fomentations, clysters, bleeding, and the most emollient decoctions, that he may expel the enemy through the now relaxed and lubricated passages; and this is called a general cure.

There is no doubt but both medicines and the practice of physic were discovered



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ed by single observations; for the first advances in physic seem to have taken rise from men's advising others in sickness to make use of remedies which they had found beneficial to themselves or others, in hope they might prove successful to them in like manner.

Such causes as jointly make up the proximate cause, are what are termed the pre-disposing causes (*προηγούμεναι*) or (*προκαταρτίζουσαι*) the occasional.

A plethoric person, for instance, after violent muscular motion in a very hot season, by the rupture of an artery in the cerebrum, falls into an apoplexy. The remote pre-disposing cause in this case was the plethora, the occasional causes the heat of the air and the increased impetus of the blood by muscular motion; but neither the heat of the air, nor the muscular motion, would have brought on the apoplexy, if the man had not been plethoric.

The disease, however thus understood in its causes, in the progress of it, is changing



## INTRODUCTION. II

ging the state of the body every moment, and doing still further mischief to the functions, and thus produces, as it were, new diseases, which are called effects of the disease, or *symptoms*: for under this name are comprehended all these preternatural appearances which are seen in the patient from the disease as a cause; yet so as that they may be distinguished from the disease and its proximate cause.

Thus, for example, a man in a pleurisy, through the sharpness of his pain, dares not dilate his breast in order to draw in his breath; by this means the blood passing with difficulty from the right ventricle of the heart, through the lungs, begins to be accumulated there, and forms a peripneumony. This now is a new disease, but springing from the pleurisy as its cause.

The physician observes all that passes during the disease; what does good and what does harm, and then forbids the one and prescribes the other; this is the doctrine of things useful and hurtful, which



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which is of so great account in practice, and which gave the first rise to the art of physic.

Though a physician should have done every thing according to the rules of art, yet ought he carefully to attend the event, and observe whether it does good or not. *Hippocrates* lays down some certain signs, whereby to judge whether a purging medicine that has been taken shall have done service or no: “*If, says he, the humours be voided which ought to be carried off, the patient will be relieved, and easily bear the discharge; but if not, the contrary effect will follow.*”

What will be the idea of the best physician in future times we know not; but he is to be reckoned a good physician now, who makes use of all the assistance by which, through the happiness of the present age, the art of physic has been improved.

When in the beginning of an exact quartan, there comes on that surprising coldness, ascending from the lowest degree



## INTRODUCTION. 13

gree (to sense, like that of a cool air,) to such an extreme rigor as to make the limbs all stiff and inflexible, and frequently to take away all sense, so that the person affected shall burn his legs to the bone without feeling it; with what variety of knowledge does this furnish the physician? for it is demonstrated in physics, that cold is the absence of fire, or its not being determined to a particular place; and from the known laws of the human body, it is now certainly known, that coldness is the effect of a diminished circulation: now in the beginning of a quartan, we evidently find that the circulation is diminished; the heart indeed beats more swiftly, but not being able to overcome the increased resistance, it cannot propel the vital blood to the extremities; these extreme parts therefore first grow pale, the tip of the nose becomes very pale, the nails, and extremities of the fingers, and so the lips. And as the cold contracts all the parts, the veins also being constricted, propel their humours to-  
wards



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wards the right ventricle of the heart with the greater force; the left ventricle of the heart, in the mean time, is not able to throw out the whole quantity of blood contained in its cavity, into the contracted arteries, by which means the blood is accumulated about the heart and lungs, and occasions that astonishing uneasiness, panting, and struggling, by all the force of respiration to throw off the oppressing load. Hence we conclude, that there is at this time great danger of death, and reason to fear, lest the blood, which almost stagnates in the larger veins, should run into polypous concretions, which are often not to be dissolved again during the remains of life.

He therefore is not to be esteemed a good physician, who only takes notice of the phænomena of diseases; but he that weighs them, and is able to point out what are the necessary consequences following from them.

Nor yet is this sufficient; but it is farther requisite *that he compare them all*  
with



# INTRODUCTION. 15

*with each other* : for the extreme cold of a quartan will be followed by a heat gradually increasing, till it comes to be extreme : but heat distends, lengthens all the solids, and increases the bulk of the fluids : the solid fibres therefore, which were shortened by the preceding cold, will be lengthened by the subsequent heat ; but nothing weakens the frame of the solids more than this alternate change of contraction and relaxation : hence it is we so often see so great a debility following after a stubborn quartan ague, and the many other evils subsequent upon it.

The wise *Hippocrates*, in his *Prognostics*, has deduced presages which have been approved of in all the ages which have passed since : he there directs us to consider well the *face* of the sick, whether it be like that of a person in health, but especially if it be like what it formerly was ; and says the worst state of it is, when it is diametrically opposite to an healthful countenance ; when the *nose is sharp*,



*sharp*, the *eyes hollow*, &c. describing that kind of countenance which has been since called by physicians the *facies hippocratica*. He compares the manner how his patients lie in bed with their usual custom of lying when in health, and so far condemns the former as it departs from the latter; so he condemns a quick answer from a man that had been of a cool temper before, &c.

All those appearances in a disease, where it is known to be different from a state of health, are called *symptoms*: now these are *individual* and *proper*, and constantly occur in every description of the same disease, and can never be separated from it: thus for instance, in a pleurisy, the *sharp pricking pain*, which is felt more violently upon drawing in the breath, attended with an *acute continual fever*—these are called *pathognomonic* signs: besides these, there are such as are common to this disease, with many others; thus, in a pleurisy, the pains of the head, loins, &c. which do also occur  
in



in a thousand other diseases, are therefore called common. Now all these are to be set down in their proper order, as they mutually succeed each other, otherwise the end of the description is lost: thus to say, that in the small-pox the patient was delirious, would be to say nothing from whence any certain presage could be formed; for there is a wide difference, whether the delirium comes on before or after the eruption. If physicians in former times had not observed this, how could they have foretold what would happen on the *seventh day*, from what appeared on the *fourth*?

*Hippocrates* says, "*Past things must be learnt, present known, and things future be foretold.*"



INTRODUCTION

in a thousand other diseases, and the  
called common. Now all the nature of  
the spirit in this paper, as the  
naturally forced, and other  
the end of the book is to tell: that  
to say, that in the small part of the  
Diseases of a single joint, having  
the most, would be to say nothing  
and as much as the disease could  
be found, for there is a wide distinction  
which the bell has come on before  
of the small part of the nature of the  
of the times had not been with other  
could have been the part of the  
not double in the part of the  
nature of the nature, it is a combining  
tion of the elementary nature, the nature  
nature, a part. The solid part of the  
nature, the part deprived of all the  
more volatile parts by a chemical ana-  
lysis, yield an earth. — Extraction  
shows this, which partially separates the  
earth from the other principles. — It is  
this earth which gives stability to the  
principles. — Bones, Calcium, and made  
very brittle, if dipped in oil, will cohere  
again. A certain and determinate de-  
gree of cohesion is required in the fibres,  
which



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DISEASES *of a simple solid Fibre,*  
*and a weak lax Fibre.*

THE most simple fibre consists of very small parts adjoining to each other length ways; these parts, which are not divisible into less, are called the elements of the fibres.—It is a combination of the elementary particles, that constitutes a fibre. The solid parts of animals, after being deprived of all their more volatile parts by a chemical analysis, yield an earth.—Putrefaction shews this, which perfectly separates the earth from the other principles.—It is this earth which gives stability to these principles.—Bones calcined and made very brittle, if dipped in oil, will cohere again. A certain and determinate degree of cohesion is required in the fibres,



which if encreased or diminished will constitute a disease. We are always to consider whether the disease is to be left to nature, or whether any assistance is to be given by art.

If a pleuritic person in the first stage of the disease coughs up a mucous yellow matter streaked with blood, and finds relief in every symptom, we know from the faithful observations of the ancients, that if this expectoration can be kept up, he will be well in a few days; for which reason we are not to disturb this salutary attempt of nature, by bleeding, or any other remedy; but are only to throw in such very smooth decoctions as may serve to support this expurgation. But if, in a pleuritic patient, we observe a violent fever, a burning heat, or dry cough, attended with a dryness of the tongue, and no sign appears from whence we may learn that nature is aiming at any salutary change, we then know, that if things go on in the body as they do, either a mortal gangrene will follow, or if the disease  
be



be of a milder nature, a suppuration; which is *always a good circumstance where the suppurated matter can be discharged outwardly*; there would be danger otherwise, that the purulent matter, when formed, would be discharged into the cavity of the thorax, and destroy the patient with a fatal *empyema*: here then we conclude that nature is not to be left to herself, but the disease is to be so changed by the powerful assistance of art, as to prevent either a suppuration or a gangrene.

Gentle friction presses the veins only, whereas a stronger presses also the arteries. By pressing the veins, it accelerates the motion of the venal blood towards the heart, and by this means the motion of the heart is quickened, and of course the blood is propelled with a greater velocity through all the vessels.

A weak man should not ride on a full stomach; but either before dinner, or after the digestion is finished.

The more a fibre is distended, the more it is weakened; whatever therefore



hinders the stretching out of the fibre, removes the cause which weakens it. Now bandages or cloths drawn tight to the body, supply the vessels with that support, which the solids were too weak to do; that is, they hinder the too great dilatation. The cure of some diseases should be promoted more by means of bandages than by all other methods whatsoever.

I remember I once had under my care a young lady of distinction the most violently relaxed in her nerves I had ever attended. The least noise, or the letting in upon her too strong a light, would immediately throw her into convulsions; the abdomen at the same time being drawn into a variety of strange motions, and feeling as if it were tearing asunder. Neither the ferulacious juices, nor the powerful virtue of *castor*, so serviceable in nervous complaints, were here of benefit; but when her legs, thighs, and the whole abdomen, were bound round with proper bandages, this troublesome disorder presently abated, and then by the use  
of



of proper remedies she recovered. Thus she lived for several months, wrapped up like an Egyptian mummy, and by no means to her dissatisfaction, as she presently found so much relief from the application. We ought to use the utmost caution in giving fermented spirits; for they are capable of producing abundance of mischief, both as they inspissate the liquids, and contract the solids, if used imprudently. In the dead body of a woman addicted to dram-drinking, the spleen, pancreas, liver, lungs, were all found dry, scirrhus, and in a manner partly petrified; all the glands, internal and external, were become nearly as hard as stones.

Steel dissolved in the milder acids is commonly preferred to all others, because it acts not only by its austere astringent virtue, but because by the wonderful stimulus of its metallic sulphur, which is so friendly to our nature, it raises the vital powers.



24 *Diseases of weak and lax Viscera.*

The strength of the greater vessels arises from three causes— 1. From the strength of the fibres — 2. From the collapsed or compressed vessels growing together into membranes.— 3. From the vessels concreting with the liquids they have contained.

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*Diseases of weak and lax Viscera.*

**A** Viscus, or bowel, is commonly defined to be an organical part of the body, which by its structure very much changes the humours brought to it, and so as to make this change subservient to the life and health of the whole body.

There are two causes which produce the motion of our liquids through the canals. 1. The power of the heart distending the vessels by the blood impelled into them. 2. The strength and contractility of the vessels; which when the motion of the heart ceases, propel the  
the



the blood that was thrown into them by the heart; when therefore this contractility of the vessels is deficient, the liquids stagnate.

*Hippocrates* observes, "*that what is done by degrees is safe at all times, but especially when the transition is from any one state to a state quite different.*" This general rule is more especially to be observed in the cure of weak vessels and viscera. Should any one in this case imprudently accelerate too much the motion of the humours, through the vessels, either by stimulating medicines, or an increase of the muscular motion, the too weak vessels and viscera would generally break, as unable to sustain the additional force; and, instead of relief, death would be the consequence, through the wretched mistake of the physician.

Exercise of different kinds are serviceable, because, 1. As the pendulous viscera receive strength from these agitations, (from swinging on a rope with a slow oscillatory motion, a litter, chaise, coach,



26 *Diseases of weak and lax Viscera.*

coach, or riding on horseback,) and the several concretions formed in the humours are partly broken by the concussions and partly by the encreased powers of the vessels and viscera. 2. As the remaining fæces of the last digestion are hereby discharged from the *primæ viæ* in such persons, as would otherwise retain them, through want of power in these viscera to discharge them; for which reason exercise is particularly adviseable, an hour or two before a meal: 3. As the force and efficacy of the air on the vessels of the lungs is hereby increased, and the surrounding atmosphere, which presently grows warm with the heat of the body, is continually renewed; which more especially is obtained by riding on horseback.

*Diseases*



*Diseases of too strong and rigid Viscera.*

ALL the new liquids that pass into the body enter always by the veins, whether they are conveyed through the mouth in our meat and drink, or are drawn in by the absorbent vessels, which are spread over the whole surface of our body; as the veins easily dilate and admit them all. But when they have passed from these into the arteries, if these arteries are stronger than is required to health, the introduced liquids are presently carried off. For which reason we plainly see, why lean and strong men oftentimes eat more than twice as much as fat and idle men, and though they have but few stools, do notwithstanding not grow fat. The food they take indeed enter the lacteal veins, and is thence conveyed to the *vena cava*, and the right ventricle of the heart, but is so attenuated in passing through the pulmonary arteries, and afterwards through the whole



whole arterial system, as to be presently carried off by the perspiring vessels, and so vanishes into nothing. It is carefully to be observed, that though the power of the arteries be encreased, yet they do not therefore presently bring on a greater resistance to the heart than is requisite: for the strength of the heart encreases with that of the artery, as the influx of the venal blood into the cavities of the heart, the circulation of the arterial blood through its substance, the influx of the spirits into its muscular villi, are the causes upon which its muscular motion depends. But when the *aorta* contracts itself with greater force, it drives the blood more swiftly through the coronary arteries into the substance of the heart, whereby it applies the blood with more power to the *cerebrum* and *cerebellum* by the carotid and vertebral arteries; from whence follows a larger secretion of spirits; and consequently it encreases the velocity of the blood flowing from the arteries into the veins, and by this encreased



encreased velocity occasions a greater irritation of the heart. So that all the causes of the muscular motion of the heart are encreased by the strength of the arteries. While this equilibrium continues, the food is most perfectly and speedily converted into our nature, a great degree of solidity is given to the blood, and as yet no detriment done to health: but when the strength of the arteries increases so far as that they are scarcely to be dilated, then follows all the mischief.

There is but little hope of curing a confirmed polypus. There are many remedies cried up as effectual, but very seldom do good. All that can be hoped for is to dilute the blood, and so throw it into a state most remote from concretion; *i. e.* to introduce by art that cacochymy which consists in the blood's being too thin, to the end the polypus may not be encreased by the opposition of new matter, but by degrees be worn away, by the constant attrition of the blood, which is every moment passing by it.



30 *Of too strong and rigid Viscera.*

The blood of a healthy man always exceeds the density of water, and if it begin to degenerate into the thinness of water, his strength decays, as we see in hydropical patients.

Emollients are of the same class with lenients, except that these relate to the solids only,—lenients to both solids and fluids. Watery diluents resolve all mucous, glutinous, gummy, soapy concretions, and yet many others are not to be resolved by water; blood is not to be kept from coagulating by being put into warm water.

In the earliest part of life a man is most liable to all the diseases of the nervous kind; because, as we learn from observation, the brain and its productions, *i. e.* the *medulla spinalis*, and the nerves, are larger in proportion to the rest of the body the nearer a man is to his original. Add to this, that as the brain is less firm at that age, the nerves, which are produced from the brain, are softer and more easily affected, besides that



that the integuments are thinner ; hence it is, that children are so apt to fall into convulsions, for a child can scarce have the slightest fever, but it is attended with a convulsion.

Another source of diseases in the tender age of children, is the quantity of humours being more than proportioned to the powers of the solids. In our infancy we are all disposed to be turgid and moist ; and from hence arises those easy and wonderful changes of the cutaneous humours, which so frequently show themselves, in a manner as yet not well understood. This appears in the ulcers of the head, the herpes, the excoriations behind the ears, the armpits, &c.

Afterward, about the time of puberty, the whole body suffers wonderful changes in both sexes ; in the male, tumours of the testicles, varicous inflations of the feminal vessels, which are easily cured by gentle friction, whilst exposed to the vapour of lighted amber, and at  
the



the same time giving lenient purges.—  
In the female, surprizing diseases do  
often both precede and attend the first  
eruption of the menstruous flux.

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*Spontaneous Diseases from an acid Humour,  
and Diseases from a spontaneous Gluten.*

**A**N acid is foreign to the body ; for  
no animal humour, properly so  
called, ever grows acid of itself.

The cause why flatulency arises from  
an acid is twofold ; from the irritation,  
by which the fibres of the intestines be-  
ing drawn into a spasm, keep in the in-  
cluded air ; and from the elastic matter,  
which is generated in all liquids that are  
apt to ferment ; on both which occasions  
those who suffer under an acid are so sub-  
ject to flatulencies. Of all the humours  
that are not excrementitious, the bile is  
the most acrid, and soonest liable to pu-  
trefy ; and for this reason it is, that dead  
bodies soonest putrefy near the liver.

All



All persons that have a predominant acid look pale. This shews a deficiency of the most solid red part of the blood; and where this fails, the assimilation of the crude humours is never carried on so well as it ought to be, and they more easily degenerate into a spontaneous corruption. All sharp humours, when they arrive at the skin, will occasion itchings, obstructions between the scales of the skin, pustules, &c. In the jaundice the bile, when carried to the surface of the body, shall often raise an intolerable itching. If the humours, infected with an acid acrimony, flow to the same part, the same effect will be produced. By eating unripe and crabbed fruits, the children of country-people often labour under diseases of the skin, attended with a most violent itching. In the first stage of life infants are often afflicted with surprising erosions of the skin.

No animal tends to acidity of itself, but always to putrefaction.

D

A glu-



A glutinous substance is, as it were, of a femiliquid nature, but has such a lentor in its parts, that when moved they, in a manner, still stick close together.

The internal surface of the windpipe and bronchial vessels is entirely overspread with a very smooth mucus, which covers and defends the nerves that are there dispersed, and are so apt to be affected by the least irritation; but in an healthy young person, that breathes well, and is active, this mucus is dissipated after it has done its office; or, collecting in a larger quantity after sleep, is easily thrown off by a little coughing and hawking. And yet in old men this mucus is gradually collected, and grows sluggish and viscid, and incapable of being thrown off by the weak action of their lungs and still weaker action of their sides; so that it occasions a *stertor* and hissing noise in the part of the lungs where the air is lodged, till at length, with much coughing and difficulty, it is brought up. From the constant supply of this mucus, arising  
from



and, from a spontaneous Gluten. 35

from the diminution of the concoctive powers of the lungs, the greater dilatation of its vessels, and relaxation of the mucous cells, proceeds that asthmatick cough incident to old men. "Hoarseness and colds in old men do not pass regularly off," says *Hippocrates*. For which reason, whatever is of use to attenuate this viscid mucous matter, and at the same time revive the languid powers, is in this case more particularly serviceable to old men. For such a collection of mucus is not only to be found in the lungs, but in the stomach and intestines, and even in the bladder; for which reason old men so frequently make a pituitous urine. Weak people, when dining upon mealy substances not well fermented, find themselves subject to a difficulty of breathing within a few hours after, from the viscid chyle's passing with greater trouble thro' the lungs.

All secretions are made from the blood :  
in order therefore that these be duly

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per-



performed, it is necessary that the blood should be good.

It is a vain attempt to cure a person labouring under a pituitous indisposition by food and phyfic, unless you can prevail upon him to cast off that sluggishness which is natural to this disease, and to use exercise even almost beyond his strength. And yet the motion must not be too violent at first, lest this mucous matter should be thereby thrown upon the lungs, which could not happen without very great danger: this often happens, when the glutinous matter collected in the winter is suddenly liquified by the heat of the spring; and, mixing with the blood, is stopped in its passage thro' the very minute vessels of the lungs, by which means the patient is suffocated at once; but the motion must be gentle in the beginning, and increased by degrees; and if the body is too weak to use exercise, friction should be substituted in its room.



*and, from a spontaneous Gluten.* 37

The effect of stimulents does not always depend upon the figure, weight, and stiffness of their particles; and it suffices, for the physician's purpose, that he knows what particulars, applied to the body, shall increase its motion, though he does not know the manner whereby they act.

Children whose bellies swell thro' these glutinous obstructions, are generally relieved by having them rubbed with rough cloths; this should be done in a morning after sleep, and fasting; for when the stomach is full, they cannot easily bear it.

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*The Diseases from a spontaneous alkaline Cause.*

OF all the liquids of the body in health, except such as are excrementitious, the *bile* is the most acrid, and soonest inclines to putrefaction.-----

When mixed with the chyle in the duo-

D 3

denum,



*denum*, it impresses upon the food, what may be called the first character of humanity, and changes the acid or acedent part of it into an opposite nature.-----If this bile either exceeds in quantity, or begins to putrefy, it brings on an universal corruption, and gives rise to the most acute putrefying diseases.

The want of motion in our fluids, or an excess of motion in them, will both produce putrefaction; and thus two directly opposite causes will produce the same effect.

Thirst is the constant attendant upon any putrid fomes in the human body. This appears evidently in hydropical persons, who are seldom thirsty in the beginning of the distemper, but as soon as the water begins to stagnate and corrupt, and to continue long in the body, then follows an unquenchable thirst. *Hippocrates*, for this reason, reckons the want of thirst a very promising symptom.

Every kind of acrimony may irritate the nerves dispersed through the intestines,



tines, from whence may follow their spasmodic contraction and inflammation; especially when, by the soapy virtue of the acrid bilious matter, the mucus is abraded that defends the very fine extremities of the nerves, which are spread over the internal coat of the intestines, and causes them to become much more sensible.

A cohesion in our humours seems necessary for the nourishment of the body; but this is destroyed by putrefaction. In diseases arising from some putrid matter lying in the body, all the humours are dissolved, nutrition fails, and the patient dies of a slow consumption. This is evident in phthysical cases, where the night-sweats, the colliquative and putrid diarrhœa, atrophy, and death, arise from the blood's being too much dissolved.

In very acute fevers the quick and difficult respiration, the very swift, and oftentimes unequal pulse, shew plainly that the *vital* functions are disordered; the extreme weakness, delirium, drow-



finess, &c. indicate the same in the *animal* functions; the lost appetite, the thirst, nausea, and vomiting, as plainly point out the disorder of the *natural* functions.

Whatever is acrid may cause an inflammation either in the whole body, or in any particular part, by its stimulus.

The juice of ripe fruits needs no preparation; it allays thirst, cools, relaxes the belly and urinary passages, and affords the greatest relief, when the stomach suffers from a putrid bile. Wine itself is good in these diseases, *even in the most acute*, especially the acid sorts; but then they must be well diluted with water. Vinegar is reckoned by all, among the best prophylactic medicines to keep off the plague, as its smell is so reviving in all putrid diseases.

When there is either a dissolution of the humours from putridity, or there is reason to apprehend it coming on, the acid spirits drawn by fire from *sea salt, nitre,* and *vitriol*, will then be of the greatest service; these most powerfully resist all putre-



trefaction, at the same time not dissolving, but rather coagulating the humours. The spirit of sulphur *per Campanam*, as it is called, is singularly serviceable in this case, being the purest fossile acid, without any metalline substance intermixed with it.

Emulsions and decoctions, by reason of the water they contain, dilute, and by means of the soft oily gluten residing in them they inviscate whatever is acrid, and render it inactive; and therefore are given to advantage.

Medicated earths or boles resist all putrefaction by their latent acid, and are by their innocent mildness extremely demulcent; hence their excellency in putrid dysenteries, if given in a due dose.

They who die of a suppression of urine have all the functions of the brain first disordered, and at length go off quietly in a fatal sleep, though sometimes they are convulsed before the close of the last scene.

The



The strongest broths are perfectly glutinous, and oppress a weak stomach without encreasing strength, but the thinner sorts afford a good nourishment. Calves feet given to phthifical people in decoctions or jellies, with a view to nourish them, frequently do injury, because they oppress their already weakened lungs with too tenacious a chyle.

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*Of the Diseases that arise solely from the excess of the circulatory Motion.*

THERE scarce are any two liquids found so much alike as the serum of the blood and the white of an egg.

The blood of an healthful person is very prone to concretion, and this may be increased by the increase of heat: this blood thus coagulated is not easily solveable.

Whatever causes the venal blood to move more swiftly towards the heart, increases the motion of the heart; hence  
it



it appears, how a very high fever may be raised by too violent muscular motion, or by violent frictions. Who can explain the nature of the stimulating power in a drop of variolous matter, applied in a fresh incision made by inoculation? or, who will point out to us the manner how sound humours changed by the variolous contagion, shall assume a poisonous nature, and, at the same time, acquire almost an infinite power of multiplying the poison?

An increased motion of the blood arises from the more frequent and violent contractions of the heart. The dilatation of the arteries must be increased in a proportion compounded of the increased strength and frequency of those contractions, the arteries, when they are distended, are in a violent state; and hence their sides endeavour to approach nearer to their axis, by their elasticity and muscular action, and so repress the distending blood; for, unless the arteries, by being



ing contracted through their own spring, were to expel the blood which distends them, the heart would not be able, the next systole, to throw the blood contained in its cavities into the arteries that are already distended; the blood would consequently by degrees be accumulated within its cavities, and the circulation stopped. The stronger therefore the action of the heart is, which distends the arteries, the greater will be the power of that force by which the arteries endeavour to contract their cavities; and the oftener the heart is contracted in the same space of time, the more frequently will the contracted arteries re-act upon the blood that distends them. Heat arises from the attrition of the parts with each other, and the sides of the vessels. As soon as the blood is at rest, all heat ceases; which encreases again upon motion: this made *Hippocrates* observe, that "the blood is not hot by nature, but grows hot."

The urine, which is the true lixivium of the blood, grows more acrid and fetid,



tid, as the circulation becomes more violent; the motion of the blood being increased, the salts of the blood become more acrid and volatile, and the oils thinner and less mild; these again will form a fresh stimulus to increase the circulation, from the increase whereof they deduced their origin. And thus the effect of a disease will increase the disease itself.

Health seems, in a great measure, to consist in every vessel's containing its own proportional liquid.

The quickness of the pulse shews, that the heart is contracted more frequent than it should be, in the same space of time; its hardness points out the fullness of the arteries, that the blood is very compact and dense, and that with difficulty it gains a passage through the minute vessels, by means of its inflammatory viscosity.

All the blood thrown out of the right ventricle of the heart, ought to pass through the lungs before it can return into  
the



the left; but as the right ventricle would not suffice to propel all the blood thro' the narrow passages of the pulmonary artery, by its own muscular force alone, there is farther required, the concurring action of inspiration to dilate the lungs, and thereby open a free passage to the blood that is thrown from the heart. In proportion, therefore, as the right ventricle of the heart, in a given time, contracts oftener and stronger, so much the more frequent and strong the inspiration is required to be. Thus we see, that whenever the motion of the blood is increased by running, or any other violent exercise, the respiration increases in proportion, and is performed with greater difficulty. And thus, the respiration is greater, merely from an encrease of the velocity of the blood which passes thro' the lungs; but when, besides this, thro' the greater motion, the blood begins to assume an inflammatory spissitude, the respiration will then be much quicker and more difficult; for this ill quality in  
the



the blood, of its not being able to circulate, first shows itself in the lungs; and, for this reason, in acute diseases of the inflammatory kind, a short and difficult respiration is reckoned a bad symptom.

A diminished circulation is always attended with a relaxation and fullness of the veins.

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*Diseases from a Defect of the Circulation,  
and of a Plethora.*

THERE is no fermentation without air, and putrefaction comes on far more slowly when the air is excluded.

By a plethora is not meant every increase of the humours, but only an increase of the quantity of good blood.

If the viscera, whose office it is to change the aliment into chyle, be firm and strong, a large quantity of chyle is drawn from the food we take down. And if the heart and arteries be equally strong,



strong, this large quantity of chyle is converted into good blood; and as the veins are always naturally of a laxer nature, they will easily give way to the distending liquid, and admit this superfluous quantity, unless they are emptied by motion and exercise. For the less motion there is in the vessels, the more the humours are aggregated in the veins; whereas the greater the motion is, the more the arteries are filled, and the veins emptied. When hard drinkers pour down such vast quantities of liquor, they would be suffocated, if the veins were not capable of giving way and receiving the superfluous part of it; and therefore it is that these people have their veins so much inflated. If then much chyle and blood be formed in the several viscera set apart for this purpose, and the laxity of the veins at the same time be proportionably greater, the quantity of good blood must of necessity be accumulated.

Men used to frequent bleedings suffer the same inconveniencies at their accustomed



tomed times of bleeding, as women do by the retention of their menses, till at length they become quite as lax as women.

Rarefaction alone is capable of producing a plethora; for if the blood be rendered twice as rare as it was, it is the same thing with respect to the vessels, as if there were really twice the quantity of blood contained in them.

Medicine never cures diseases better than when it imitates nature.

Hard working people, though they eat voraciously, are seldom known to be plethoric, because labour carries off that which would otherwise be retained in a state of idleness, and gives such a firmness to the solids as not easily to yield to the filling liquors. Exercise should never be prescribed till the vessels are first emptied by bleeding; the vessels else, by being too much distended, would be apt to break.

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An



*An Obstruction.*

**A**N obstruction seems chiefly to take place in the vessels, and very seldom or ever in the larger receivers.

This may arise from three causes;  
1. Either that the liquid which is to pass is grown more viscid, while the capacity of the canal remains the same; 2. or, The canal is grown narrower whilst the liquid remains as it was; or, 3. The narrowness of the canal and the viscosity of the liquid are joined together.

The particles of all fluids cohere with a certain degree of force. Now, in order that the fluids may pass thro' the smallest extremities of our vessels, it is requisite, that they pass single and freed from their cohesion with the rest; the powers therefore that carry the humours thro' the vessels, must be able to overcome this cohesion. Should therefore the cohesion of the elementary particles be so encreased, as not to suffer themselves to be divided



vided from each other by the action of the heart and vessels, several of them will remain inspissated, which ought to have passed singly through the extremities of the vessels, and so form an obstruction.

All tumours must arise, either from the fluids distending the vessels beyond their natural bulk, or from their being extravasated, or from the vessels being con-creted with their inspissated liquids. When the arteries and veins which are charged with red blood, are so distended by the quantity they contain, as to compress the smaller vessels that lie near them, they may do much mischief.—The effects of this kind of tumour are especially seen in the damage it does to the actions of the brain; for the cranium being always entirely full, and no red blood being any where to be found but in the *pia mater*, and the large red arteries dispersed through the medullary substance of the brain, and surrounding the *medulla oblongata*, the cortical sub-



stance naturally containing none, it follows, that when these red blood vessels are distended, as the hard boney part of the cranium cannot give way, the other vessels of the cortical substance and the medulla must be compressed; by which means, all the functions of the brain will be disordered, only the cerebellum, being much firmer than the cerebrum, will in this case be less affected.

Tumours attended with pain are called *phlegmones*; if without pain, and hard, *scirrhi*; if without pain, and soft, they are then properly called *oedemata*; which are applicable to tumours arising from the *membrana cellulosa* only. The matter of them is generally water, as in the anasarcaous dropsy; or some other more viscid pituitous liquid, as in a leucophlegmatia. Now the *membrana cellulosa*, which is the true seat of these tumours, surrounds all the vessels; the tumours arising thence are consequently capable of lessening the areas of the vessels, and frequently of producing very surprising dis-



diseases, which shall be entirely owing to this single cause.

Varices happen more particularly to women with child, and that more especially in the legs, because, when the womb is distended, and presses upon the iliac veins, it prevents the veins of the thighs and legs from discharging the blood they contain so expeditiously as they ought.

A callus is a membranous part, increased in bulk, attended with hardness and insensibility, arising from the vessels being concreted together, and chiefly by an external compression. Its proximate cause is the compression of the vessels, the expression of the liquid they contain, and the concretion of their sides.

The proximate cause of all obstructions is only one, which is always simple and the same; *i. e.* the greater bulk of the matter that is to be transmitted above the capacity of the canal that is to transmit.



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There are two causes that distend the arteries, the force of the heart propelling the blood, and the quantity of blood already contained in the arteries; if the force of the heart be lessened, the whole circulation proceeds slowly; if the quantity of the distending liquid be diminished, the fault lies in inanition. But the capacity of all the vessels depends on two opposite causes, the force and quantity of the liquid which is moved in the vessel, and the contractile power of their sides, which resists the distending causes; as soon therefore, as the distended causes are lessened, the contractile powers will produce the same effect, or which is the same thing, the vessels will be made narrower. When the particles of our fluids lose their spherical figure, they must of consequence lose the possibility of an uniform transposition through the vessels; for since by the motion of the heart and arteries, every particle of the blood has a different motion and situation every moment, it was requisite to make this motion uniform,



form, that they should be of such a figure as might enable them to pass thro' vessels in any situation; which is the case of a spherical figure only.

The density of the particles of the blood is always proportional to the power of the heart and arteries. The shape of the elementary particles of our fluids, so far as we can discern by the help of instruments, is spherical; and this is obvious, if we consider that the blood is thrown, by the great force of the heart, into a conical vessel, that is reciprocally dilated and contracted, and incurvated as soon as it comes from the heart; it is plain therefore, that no particle of blood can keep the same direction for two moments together; and consequently, that the particles must be continually striking against each other: so that if any angular part should stick out in any elementary particle, that point must sustain the rotation of all the rest; and therefore, will soon either be beat off, or smoothed down. Add to this, that the extremities of the arteries, if cut transversely,



have a circular section, and so may give their figure to such particles as are of a flexible nature.

The stronger a man is, the greater is the danger of concretion, if his blood be at rest in the vessels. And therefore, those faintings, which weakly girls are so subject to fall into upon every slight occasion, are seldom so dangerous, as their blood is in too dissolved a state, and scarce ever, or at least, very slowly concretes, though it remain unmoved. The serum of blood will turn to ice, when exposed to the twenty-eighth degree of cold marked in Fahrenheit's thermometer ; so that it requires a greater degree of cold than water, and probably because it is enriched with salts.

If blood be taken away on the first day of the small-pox, it shall look well to the eye; if on the third or fourth, it shall be covered with an inflammatory crust, because the most liquid parts being carried off by the fever, and the thicker parts more closely compacted, the particles



ticles of blood begin to cohere more firmly together; for whilst there is a large quantity of thin liquid interposed between the thicker parts, the pressure of the vessels will not change their figure; but when this is carried off, the thicker parts of the blood becoming contiguous, will be forcibly compressed by the action of the vessels, lose their spherical figure, touch each other in many points, and run into concretions. For when the vessels are very strong, so as to compress their fluids with great force, the finest part will be carried off, and the thicker parts united by this compression.

All acids do not coagulate the blood, for the acidulous wines, juices of ripe acid fruits, vinegar, butter-milk, &c. rather dissolve it; but the fossil acids that are prepared from sea salt, nitre, &c. will coagulate it. Alum, and the various sorts of vitriol, produce the strongest coagulations.

Alcohol, applied to the bleeding mouths of divided vessels, puts a stop to the  
most



most violent hæmorrhages, by coagulating the blood. The serum of the blood itself will presently become hard by pouring alcohol upon it. How dangerous therefore, is the excessive use of spirituous liquors!

No obstruction can be possibly formed in canals, through which, during the course of life, the liquids are carried by a perpetual motion, unless the direction of the motion be from a broader orifice to a narrower: that obstructions may arise in conical vessels, through which the liquids are moved in a direction, leading from the basis to the apex, is certain; for, the particles of the fluids arrive at a narrower section of the cone every moment; and that which easily passed at the basis, may easily stick in the extremities of this converging canal; and then the liquid behind will always press the unpassable mass, into a still narrower pass, and so increase the obstruction; but in the veins, where the direction of the motion tends from the apex of a conical canal, to its basis, an obstruction seems



seems not possible, unless by the external compression of the vessel; for whatever has passed the narrow orifice of its vertex, will easily pass the other sections of the canal, which are continually growing larger: and though the particles of the fluid be supposed to unite into still larger particles, yet as these are not supported by the diverging sides of the veins, they will easily be carried along by the impetus of the subsequent liquid.

In a peripneumony, it is a bad symptom if the blood drawn from a vein be too dilute, and scarce disposed to coagulate, because it shews, that the thinner parts only pass through the lungs, while the thick are accumulated.

It often happens, that acute inflammatory diseases of the head shall leave behind them an incurable deafness or blindness during life; the reason of which is probably this, that when the greater vessels were obstructed by the inflammation, the lesser one derived from them, being compressed and collapsed,

were



were by this means grown together. When in an apoplexy the brain ceases to perform its functions, it is seldom cured; some defect or other of the functions always remaining, which for the most part proves incurable.

When the stomach is distended with a large quantity of meat and drink, and presses the descending trunk of the Aorta, the turgid face, the red eyes, the increased pulsations, and the quicker respiration, all shew the quantity of blood to be increased in the upper parts, and that it flows with greater celerity through the vessels; hence it is that we meet with so many instances of persons who have died of an apoplexy immediately after a full meal. If a confirmed scirrhus or a malignant cancer, that will not admit of extirpation, are the cause of an obstruction, he must be a bold man that in such a case will presume to promise a cure.

The passions of the mind are capable of very suddenly and very powerfully increasing the contractility of the solids.

I have



I have seen a woman in perfect health, who upon a sudden fright had a tumour immediately rise in her breast, which, tho' very properly treated, hardened into an irresoluble scirrhus. Warm water will soften the harder parts of the body: but when turned to vapour, will more effectually discharge this office; the joint of the elbow, grown immoveable from an obduration of the ligaments, was rendered intirely flexible, in two months, by being exposed for two hours every day to the vapour of warm water. Where this can be conveniently directed to the part, it is most undoubtedly to be preferred to all other methods. Warm water dropping from an higher situation on the part affected, has done wonders in topical diseases; chronical and stubborn tumours of the knee, have been often cured thereby.

Bleeding often is useful in obstructions arising from the encreased contraction of the fibres; for thus emptying the large vessels, the lesser vessels which form their sides are less compressed, and the force by

which



which the liquid is impelled against the obstructed place is diminished; and in case the quantity of blood taken away be large, so as to endanger swooning, the pressure of the vital liquid from the basis of the vessel to the vertex being by this means removed, the smaller vessels will be enabled to contract and repel the liquid which obstructs them in the larger vessels. A callus, if pared off from the skin, will grow again, although no vital liquid flow through it: and this seems to arise from the concreted extremities of the vessels being gradually protruded by the vital liquid; as also because the open extremities of the vessels that are next the callus are compressed by it.

Animal motion encreases the velocity of the circulation, and renders the solid parts more firm.

Frictions are of great use in resolving obstructions. I have seen an indurated parotid gland, after many good applications have failed, resolved by being well rubbed with woolen cloths for an hour  
together.



together, twice a day, after having been exposed to the vapour of warm water and vinegar. The same has been effected in the glands of the neck, which have been strumous.

Muscular motion also is of singular service in this case; as the motion of the venal blood being accelerated thereby, it occasions the heart to contract oftner and stronger, increases the circulation, and more frequently distends and contracts the vessels alternately in a given time.

Sea-salt, sal gem. sal ammoniac. being much alike in many of their qualities, have also a resembling power of attenuating. The two former, when given inwardly, mix indeed with our humours, but pass off by urine in a great measure unchanged; for which reason, though they pass through most of the vessels of the body, yet they undergo no alteration from their action. Now whatever is taken down, and cannot be changed by the powers of the body, will constantly ex-

cite



cite a greater motion, and thus will act also as stimulants.

But sal ammoniac. which is lighter than the other two, and more like the native salts of the blood, is more capable of being changed by the power of the body, and of a very penetrating nature; and is therefore generally preferred before the rest, and justly commended as one of the greatest deobstruents both in acute and chronical diseases.

The action of these salts seems to consist in this, that when they are mixed with the humours, dissolved, and conveyed to the obstructed places, from a kind of constant attrition by the action of the vessel against the obstructing mass, they divide it by their weight and figure, and thereby make it passable through the vessels; at the same time encreasing the action of the vessels by their stimulating property.

When the vessels under the unbroken skin are ruptured by a contusion, and the blood concreted into a mass, which is  
still



still entire, these salts dissolved in water, and applied to the part, will most happily dissolve it. Those who indulge themselves too much in eating large quantities of sea-salt, shall have their blood so dissolved, that it can scarce be retained in its vessels; hence oftentimes will arise very violent hæmorrhages, partly from the blood's too great dissolution, and partly from the too great acrimony of the humours which erodes the vessels.

The modern nitre seems quite different from that of the antients; for there it appears to have been of an alkaline nature, or perhaps, it was the sal ammoniac. to which they gave this name.

Modern nitre is of a nature strangely ambiguous, between vegetable, animal, and fossil. If free from sea-salt, it remains dry in the air, dissolves entirely in water, and is the lightest of salts, is a very great attenuant, and of great use where there are obstructions from an inflammatory density in the blood.



Borax is a very wonderful salt, whose nature is not well known, and its history confused, even in the best writers.

It is commended much as a deobstruent, and used in the most obstinate diseases, as it acts partly by its wonderful stimulus, and partly by its attenuant saline power.

All soaps contain an oil so accurately mixed with a salt, as to be capable of being dissolved in water without separation; the more subtle the oil and the salt are, of so much the more excellent use is the soap which is made from them.

Pills of foot gilt over, to prevent their giving offence, in viscid diseases, have often done great service, from their soapy attenuant nature.

That bile has a dissolving power is most evident in those diseases where, by being hindered from passing in its usual course, it regurgitates backward into the blood, for then it turns it all to water; and for this reason it is, that obinate jaundices are almost constantly followed by a dropsy.

The



The bile kept inspissated in the shops in form of an extract, is give pills; if this inspissated bile be rubbed on the swollen bellies of children, it will dissolve the concretions formed in the intestines, and carry them off by stool.

It is sufficient if a physician knows the effects of quick-silver, when applied to the body, though he be not acquainted with its particular *modus operandi*.

The virtue of other remedies is no less obscure to the enquirer. Who has ever explained the manner by which scammony carries off the blood by stool, after it is converted into a putrid water? Whoever has thoroughly understood the wonderful properties of antimony, and its several preparations?

Bleeding will succeed better in a pleurisy, if the side affected be gently rubbed at the same time that the blood is flowing from the vein; or if the patient move the affected part, by frequently drawing in his breath as hard as he can, or by coughing.



Inflammatory diseases are more easily cured in men of lax habits, than in strong men who have been accustomed to hard labour.

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*Of Wounds in general.*

**I**F the orifice of a wound be of the same size with the instrument which inflicted it, it is a sign that it was thrust straight forwards in the wound; but if a broad sword makes a round orifice, it is a sign the weapon was turned round in the wound.

When the aponeurosis arising from the tendon of the biceps muscle in the arm is accidentally injured in opening a vein, the severe symptoms which follow do not result from the slight wound or puncture in the part, but from its tenacity and connection with adjacent parts.

Wounds are more or less dangerous from their situation; for if a small branch of one of the intercostal arteries, for example,



ample, be wounded, so that the pleura is perforated at the same time, the extravasated blood will then escape into the cavity of the thorax, and be productive of much mischief. Thus also a wound is much more dangerous when inflicted in the interior, than in the exterior part of the thigh, because of the great blood-vessels which are seated in the former.

A slight fever happening in the inflammatory state of wounds, does not often prove hurtful, but is rather serviceable, by forwarding the formation of *pus*, or matter, in the wound; and when the *pus* is formed, the fever generally vanishes. When this slight fever arises about this time, after cutting for the stone, amputating of breasts, or in the like wounds, it is always a good presage.

*Pus* is never formed in wounds, unless they are secured from air, either by the natural crust formed on the surface of wounds, or by plaisters and dressings, &c. so that the matter is not formed



within, but out of the vessels in the cavity of the wound, from the juices there extravasated, digested and changed by the heat of the body. For if all the matter be cleansed from the surface of a wound with soft-scraped lint, within an hour after it will appear all over beset with a thin liquor, instead of matter: but when the wound has been covered with a plaister for four and twenty hours, upon removing the dressings, plenty of matter appears.

A gangrene is termed that affection of the soft parts, in which they tend to death or mortification, from a deprivation of the vital influx and efflux of the juices by the arteries and veins. If a gangrene therefore follows the total division of a large nerve, it must hinder that vital influx and efflux of the juices: yet we know the arteries and veins are here entire, and their contained juices in a healthy state, and the nerves only appear divided; but if we again consider that the motion of the arterial fluid  
results



results from two causes, i. e. the force of the heart, and the action of the arteries; and also remark, that the force of the heart is spent chiefly in dilating the arteries, it will thence follow, that the principal cause moving the fluids in the arteries, must be their contraction, which is performed partly by their elasticity, but principally by the action of their round muscular fibres, by which the dilated arteries are again contracted; but we know from physiology, that the action of a muscle, or muscular fibres, requires that the nerve thereto belonging be sound or entire: and as we know that the nervous trunks give branches to the adjacent arteries, it is thence evident that the nerve being wounded or destroyed, the muscular force of the artery propelling the contained juices, must also perish; so that the blood will move it in such an artery only by its remaining elasticity, and the impetus received from the heart. In the veins again the blood goes on with



the velocity which it had in passing into them out of the arteries, which is again accelerated by the motions of the adjacent muscles, swelling in their contractions, and pressing the adjacent veins, so as to promote the course of their contained blood; but the nerves being divided, the subjacent muscles become paralytic, and lose all their power of motion. Thus the impetus of the blood being diminished, in passing from the arteries through the veins, for want of the protrusive action of the adjacent muscles, it will therefore stagnate, or move slower in the veins, and be there accumulated; from whence again will arise a greater resistance to the arteries, whose muscular contraction is now much weakened: from which causes the vital motion of the juices through the arteries and veins into the parts below the wounded nerve, will at length be totally destroyed; that is, a gangrene will be the consequence.

If, on the pricking an aponeurosis of the biceps muscle in bleeding, long red spots



spots appear externally in the skin, it is almost constantly reckoned one of the very worst signs.

There is not a better remedy in the puncture of a nerve or tendon, than the black *Balsamum Peruvianum*, made a little warm, and then dropped into the wound.

Wounds should be washed with warm water mixed with a little honey, wine, and sea-salt; that, by removing all the clots of blood, the whole surface of the wound may be clearly viewed, and the hæmorrhage be restrained, which may easily be done in the extremities or limbs, by compressing the trunks of the vessels with the tourniquet, or a proper ligature. In other parts of the body, if the injured vessels are not very large, the hæmorrhage may be restrained with warm alcohol vini.

If a great weakness of the vital functions immediately ensues, after a wound that has penetrated into the cavity of the abdomen, attended with a swift palpita-

tion



tion of the heart, a small, quick, and unequal pulse, paleness of the face and lips, and coldness of the extremities, we may then conclude, that a large quantity of blood is extravasated into the cavity of the abdomen, from a wound in some of the larger vessels. If a wound be inflicted in the neck, without any considerable hæmorrhage, and afterwards is attended with symptoms like the preceding, there is then reason to fear that the recurrent nerves are injured, as they descend through this part, to their distribution in the vital organs. If the like symptoms follow a wound of the head, there is reason to believe that the cerebellum is injured or compressed by the extravasated juice; or if a wound of the head is followed with a loss of all animal actions, we have then great cause to apprehend, that the brain itself is in like manner hurt. If again we observe, after a wound has been received in the back, that all the parts below the wound are deprived of sense and motion, we  
may



may then reasonably conclude the Medulla Spinalis to be injured.

If blood be discharged of a scarlet or frothy colour, either by the mouth, or from the orifice of a wound of the thorax, we may know thence that some pulmonary vessels are divided. But if after a wound of the abdomen, any of the chyle is discharged from thence, it denotes that the small intestines have been injured; but if any of the fæces come out, it plainly indicates the great intestines have been wounded. If any blood comes away with the urine, we are then to conclude that the kidneys, ureters, or bladder have received injury.

If the spinal medulla be wounded pretty deeply in its upper part, its soft substance will be destroyed, and the action of the brain and cerebellum will be abolished from the parts below, at least so far as they were dependent on the continuity of the medullary fibres wounded; for the eighth pair of nerves, the

*par*



*par vagum*, with the intercostal, arise much higher from the medulla oblongata within the cranium; and their branches go to most of the vital viscera. Hence then a person does not die hastily after such a wound, though he will inevitably perish sooner or later, according as the medulla was more deeply wounded, or in a higher part; the reason of which is very evident, for the brain and cerebellum secrete from the arterial blood, that very subtile liquor which is afterwards continually sent to all parts of the body, by the medullary fibres of the encephalon continued through the nerves; so that if the quantity of blood brought to the secretory organ remained the same, then the number of the canals, which ought to contain and carry the secreted liquor to the respective parts, will be disturbed, and at length destroy the actions of the secretory organ itself; but it generally happens that large blood-vessels are injured, at the same time that the medulla spinalis is wounded; whence the



the extravasated juices having first filled the cavity of the vertebræ, easily re-ascend afterwards into the cavity of the cranium.

The divided lips of a wound will form a larger hiatus, the stronger the cohesion of the parts was before.

An aneurism proceeds from whatever cause which destroys the cohesion, or diminishes the force of the coats of an artery in any part.

An aneurism may be known and distinguished from other tumours, by its manifest pulsation sensible to the touch; and when the tumour disappears, or greatly diminishes by a slight pressure, it returns again when the pressure is removed. Again, in compressing an aneurism, especially one that is large and near the heart, the patient will be in great danger of suffocation, unless it be done very gently and gradually; for the con-creted blood returned out of the sacculus of the aneurism gives so great a resistance to the blood in the aorta from the heart, as to destroy the motion of this last very suddenly :



suddenly : or, if a large aneurism be compressed by the hand, the pressure must not be taken off all at once, but by degrees, otherwise the patient faints, from the sudden return of the blood into the cavity of the sacculus; and therefore the patient always complains of an intolerable anguish or oppression in the thorax, when a large aneurism is thus compressed. But when any aneurism lies concealed in any of the viscera, or more internal parts, it is much more difficult to discover; but if the known causes of an aneurism have preceded, the patient perceives an unusual pulsation, the heart palpitates, or is disturbed in its motion, and suffocation almost follows, from quickening the blood's motion, either by exercise or any other cause; these circumstances will give us room to suspect an aneurism in some internal part of the body.

As aneurisms in the internal parts of the body are inaccessible to the hand, there are but small hopes of a cure: all that can be done for the patient, is to abate  
the



the impetus and velocity of the blood's circulation, by a thin diet, and repeated phlebotomy; by which the aneurism may be prevented from encreasing as much as possible, provided the patient be ordered to refrain from all emotions both of body and mind. When the aneurism is accessible to the hand, and not yet encreased to any formidable size, there may be some hopes of relieving it by a prudent compressure; in making which it will be also of no small service to keep a moderate pressure upon the artery above the aneurism, to abate the impetus of the blood, and prevent it from easily regurgitating back towards the heart. When we can hope for little or no benefit by compressure, or when it has proved ineffectual, there then only remains the operation of extirpating the aneurism, the safety and success of which we are taught by experience.

Every thing which encreases the resistance to the blood's motion from the heart, may occasion a preternatural enlargement



largement of its ventricles : such as too great a redundance of juices in those who are plethoric ; a too great velocity of the blood in acute diseases, or an obstruction of its passage through the arteries, from an inflammatory disposition, or from polypous or atrabilious matter, &c. a defect in the arteries, through which the blood's free course is impeded, as when they become too tough or callous, or degenerate into a cartilaginous, aneurismatic, or bony substance, &c. all which constitute the principal causes from whence the cavities of the heart are usually dilated beyond their natural dimensions. The heart, though that is a rare case, has been found greatly distended in its cavities by air.

That this disorder is either present, or at least to be feared, may be known from the violent palpitations of the heart, attended with the signs which denote that the free course of the blood is obstructed through the lungs ; especially if the pulse be full and hard, with an intolerable anguish,



guish, increasing upon exercise; for we may then reasonably conclude that some obstruction is about the aorta.

It is of the utmost consequence to distinguish the true from the spurious aneurism; the signs therefore of this last ought to be particularly known. A spurious aneurism may arise from any cause destroying the continuity of the sides of the artery, the skin at the same time remaining entire, or at least so closed, that the blood cannot have a free passage through it from the wound, whence it is accumulated and distends the cellular membrane. It is partly discovered by this means, more especially from violent contusions, and from the sudden formation and encrease of the tumour, which happens much slower in the true aneurism. The tumour here is also more irregular, or not so distinctly limited or circumscribed, because the blood spreads all ways in the cellular membrane; whereas in the true aneurism the tumour is limited by the dilated coats of the artery. Add to this,

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that



in the true aneurism there is always a manifest pulsation corresponding to that of the artery, especially towards its first formation before it has obtained a formidable bulk; but in the spurious aneurism, the pulsation is less sensible, though this circumstance is not altogether to be depended upon. In a true aneurism that is not very large, the tumour wholly disappears by compresure from the distending blood returning into the artery: but then this does not happen in the spurious aneurism; for that being pressed in any part yields, indeed, but then the tumour encreases in the adjacent parts. Lastly, the colour of the skin is seldom or never altered in the true aneurism, at least in the beginning of it; but in the spurious aneurism, the blood, being extravasated under the skin, makes it appear of a black, livid, or other preternatural colour.

Every visible nerve which is wounded suffers not only as it is a nerve, but also as it is a composition of membranes and vessels of all orders, whose continuity



ity and action are also injured by the wound.

The utmost caution is required in dangerous wounds, to determine whether heterogeneous bodies ought to be extracted or left in the parts. If from duly considering all the circumstances, it shall appear that the patient may live the longer or the easier by their removal, it ought doubtless to be done; but if, from an anatomical knowledge of the parts and their functions injured, the nature of the wound appears to be such, that a removal of the bodies will threaten a certain or speedy death, they ought then deservedly to remain; since desperate cases are best let alone, lest any blame of the patient's death should be imputed to the physician or surgeon. If the surface of a wound appears dry, and of a deep red colour, affording very little matter, the surgeon may conclude the wounded vessels resist too much the impulse of the juices, and deny them a passage. But if every part of the wound



appears equally moist, and moderately red, the bottom of it rising gradually every day, and the sides encreasing all round towards the centre; these shew that the vessels are lax enough to admit the impelled juices, and be thereby elongated. Yet if the wound discharge a great deal of moisture, and fills up unequally round the sides, it is a sign the vessels are too lax; and therefore require to be treated with contrary medicines. Our aliments do not nourish, till they have been first changed from their own nature into that of animal juices, by the structure and action of the proper parts.

We should be careful not to let a wounded patient want drink, since thirst denotes a dryness of the body, and that the juices are either gross and impervious, or mixed with acrid particles, all which must be highly pernicious to the wound, since it requires to be supplied equally in every point, with mild or tasteless, and pervious juices; a moist  
and



and cooling diet therefore is here necessary, to dilute the juices, open the vessels, and render them easily pervious; also to discharge the acrimonious and offensive parts of the blood, in the form of urine and sweat.

Diet ought to be proportioned to the course of life. An expert surgeon will presently observe a change in the condition of a wound for the worse, after a patient has eat fat substances, such as bacon, or pork, &c. for this oily matter, being carried to the wound, obstructs the smallest vessels, and becoming rank or acrid by standing, excites an inflammation not easily to be removed.

Want of fresh air is remarkably hurtful to those who are wounded in the head.

It is an observation of *Sanctorius*, and all others who have wrote *de Statica Medicina*, that joy causes perspiration, and renders the body light. *Balsams*, especially the natural balsams, all retain a thick adhesive quality, with a mild aromatick



joined with an acid, both which resist putrefaction, and at the same time are not offensive by their acrimony, because enclosed in a soft oil. This we know from a chemical analysis, which procures an acid liquor, with a thin, fragrant, and aromatick oil, from all natural balsams; while the thick resinous part remains behind, in the bottom of the retort. When these balsams are gently warmed, and applied in a moderate quantity, so that they may spread equally over the whole surface of the wound, they not only cover and defend the extremities of the tender vessels, so as perfectly to exclude the air, and prevent the parts from drying, but they also preserve the extravasated juices from putrefying.

*Nature herself is the only real sarscotick.*

It is highly necessary to be well acquainted with the situation of the parts when in a state of rest, especially during the time of sleep; for at that time all voluntary motion ceases, and the parts of  
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the body, being left to themselves, assume the most easy and natural figure. We then observe, that none of the limbs are extended, but that all of them are a little inflected: so that in a healthy person sleeping, the fingers are never stretched out, nor does the leg form a right line with the thigh; all these joints make obtuse angles: for the muscles, bending the limbs, are generally found stronger than the extensors; so that when neither of them are in action, the natural contractile power in the fibres of the flexor muscles will overcome that of the extensors, so as to make the limbs always appear in a posture somewhat inflected during sleep or rest. What has been said is also very apparent in palsies of the limbs, when all the voluntary actions of the muscles cease; so that when, for example, the whole arm is become paralytick, the fingers are always found and continue inflected, insomuch that it is often impossible to extend them after the palsy is cured, from a rigidity of the



connecting ligaments in the joints, and from a contraction of the tendons of the flexor muscles, which shrink by their own natural contraction, and for want of being stretched or elongated by the action of the extensors: thus the flexor tendons become shortened, so that the extensor muscles cannot overcome their resistance. “The patient, says *Hippocrates*, ought to be found by the physician lying down on his left or right side, with his arm, neck, and legs, a little inflected, and his body even with the floor, for in that manner lye most people in health.”

When this circumstance is neglected in the care of wounds, the parts grow together in a different manner from what they naturally were in before, and frequently a great deformity arises from the distortion of the parts, or a deprivation of their natural motion. This caution must be duly regarded at the first dressing of the wounded parts, which, being fresh, speedily unite; so that it will be difficult to correct the mistake once committed, unless



less by laying them open again, after they have united. Causticks, stypticks, or astringent applications should be avoided, when we intend a handsome cicatrix; because those remedies either destroy the living vessels, or so contract them, as to render them incapable of transmitting their fluids, and the dead, or obstructed extremities of the vessels will suppurate, whence follows a loss of substance, a consumption of the fat, and a more or less deep and unsightly scar. It is also hence evident how much an equable compression may contribute to the neatness and uniformity of a cicatrix, by preventing the too great distention and protuberance of the vessels.



*Of Hæmorrhage, Pain, and Convulsions.*

**T**HE word hæmorrhage literally and originally means, a large and forcible flux of blood, though it is understood now of any discharge of blood from any part. When occurring alone in *Hippocrates*, without any mention of the part of the body, it then only means a bleeding from the nose.

Hæmorrhages are restrained either by contracting the orifices of the divided vessels, or by coagulating the blood, or by both together, so as to obstruct its course.

A gangrene follows upon pain, more especially when a violent fever and inflammation are present at the same time; for then the impetus of the circulating juices being increased, speedily destroys the parts.

When a phlegmon or inflammatory tumour has distended the skin and subjacent *panniculus adiposus*, so as to obstruct



tract the cutaneous nerves, and excite severe pain, even when it cannot be discussed, but tends to suppuration, so as not only to continue but encrease the distracting cause; in this case, the constant application of an emollient cataplasm will so relax the nervous fibres as to ease the pain, so that they are either more easily ruptured, or else continue to be distracted without danger of breaking. Thus all soft expressed oils, taken in large quantities, happily relieve iliac, colick, and nephritick pains. The vapours of hot water, and every thing that mollifies and relaxes, are therefore used with success in all pains. When intense pains arise from the puncture of a nerve, the most expert surgeons foment the parts day and night with the most emollient medicines. Hence all emollient and relaxing substances afford an universal remedy for easing all pains, because they remove the proximate cause of pain in the nervous fibres, viz. their danger of breaking; whereas all other applica-  
tions



tions act only upon the remote causes of pain. Even when the particular cause of the pain is unknown, these remedies may be always safely and successfully used: and they have also this advantage, that while they remove many of the remote causes of pain, they do not increase those causes of it which are not removable. When they have relaxed the vessels, the distending and impervious juices will then have a ready passage, and its acrimony will be at the same time obtruded. But every thing which augments the strength and contractile power of the solids, while the distending cause continues to act upon the fibres, will always increase the pain. Hence pleurifies are observed much severer in strong and laborious people, than in those of a more lax and weak habit. Luxations are also reduced with much more ease, and with less pain in these last, than in persons of a robust habit, and even in some, the ligaments are so easily elongated, that their limbs may be disjoined without any pain.

When



When executioners have violently extended almost all the limbs of criminals by way of torture, they know that by pouring cold water upon them, the pain becomes still much more intense: whenever therefore, the action of laxative and emollient remedies can reach the seat of the pain, they will always have the desired effect. If, for example, a stretched nervous fibre becomes painful in the middle of a tooth, that pain cannot easily be relieved by emollients; and the same is true, when intolerable pains arise from an affection of the medulla of the bones; and also in the worst species of the paronychia, where the seat of the pain is in the tendons of the flexor muscles of the fingers, confined by their cartilaginous capsules. It may also sometimes happen, that though the pain is very severe, yet the use of relaxing and emollient remedies, may be prohibited by the other symptoms: thus emollients would be pernicious in a latent or ulcerated cancer attended with extreme pain, because they



would greatly augment the putrefaction, and the fungous excrescence which attends the disorder. But in almost all other cases, the emollient and relaxing remedies are of universal service for easing pains.

All pain supposes life residing in the part; and if the pain arises from some impervious humour distending the obstructed vessels, it will always be the more severe, as the *vis vitæ* is more powerful and active. Hence in pleuritick fevers the pain is almost intolerable, because the fluids are violently urged into the obstructed parts, and by dilating the vessels, they very forcibly distract the nervous fibres composing the coats of those vessels: every thing therefore which abates the impetus and velocity of the circulating juice will ease pain.

Every convulsion is a disorder of some muscles; and is at present used to signify a violent, involuntary, and alternately repeated contraction of a muscle.

Of



*Of Wounds in the Head.*

**A** Vertigo, noise in the ears, bilious vomiting, sleepiness, a depravation or abolition of some or all of the senses, &c. in wounds of the head, are always of bad import.

The symptoms which appear soon after the infliction of a wound are less to be feared than those which happen afterwards, or continue a long time, whether they are fevers or other symptoms.

If the wound be slight, but attended with contusion, many bad consequences are to be apprehended ; for we may say a part of the body is contused, when many of its small vessels have been broke or destroyed by the violent pressure of some obtuse instrument ; and therefore contusion is always joined with a laceration of the vessels, and extravasation of their contained humours, and a consequent corruption of them from their stagnation. Since the hard bones of the  
skull



skull are placed beneath the integuments of the head, unless the wounding instrument was sharp, it must always occasion some degree of contusion, more for this reason in the head than in other parts of the body. But since the skin of the head is very thick, and the subjacent *panniculus adiposus* very thin and easily dilatable, being resisted beneath by the hard bones, it is evident that extravasated juices corrupted by their stagnation will easily force themselves a passage through the non-resisting *panniculus adiposus*, and descend by their weight. And thus they may press to the back part of the head, and there irritate the large muscles, which are inserted into the os occipitis, so as to excite malignant symptoms. In the same manner the corrupted juices may also descend to the temporal muscles, and to the forehead and eyes, and there produce the like bad consequences. That the extravasated juices may thus easily pervade the cellular membrane, is evident from incontestable observation; for when a contusion in the

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vertex of the head has escaped unobserved ; on the next day, the forehead and eyelids themselves have been often found swelled and livid, from the extravasated blood filtrating through the cellular membrane to those parts ; and therefore *Hippocrates* justly condemns wounds of the head inflicted by blunt instruments. “ They  
“ contuse, lacerate, and corrupt the soft  
“ parts. And besides that, wounds of  
“ this kind are rendered more purulent  
“ and moist, and are sinuous about the  
“ sides, and in some measure all round,  
“ and they take up more time in deterg-  
“ ing and healing them ; for contused  
“ and lacerated flesh must of necessity  
“ turn into matter, and be therefore con-  
“ sumed.” Another bad consequence to be feared from such wounds is a contusion of the periosteum, or the bone itself, or its being injured, by the extravasated humours ; from whence a caries of the bone, and its usual bad consequence, may be expected : for a bone of the cranium may be contused,

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and



and at the same time seem to be in its natural state ; and the contusion may extend more or less into the substance of the bone, though the degree of injury cannot be judged of by the eye, as *Hippocrates* himself prudently observes. From whence it is evident, how deservedly contused wounds of the head are suspected by prudent surgeons ; since the most malignant consequences may follow a long time after, when every thing is believed to be well. Among the many observations which confirm this, we shall only bring one instance cited by *Bohnus* from *Paw*. A certain person drinking in company with another, was struck by his companion with a pewter-pot over the right parietal bone, nor could any fissure be perceived in the bone : he walked, and was seemingly very well ; till ten months afterwards he was taken with a vertigo in walking, and expired in a little time. Upon opening the cranium in the affected part, the bone and the dura mater were found perfectly rotten and fetid.

An



An erysipelas is a superficial inflammation, almost constantly restrained to the skin, of a reddish yellow colour, seated chiefly in the smaller vessels, which are less than those that convey blood, occurring in no part more frequently than in the head and face, and almost constantly denotes something malignant in injuries of the head.

It is remarkable that the cellular membrane is more easily distended, as it is thinner and less replete with fat; whence it is that this membrane about the eyelids is so easily inflated, and that about the scrotum and penis it is so easily distended to an uncommon bulk in an *anasarca*, because in those parts the cellular membrane contains no thick fat, but, if any thing, a sort of mucilage; except in castrated animals, in which a vast quantity of fat is accumulated in this membrane. Tumours thus formed are properly enough termed *emphysemata* or inflations, which *Gorræus* defines to be a collection of a flatulent spirit or air in



some void space of the body.—Wounds of the head should never be thought trivial, even though they appear but slight, since they have very frequently been attended with fatal consequences.

Wounds of the head should be seldom and then expeditiously dressed : for the whole intention here is to re-unite the divided integuments as soon as possible ; and this is done by self-sufficient nature only, art barely removing the impediments and assisting her action. When all the symptoms therefore denote that the cure goes on well, of what service will it be to undress the wound frequently, and expose the tender growing vessels to the injurious contact of the air ? And besides, that vain shew of diligence by frequent cleansing and wiping the wound with lint, abrades what last grew up. It will be therefore sufficient to dress the wound seldom ; for if any thing is amiss, or if there is so much matter as requires to be cleansed, it may be perceived by the heat and slight itching that will affect the parts :



parts : and the smell will easily discover whether any thing of putrefaction is confined ; or if any malignant symptom arises, it will indicate what more is to be feared or done : *the seldom dressing of wounds in the head cannot be too often inculcated.*

Whenever a contusion, joined with a wound of the head, requires the use of fomentations, we should always use wine, lest a liquor altogether watery should too much relax the parts. For the same reason too, all oily or fat substances are to be avoided in wounds of the head, since they offend not only by over-relaxing, but also, by their rancour and tenacity, they obstruct the small vessels, and render them imperspirable.

A contusion supposes a rupture of many vessels, and an extravasation of their humours, which being afterwards collected in the cellular membrane, often occasion very surprising tumours : and unless the wounding instrument was very sharp, wounds of the head are almost constantly



attended with some degree of contusion. It is therefore necessary here for the extravasated juices to be either discharged, or else disposed to be absorbed again by the vessels; and the ruptured vessels are to be restored to their former continuity. If now the contusion is light, and the extravasated humours are still pervious, they may be then safely dispersed; which may be happily procured by fomenting the parts with such remedies as dilute and attenuate the animal juices, and at the same time prevent their putrefaction, without over-relaxing the solids. The urine of a healthy man, with the addition of a little sea-salt or sal ammoniacum, and some wine, composes an admirable remedy for this purpose; with which the tumours arising from contusions in the heads of children are very frequently and successfully dispersed. The like fomentations are also prepared from rue, scordium, and the like plants, which have a particular antiseptick quality, and prevent putrefaction, at the same time that they powerfully



powerfully attenuate or dissolve such juices as are concreted.

Where the dilating a wound be necessary, the knife is far preferable to sponge, &c. which is generally pernicious, by obstructing the mouth of the wound for some hours, so that nothing can be discharged; whence an emphysema and other tumours are frequently formed: besides, they encrease the contusion and inflammation in the lips of the wound, which will require the suppuration to be continued longer before the wound can be healed.

When new dressings are to be applied, it should be done as expeditiously as possible; first, let the matter be cleared away with soft pledgets of lint, then apply your dressings, and cover up the wound; for a too long or exact inspection of these wounds, as also an imprudent or exact and rough handling of them, abrades the soft mucus, of which are formed the small growing vessels. It will be still more serviceable, if before the wound is



undressed, you place a small tile on each side of it, with some live coals, upon which sprinkle some mastich, amber, olibanum, or the like fumigating substances; thus will the warm atmosphere, full of grateful and corroborating aromatic fumes, cherish and comfort the wound on all sides.

A fracture of the skull differs from a fissure, because in this last the continuity or cohesion of the bone still continues in some measure; but a fracture supposes an entire separation of the parts.

In order to discover a latent, narrow, hair-like fissure, *Ægineta* proposes some liquid black medicine, or ink. But the antients used the juice of the cuttlefish, and perhaps other liquors, for ink; at least the ink which is now in common use, seems not so proper for this purpose, unless very much diluted, since it consists of galls, granate-peels, or the like astringents mixed with vitriol; which, applied to the tender vessels of the naked bone, would so contract them, that the  
lamella



lamella of the bone, its vessels being destroyed, must necessarily exfoliate.

If the bone (which in its natural colour should in general be reddish, or a little inclining to blue) is beset with white specks, it is a sign the subjacent vessels, which coloured the pellucid lamellæ of the bone, are become mortified, and are no longer pervious to the juices they ought to transmit; and therefore an exfoliation must be expected of the bony lamella, destitute of its subjacent vessels.

The famous Ruysch, who was a person of a very large as well as many years most extensive practice in a populous city (*Amsterdam*) says, that in real fractures of the skull, where the symptoms are neither violent nor increase, we ought not to proceed immediately to incision, or the trepan, but that we should first endeavour to undertake the cure by bleeding, and frequent applications of warm cephalick fomentations; and he adds, that he had by these methods only, very happily relieved many patients, when the  
knife



knife was almost ready to be applied.

Fragments adhering to the living parts should be permitted to remain, since there is some hope that they may again unite with the rest of the bone; but if this does not succeed, and it appears from some symptoms that the separated fragments begin to corrupt, they will always either cast off spontaneously, or be removed by art. Whence also it is evident, that it is injurious to be too exact in examining wounds of the head, in order to remove the bony fragments which do not immediately come into view; since, if they adhere to the adjacent living parts, they may unite again, or cast off spontaneously, if they cannot unite; and that nature is of herself sufficient for the cure in these cases, will appear from the following history: A girl of about nine or ten years old, received, among other wounds in her body and arms, about eighteen cuts in her head, all which entered her skull, and some parts of the bones were  
cut



cut off down to the diploe ; and in other parts some of the skull was cut off close to the dura mater. The parts thus miserably wounded, were properly dressed, and the dressing renewed only every two days. In every dressing, fragments of the bone came easily away, adhering to the pledgets ; and those fragments yet adhering to the cranium grew again to the bone, and the spaces were readily filled up, where portions of the whole skull were cut off close to the dura mater ; so that in the space of five weeks this girl was cured of so many dangerous wounds.

A fissure is difficult to discover, and often escapes the strictest examination till it is too late ; especially when seated near the futures, or when it splits the internal table of the skull, without affecting the exterior plate, or when it invades the bone in a part distant from the seat of the wound itself. Add to this, that when the fissure appears visible to the eyes, yet it often runs to a greater length



length than can be safely laid open by raising the integuments. Another reason why fissures are esteemed dangerous, is the uncertainty of knowing how deep they penetrate, whether into the diploe, or deeper. If the fissure of the skull extends to the diploe, there will be very considerable vessels wounded; and the extravasated humours will not be able to discharge themselves through the narrow fissure of the bone; whence they will corrupt and destroy the tender cellular substance of the bone which constitutes the diploe, and by the gradually spreading of the malady betwixt the two tables of the skull, it may corrupt them also: and when once the internal table of the skull is eroded, the encephalon may be affected, so as suddenly to destroy the patient, at a time when it is thought there is no latent danger; but after death the whole bone is found corrupted.—A simple vertigo denotes a slight compressure of the brain only; but a caliginous vertigo shews an encrease of the disorder.—That there is a remarkable consent of parts between



tween the head and præcordia, so as to be mutually affected, is certain; but how this is brought about, is not easily or readily to be accounted for.

A palsy is always a bad sign when it follows upon wounds of the head, because it denotes that the very medullary substance of the brain is injured or compressed.

Suppurations may be formed in the cavity of the skull, and the patient notwithstanding recover. *Ambrose Paré* gives a very remarkable instance of this. A lad had so violently hit his head against a stone pavement, that he was immediately deprived of all sense; a fever, delirium, and other malignant symptoms ensued. On the seventh day a copious sweat and sneezing appeared, and he discharged a large quantity of matter from his mouth, nose, and ears, to the great abatement of all the symptoms; and afterwards recovered.

Many cases in surgery will prove, that, after dividing the cranium and dura mater, the substance of the brain will dege-

nerate



nerate into a surprising excrescence, or tumour. One or two examples will suffice.

A lad of fourteen years old was struck in play with a wooden ball, on the left side of the os frontis; he presently tumbled down, had bilious vomits, and afterwards continued to bring up every thing which he took into his stomach. Continuing still in a very bad way, the skull was trepanned about two months after he had received the hurt; a purulent matter immediately forced its way out through the opening, and afterwards the substance of the brain itself began by degrees to protuberate; nor could it be confined; the luxuriant part therefore was cut off by tying a thread round it. Soon after a like fungous substance arose again to the height, of three fingers breadth; which was again removed in the same manner. And this was so often repeated, that all the fungi together would equal the size of one's fist; yet the patient was afterwards cured. 2 A lad



A lad of seven years old received a violent wound upon the right parietal bone by a fall from a horse. On the fifth day, a fungus grew out of the fractured bone to the length of a thumb, and the thickness of a finger; the parents were unwilling to permit an accurate inspection of the wound, or to suffer an elevation of the depressed skull; and continually affirmed, they had rather their son should die with little pain, than undergo the torture of a cruel operation, the event of which was uncertain. Hence the physician and surgeon were obliged to use hardly any thing but desiccatives to remove the fungus. And thus the fungus continued almost unaltered for three whole months; but in the mean time the symptoms, which at first were very malignant, were now become very mild and almost removed: all the animal, vital, and natural actions of the body were restored, insomuch that the child grew lustier, and spent his time in play as usual. About the beginning of the fourth month,



month, the fungus encreased very much, but was taken down by sprinkling on a powder *ex euphorbio & alumine usto*; but within the space of twenty-four hours, another fungus grew up to the bigness of a hen's egg, with an encrease of all the bad symptoms. In this fungus was perceived a strong pulsation of the artery, and by roughly handling, it bled very copiously. In vain was the reduction of this luxuriant fungus attempted by corrosives, and therefore the surgeon tied a thread round the narrow neck of the tumour; but then there arose so violent a pulsation in the arteries of the fungus, that the whole body of it seemed to leap up. But this method of constriction by ligature was continued, and the greatest part of the fungus dropped off with the ligature, smelling intolerably; the remains of the fungus appearing black, fordid, and quite corrupted, afforded a lamentable sight, and was followed with convulsions, tremblings, and a palsy of one side. Yet did this corrupt part of the fungus separate



rate in a few days after; but then another fungus of an ash colour arose to the size of a walnut, without giving any pain; and a manifest pulsation was perceived in the arteries dispersed through the substance of this fungus, which, emerging out of the wound, separated spontaneously in a few days, and left a large sinus or cavity behind, in the substance of the brain. In two days afterwards, the cavity was in one night's time filled with a new fungus; and in a few days after, the miserable child being terribly convulsed and distorted for two whole days, then expired in the fourth month after the wound had been received; but all the senses, speech, and reasoning faculties continued even till death.

This surprising history teaches us that fungous excrescencies of the brain are vascular, dilate surprisingly to a considerable bulk, and arise again very suddenly even after they have been removed. In the body of this child, it was observed that the cortical substance of the brain was

I

quite



quite consumed in the place wounded, and all its surface was covered with a large quantity of matter.

Large wounds of the head, in which there is a fracture of the skull sufficient to discharge the extravasated humours, are often less dangerous than small wounds of the head, where the extravasated humours are confined under the skull. *Hippocrates*, enumerating the signs of malignity in wounds of the head, joins these three symptoms together, viz. a *dimness*, *vertigo*, and *falling down*. And in another part of his writings, he admonishes us in all considerable wounds of the head to ask whether the patient tumbled down and fell into a deep sleep, or stupefaction; for if any thing of this kind happened, the greater care will be required in the cure; he then adds as a reason why this question is necessary, not that it always denotes the brain to be wounded, but because the encephalon is then in some degree sensible of, or injured by



by the wound—*τὸ ἐνκεφαλὸς στακισαντος τὸ  
τρωματος.*

The dura mater firmly adheres to every part of the skull; but then its adhesion is found so strong in the futures, that they can scarce force it up by the interposition of an iron wedge. It is therefore evident that if the trepan was to be applied upon a future, the round piece cut off from the bone could not be removed without greatly lacerating the dura mater, which might produce intense pains, convulsions, and other malignant consequences. Hence, by the consent of all authors, the futures should ever be avoided, and the perforation of the bones rather made on each side the future than on the future itself.

A wound will hardly ever be brought to cicatrize which has penetrated into the frontal sinus.

Extreme hot air and freezing cold are always highly pernicious in wounds of the head; but the temperature of the spring is most serviceable.



*Of Wounds of the Thorax.*

**I**N all wounds of the thorax the first enquiry ought to be, whether they have penetrated into its cavity or not? or whether the air rushes impetuously through the wound; which the surgeon may easily know by compressing or closing the lips of the wound with his thumb or fingers, so, as that no air can enter or return by it: he then orders the patient to inspire as much air as he well can, and to retain the inspired air in his lungs by shutting the larynx; and then before the patient breathes out the air, he places a wax candle opposite the wound, and suddenly opens its lips; if now any air entered into the cavity of the thorax, it will be forcibly blown out through the wound, so as to move the flame of the wax candle.

A thin dew or moisture is continually exhaled every moment of life from small arterial ducts, which open throughout the whole



whole surface of the lungs and pleura, and prevent the concretion of one with the other. This circumstance is beautifully observed by *Hippocrates*, when he says, "Every part of the body which is not solid or grown together, but lined either with skin or flesh, is hollow in a healthy state, replenished with vapours, but in a morbid state contains ichor." If water injected into the mouth of a wound with a syringe excites a cough, and is discharged through the wind-pipe, we may know the wound has entered the lungs, without penetrating into the cavity of the thorax.

The best dressings for wounds of the thorax are flat pledgets of lint, spread with some vulnerary balsam, or soft digestives, according to particular circumstances; over these to apply a plaister not too tenacious, and perforated with several small holes, applying at the same time a convenient bandage, if necessary; being cautious however not to compress the mouth of the wound by the compresses



and bandage, so as to hinder the discharge of the extravasated humours.

Great caution is necessary to determine whether the wound has penetrated into the cavity of the thorax; for the cavity ascends much higher before than behind, where it descends lower; gross errors have been thence committed, when, thinking a wound to have penetrated the thorax, it has in reality entered the cavity of the abdomen.

Emphysematous swellings denote the lungs to be injured; for in that case the blood flowing from the wounded blood vessels into the air vessels of the lungs, by mixing with the air it will become frothy, and therefore frothy blood will be coughed up from the wind-pipe, or else the same blood will run in spurts from the external wound.

The patient's lying easiest on his back, it being very uneasy for him to lie on the wounded side, and impossible for him to lie on the sound side, is a symptom of very great moment: for the diaphragm



phragm descending, or being continued lower on the back part of the body, much encreases the capacity of the thorax; so that the blood extravasated within the capacity of the thorax will naturally subside to the lower and back part of the thorax when the patient lies down; and the back part of the diaphragm will descend more easily, for the middle of it is tendinous, to which the broad basis of the pericardium strongly adheres, and therefore cannot easily be depressed; from whence it is evident, that the extravasated blood will be lodged easier in this posture than in any other. But when the patient lies on the injured side, the posture of the body will be more painful, though tolerable; but if the patient lies on the sound side, the weight of the extravasated blood will press the mediastinum and pericardium towards the other side of the thorax, whence its capacity will be diminished, and the difficulty in respiration encreased; which the patient in this posture no sooner perceives, but he immediately changes it, or turns



himself even against his inclination, to avoid being suffocated.

When we know the seat of the wound, and the course of the wounding instrument through the parts, we can then tell from anatomy whether or no any large artery or vein be injured. Thus the larger trunks of the intercostal arteries run near the lower margin of the ribs; those of the internal mamillary are placed near each side of the sternum, at about the distance of a finger's breadth from that bone, behind the cartilages of the ribs; the large vena azygos is seated on the right side of the vertebræ of the back, &c. From a thorough knowledge of all which, the wound is determined more or less dangerous.

The diaphragm ascends higher in the right side of the thorax; therefore when the paracentesis of the thorax is made on the right side, it is usually performed betwixt the third and fourth ribs. But when on the left side, between the second and third of the spurious ribs, the  
opening



opening ought to be next made with a knife, or some cutting instrument, not with a pointed one as in the paracentesis of the abdomen, which is made by a steel bodkin included in a silver canula, because there would be great danger of wounding the lungs by such a puncture.

It appears from physiology, that it is necessary there should be no air in the cavity of the thorax, in order for the free expansion of the lungs by inspiration: now this discharge of the air may be procured either by suction, or by the method following, which is the best of any. Let the lips of the naked wound be pressed together by the fingers in such a manner as that no air can enter, and then let the patient draw in a large quantity of air into his lungs by a deep and long inspiration, and let him retain this air as long he is able: now the air thus retained being rarified by the heat of the parts, will expand the lungs, and compress the air lodged betwixt the lungs and the pleura. If then the lips of the wound are opened,



ed, or drawn asunder, a great part of the air confined in the thorax will be expelled: after this the lips of the wound are to be immediately closed again, before which the patient must not expire. By repeating this method several times, the whole quantity of air may be entirely expelled from the cavity of the thorax, and the patient will directly perceive, that he can breathe much more commodiously. All the air being thus expelled, let a sticking plaister be immediately applied at the instant when the patient retains the inspired air in his lungs; at which time the lungs being distended, and contiguous to the pleura, will obstruct the passage of the air about to enter through the wound. This plaister is to be continued upon the parts for a very considerable time; and when it is necessary to renew the dressings, another sticking plaister of the like kind is to be applied with the same precautions. And if the seldom dressing of a wound is ever useful, it must be certainly so in these wounds of the thorax.

*Of*



*Of Wounds of the Abdomen.*

ALL wounds injuring the containing parts of the abdomen without dividing the peritoneum are called not penetrating, as those which have perforated the peritoneum are said to penetrate into the cavity of the abdomen.

Wounds not penetrating the abdomen have a circumstance peculiar to themselves, which, being neglected, has often produced an ugly train of bad consequences; for the diaphragm being depressed at every inspiration, all the contents of the abdomen are thereby compressed, and again, in expiration they are repressed by the abdominal muscles; whence it is evident, that the contents of the abdomen receive a continual pressure from the diaphragm and muscles of the abdomen. If therefore the equality of this pressure be removed in any part, by a wound in the integuments extending almost to the peritoneum, that membrane  
being



124 *Of Wounds of the Abdomen.*

being easily dilatable, will be extended by the force of respiration so as to form a sacculus, into which the intestines, omentum, &c. may enter, and form an hernia, which is no more than a dilatation of the peritoneum in some part, into which the contained viscera of the abdomen may prolapse and enter; for it is very rarely, if ever, that a hernia is formed by a rupture of the peritoneum, but almost constantly from an expansion of that membrane into a sacculus, notwithstanding *Celsus* seems to have been of another opinion; and we are taught by most certain observations, that ruptures may be formed in any part of the abdomen where the equable pressure is removed from the peritoneum.

Narrow and deep wounds of the integuments easily degenerate into fistulæ; and therefore care must be taken by an artificial pressure, and a proper posture of the patient, to prevent the confined humours from forming sinusses in the panniculus adiposus. But the broader sort of wounds in



in the integuments very much endanger ruptures; whence it will be proper to unite them by future, and to secure the weakened part by an artificial application of compresses and bandages, that the contents of the abdomen being pressed there may not dilate the peritoneum. Wounds of the mesentery, without injuring any other parts, cause the most excruciating pains of the abdomen, and generally prove fatal in two or three days; it appears to be probable that these symptoms arise from the nerves of the mesentery being injured.

A discharge of bile from a wound of the abdomen is a very bad sign.

It has been observed that no stench (which is the sign of incipient putrefaction) is perceptible any where more than in the cæcum, colon, and rectum; but never in the small intestines. When the fæces therefore are discharged thro' the wound, or when their fetid smell emits through it, we may conclude the large intestines to be wounded.



*Of Contusions.*

**A**LL the disorders which follow in consequence of contusion are reducible to three heads; from a rupture of the solids, and an extravasation of the fluids, which destroy the functions resulting from the determinate motion of the juices through the uninjured vessels; from the pressure of the extravasated humours, collected in some natural or præternatural cavity of the body, and by their bulk disturbing or abolishing the functions of the adjacent parts; or, lastly, from the putrefaction of the stagnating and extravasated juices, which may acquire an acrimony sufficient to corrode and destroy the circumjacent parts.

When the pressure of the atmosphere on the surface of the body is either diminished or wholly removed from any part either by suction, the application of cupping glasses, or the like, the blood then rushes into the vessels of the part  
less



less pressed, and distends them, so as to enter many of the smaller dilated vessels, which did not naturally contain any red blood; and the red parts being impacted in these vessels, without being able to return, give the appearance of a red, livid, or often of a blackish spot. Such a spot being formed in any part by suction, the part is said to be blood-shot; but when a part being bruised with a hammer has its blood vessels suddenly compressed by the stroke, the blood being pressed forward into the lymphatic or serous vessels, will change their colour and produce a very considerable spot of this kind. Blood-shot therefore differs from an ecchymosis, inasmuch as the blood is strongly pressed into the serous vessels without any rupture in the former; but in an ecchymosis the vessels being ruptured, the blood is extravasated into the adjacent spaces; whence the former of these takes place, rather about the circumference than in the middle of the contused part. But it is very evident, that  
both



both blood-shot and ecchymosis may both of them follow after violent contusions; whence they are frequently confounded by authors without distinction.

The viscera contained in the cavity of the thorax are on all sides securely defended by the arched ribs, the sternum, and spina dorsi; the abdominal viscera are more liable to be injured by contusions, since they are for the most part covered only by the soft integuments and muscles of the abdomen; and tho' the spleen and the largest part of the liver, are defended by the false ribs, yet have these viscera been sometimes so violently crushed by contusions, that death itself has speedily followed; nor will this appear wonderful, if it be considered that the substance of the liver and spleen is so tender, that, unless great caution be used, they cannot be taken whole out of the dead body; hence it is, that violent contusions of the abdomen so often prove suddenly fatal.

Among



Among ten cases where the breasts are scirrhus or cancerous, nine of them arise probably from contusions. If no inflammation nor any great pain appears in the contused part, gentle frictions are extremely useful; for by this gentle agitation, the concremented blood is attenuated and divided, so as to be capable of returning through the small mouths of the bibulous veins.

Recourse ought not to be had immediately to amputation, since we find disorders, though seemingly altogether desperate, have sometimes been happily cured without it: therefore, it seems to be most advisable always to try every other method where it may be safely done; and we are furnished with several remedies, by which the parts, tho' even mortified, may be so preserved, that the putrefaction will not easily spread; we may safely wait a few days to see whether nature will attempt a separation, or whether any symptoms appear of life returning again into the part.



*Of Fractures.*

**S**URGEONS usually distinguish fractures into three species, viz, *simple*, *compound*, and *complicated*. A simple fracture is said to be, when a single bone is only fractured in one place, without any considerable injury of the incumbent or adjacent parts. But when such a fracture happens in any part of the body, where two large bones lie close on each other, as in the cubitus, if the radius only be fractured, without injuring the ulna, that species of fracture is then termed incomplete by some surgeons: because the situation of the parts is not then much disturbed, and the limb retains its proper length; but when the ulna and radius are both fractured together, or the tibia and fibula in the leg, they then call the fracture complete, or even compound; though it would seem that a fracture may be termed compound,



pound, where a single bone only is fractured in several places. But when a fracture of one or more bones is also attended with symptoms that require a distinct treatment, such as a wound, ulcer, &c. it is then termed complicated, because a particular regard must be then had to those concomittant disorders, during the cure of the fracture.

A fracture in the upper part of the thigh-bone, near the hip is seldom curable, without leaving some defect in the motion of the limb; but when the same bone is fractured in the middle, or towards the knee, there are much greater hopes of obtaining a happy cure. This seems to follow, because the higher the fracture of the femur, the greater number of muscles draw up the lower part of the bone; and as those muscles are very strong, they require a very forcible extension, in order to reduce the fractures, which are then also very difficultly kept in contact.



The most disagreeable accidents that usually happen in consequence of fractures seldom proceed from the injury of the bone itself, but from the injury offered to the adjacent soft parts, which are compressed or wounded by the fractured bone.

That kind of fracture is of all the best, which is termed transverse or raphanoide; especially if the fragments as yet sustain each other, and are not quite displaced. But the cure of an oblique fracture is much more difficult; because in that case the fragments do not mutually sustain each other, and they are very easily displaced or removed from their contacts by the contraction of the muscles fastened to the bones; nor is it easy to secure the parts so by bandage, as that the fragments shall continue in their proper places after they have been reduced. *Celsus* very judiciously observed this. “Of  
“ these fractures, the most tolerable is  
“ the simple and transverse, but it is  
“ worse when the fracture is oblique, and  
“ when there are fragments; and the  
worst



“ worst of all, when those fragments are  
“ sharp pointed.

*Hildanus* says, that the consolidation of fractured bones succeeds very difficultly in women with child; for nature being fully employed in forming and perfecting the fœtus, in a manner neglects to form a callus.

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## Of Luxations.

A Luxation has by custom been restrained to signify only the displacing bones from their articulation where they naturally resided. *Ægineta* gives an excellent definition of it. “ It is, says he,  
“ the slipping out of the head of a bone  
“ from its proper cavity, into some im-  
“ proper place, whence the voluntary  
“ motion thereof is obstructed.”

There is a threefold humour in the cavities of the joints, the universally perspiring vapours, the medullary oil, and the mucilage separated by the glands



there seated ; from all which, mixed together, arises that lubricating liniment, which being attenuated by the warmth and mutual attrition of the bones, is returned, or absorbed in the same quantity in which it was sent into the joint : but if the return or absorption of this liniment be impeded or diminished, by any cause, the secreting and expulsive causes still remaining, the liniment will be then so accumulated as to distend and weaken the ligamentary capsule of the joint ; whence the prolapsion of the articulated head of the bone from its proper cavity may easily arise.

The chief signs of a luxation are a præternatural tumour from the head of the bone being displaced into some other part with an unusual cavity in the place where the head of the bone was naturally seated. But that the diagnosis may be more certain, both these signs should be present ; for either of them alone is often found fallacious.

Rest



Rest is always necessary to restore the strength of the over-strained ligaments, or to procure an union of them if they are broken; but care must be taken not to let the ligaments become rigid by too long a rest, nor to give rise to an ancylosis by an accumulation of the mucilage of the joint, which may become inspissated for want of motion. Hence it is adviseable to gently move, and rub the joint, for some days after it has been dislocated, provided all the pains are abated, and there is no danger of an inflammation, as *Hippocrates* very carefully remarks, in treating of the cure of a luxation of the humerus. And *Celsus* observes, that this caution ought more especially to be taken notice of in a dislocation of the elbow: “The dressings are to  
“be speedily and often removed, the part  
“is to be well fomented with warm water, and to be rubbed for a considerable  
“time with oil, salt, and nitre; for a  
“callus is sooner formed in the cubitus  
“than in any other joint, whether it



“ remain displaced, or reduced to its  
“ proper situation. And if it should  
“ grow by too long rest, the flexibility of  
“ the joint will be afterwards destroyed.”

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*Of Inflammation.*

**T**HERE are two concurring causes, which together constitute the nature or existence of inflammation, namely obstruction, with an encreased velocity of the blood flowing into the obstructed vessels; for the blood stagnates in an inflammation, and cannot pass through the smallest vessels, even though it be urged forward by the impulse of the succeeding blood.

A true phlegmon is almost constantly seated in the smallest sanguiferous arteries, or else in the serous arteries dilated. In the blood there is always a tendency towards concretion, which is the stronger in proportion to the stronger action of the  
the



the vessels upon their contained blood; for the blood of strong men taken from a vein immediately congeals, and after standing a while at rest, exhibits much cruor or crassamentum, and but little serum: the contrary of all which we observe in the blood of a weak girl. But all this depends on the more or less powerful action of the vessels upon their contained blood. But by an encreased motion, the action of the vessels in a given time is more frequently and strongly repeated upon the contained fluids, by which means they acquire a greater condensation or compactness. Besides this, by an encreased motion the most fluid parts are dissipated, because a greater quantity of blood is applied in a given time to the organs, which from thence separate and discharge the thinner juices: and from hence again the tendency of the blood to concretion will be augmented. Add to this, that an encreased motion is followed by an encrease of heat; from whence likewise the blood may be

so



so inspissated, that it can no longer pass through the narrow extremities of the smaller arteries. And therefore in acute diseases, when the heat is much encreased, the injured function of the brain and the difficulty of respiration immediately denote that there is such an inspissation of the blood, that it can no longer pass freely through the narrowest passages of the smaller arteries in these viscera.

The saliva does not concrete with the heat of boiling water; hence it appears to be thinner than the serum of the blood. A copious discharge by spitting will therefore drain off a great part of the thinner juices in the body, which the blood being deprived of, is rendered by that means less pervious or fluid. Those who by an ill custom or an abuse of tobacco, daily discharge great quantities of their saliva, are for that reason so often afflicted with the worst kinds of obstructions in their abdominal viscera.

The



The seat of a true phlegmon is most generally in the membrana adiposa.

An erysipelas and a phlegmon differ only in the magnitude of the obstructing particles; for in a phlegmon the red part of the blood is accumulated in the obstructed and distended vessels; but in an erysipelas, the serum of the blood, mixed with a little cruor, becomes impervious in the same manner: besides, the seat of a phlegmon is chiefly (as was said before) in the membrana adiposa, whereas an erysipelas invades either the external integuments of the body, or the internal membranous parts: the dilating vessels admitting a larger quantity of the red blood, and spreading the disorder into the adipose membrane, may change an erysipelas into a phlegmon.

An inflammation seated in the smallest lymphatick arteries we call an *œdema calidum*. In this case there will always be danger, the thin lymph of the blood acquiring such a cohesive disposition, as may render it impervious and apt to obstruct



struct its small vessels ; from whence the functions of the brain more especially may be disturbed, as they depend on a free circulation of the finer humours through the smallest arteries, whether this disorder be originally formed either in the encephalon, or by a translation from some external part inwards. If this disorder is violent, the smallest vessels being destroyed may incline the parts to a sudden gangrene.

Two causes are observed to occur in every inflammation seated in any series of the arteries ; namely, an imperviousness of the fluids, occasioned by a narrowness of the vessels, or a concretion of the particles ; or else from an *error loci*, and the propelled humours being at the same time urged forwards with an encreased velocity into the impervious vessels by the *vis vitæ* acting behind them. If these concur, an inflammation is present ; but if there is only an imperviousness of the fluid, it affords the idea of an obstruction ; which last is therefore the predisposing



disposing or proëgumenal cause of inflammation, while the procatartick or accessory cause is the encreased motion urging on the back of the obstruction. But while these causes act, certain changes are produced in the enflamed part, which being observed, afford the true diagnosis of a present inflammation.

Our blood when at rest separates into two parts, the one a red concrete, and the other a watry serum, in which the red part swims : but there are two causes in the body which prevent this concretion ; namely, a continual motion, and the interposition of a thinner fluid betwixt the red globules, by which they are removed from their mutual contacts.

We perceive pain in an inflamed part, which was not there before, because the blood thrown into the obstructed arteries by the force of the heart, will spend all its force in removing the sides and extremities of those arteries ; and from thence the sides of the arteries will recede farther from their axis ; and when the force of

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the heart ceases, they will return or contract again with so much a greater force, in proportion as they were more distended. The pulse will be therefore thus encreased in the inflamed part, and being raised in strength and velocity beyond its natural action, it will be very distinctly perceived.

Thirst, heat, watchings, &c. do not always attend every inflammation, but only when the whole mass of blood has acquired such an inflammatory spissitude, that it cannot pass through the smallest vessels.

A phlegmon is a red tumour, tense and shining, with a pricking pain, heat, and pulsation, accompanied with a fever, either in the whole, or at least in a particular part of the body.

An encreased motion of the humours is not only prejudicial, inasmuch as it may break the continuity of the obstructed vessels, but also as it compacts the obstructed particles together with a greater force. But to disperse an



inflammation, it is required to resolve the obstructing concrete into those small particles, by whose combination the obstruction is formed: but the more the thinner humours are expressed which prevent the mutual contacts of the grosser particles, so much the more strongly will these last be united and pressed together, the more firmly will they cohere, and the more difficult will it be to dissolve them again. Hence it appears why the most skilful physicians despair of a resolution in a pleurisy and such like other diseases, in which a most violent fever has attended for above twelve hours time, and rather direct all their curative intentions to promote the concoction and excretion of the inflammatory matter.

When the most fluid parts of the blood are dissipated in the beginning of acute diseases, either by sweats, diarrhœa, or any other evacuation, there is always great danger of a fatal event: for the grossest particles of the blood are not prevented from concreting or touching each other



other but by the interposition of the more thin humours.

A suppuration is that salutary effort of nature, by which she separates every thing which is become unfit for receiving the vital circulation from the other sound and living parts.

When the influx of the vital fluid into the arteries and its return thro' the veins is from any cause destroyed in some soft part of the body, it occasions the death of that part; which from its beginning to its formation is termed a gangrene. This manner therefore of terminating an inflammation differs from a suppuration, inasmuch as all the motion of the humours is entirely destroyed in the affected part, by a sudden rupture of its small vessels; whereas in a suppuration, the obstructed extremities only of those vessels are gradually separated, by the motion of the vital humours pressing on from behind.

Any very sharp substance or liquor applied externally to the body, whether it be acid, alkaline, or of any other species of acrimony will cause a gangrene.

All



All inflammations are dangerous when attended with a violent fever. A sudden cessation from pain in violent inflammations give great room to suspect a gangrene. The most intense cold will intirely impede the circulation of the humours by congealing them, and by contracting the vessels; whence a sudden mortification of a part often happens in consequence of a severe frost: but when the *vis vitæ* is capable of removing the obstructions in the benumbed part, then an intense heat arises from an attrition of the more condensed humours through their contracted vessels; which last is a thing frequently experienced by those who have been rubbing their hands with snow, when the uneasy sensation of cold is soon followed by an intense heat. Hence it is evident, that the application of cold things to an inflamed part must be prejudicial; inasmuch as they totally interrupt the circulation, or inasmuch as they excite a more intense heat afterwards in the parts which are already too hot. But sometimes the ap-

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plication of cold things may be serviceable, when the grosser parts of the humours have entered the smaller vessels by an *error loci*, as these vessels, being contracted by the cold, may repel the matter back into the larger branches; and this more especially when the disorder is seated in the thinner fluids, since the red part of the blood immediately congeals in cold water, but the serum and thinner lymph does not. But it is easily apparent that no good can be expected from the application of cold things, when the disorder is recent, and at the same time mild; for if the obstructing matter of the inflammation be so impacted in the smallest extremities of the vessels as to be quite stagnant, it will rather increase the disorder. The use of revulsions in diseases is confirmed by daily experience, as well as by reason; for so soon as the resistance to the blood's motion is either diminished, or totally removed in any part of the body, it immediately flows, or is derived into that  
part



part with a greater velocity. Thus if an artery, even but of a moderate size, be divided, all the blood will flow thro' that vessel which does not resist. When all the vessels and viscera of the abdomen are suddenly freed from a considerable pressure by the birth of an infant, all the blood is frequently derived into those vessels so forcibly, that unless the flaccid vessels and viscera be compressed by swathing with a roller, the child-bed woman may suddenly perish in a fatal syncope for want of the blood's due pressure in the vessels of the brain and cerebellum. The same thing also happens if the abdomen is not swathed, when all the water is discharged at once by paracentesis in a dropsy. It is therefore evident, that by diminishing the resistance in any part of the body, the blood will be derived thither more forcibly and plentifully. But the fulness of the vessels, and the strength of their coats, resist the impulse of the blood from the heart, which are impediments to their dilatation; and there-



fore every thing which lessens the fulness of the vessels, or occasions their sides to yield more easily to the distending blood, will derive the humours more powerfully and copiously into that part. If again we consider, that the blood propelled by the heart is sent partly upwards to the head, and superior parts of the trunk, and partly downward to the lower extremities and viscera, it will appear evident, that by diminishing the resistance of the lower vessels, or by evacuating them, the quantity and impulse of the blood will then be derived more towards the inferior parts, and driven back from the upper. It is therefore possible to make a revulsion of the arterial blood from an inflamed part to any other; especially when the part, towards which the revulsion is made, receives its blood from the same common trunks or larger arteries.

A cool air conduces much to moderate the swiftness of the circulation of the blood. But a dry air is to be preferred



ferred, *cæteris paribus*, before a moist air, which last, if cold, may cool the blood too much.

The more firm and elastic the vessels are which have been distended by an inflammation, the sooner do they return to their former shapes and dimensions; and, on the contrary, more time is required to restore the strength of the vessels in proportion as the inflammation is seated in a lesser series of them.

A resolution only can be properly called a complete cure of an inflammation, which it removes without inducing any other disorder; whereas the other ways of terminating an inflammation cannot be said to make a complete cure, since they introduce an abscess or scirrhus, even though they remove the inflammation; for in this case there is another disorder introduced, which will require its particular cure, before the parts can be restored to their healthy state. But when an inflammation terminates in a gangrene, or a sphacelus, it does not



then conduce to a cure, but the death of the parts.

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*Of Abscesses and Fistulas.*

**I**NFLAMMATION is most undoubtedly best cured by resolution. So long as the material cause of a disease continues of such a nature, as to either continue or increase the distemper, it is termed *crude*; but when it has been so altered by the remaining *vis vitæ*, its own natural disposition, or the use of proper remedies, so as to be less remote from the laws of health, and to produce less disturbance in the functions of the body, it is then said to be *concocted*. *Crudity* is known by the intensity or increase of all the symptoms, but *maturation* by the remission of them.

The maturation of all crude inflammatory matter into concocted pus, must be performed by the remaining *vis vitæ*; for when that is languid or defective, no matter is formed; and there-



therefore *Hippocrates* reckoned the appearance of dryness in an ulcer, either before or in a disease, among the signs of death. It is also from a weakness of the vital powers, that the spitting is diminished, or even frequently quite ceases in the latter end of a pulmonary consumption; but the *vis vitæ* is estimated by the force of the circulating humours through the vessels; and as the obstructed ends of the vessels with their impervious contained matter, are to be separated by the impulse of the humours acting from behind, it is evident that this separation will be sooner performed, if the strength and swiftness of the blood's motion is increased through the vessels of the part to be suppurated; for then the circulating fluid will strike more frequently and strongly, in a given time, against the obstructed ends of the vessels, and separate them sooner from their cohesion. But it is to be observed, that too great a velocity of the humours suddenly excites a rupture in the vessels, and does



not procure a gradual separation of their ends, in which case a gangrene follows instead of a mild suppuration. When clean and laudable matter is too long confined in an abscess, it loses its unctuousity and balsamick thickness, by which it almost resembles the cream of milk, and is changed into a thin *ichor*; but this great tenuity, arising from putrefaction, is always accompanied with a greater acrimony; the whole internal surface, therefore, of the cavity in which the attenuated and acrid matter is confined, will be continually macerated and corroded by the sharp *ichor*; the ends of the small vessels will be dissolved, and their extravasated humours acquire the same kind of corruption, so that the sides of the containing cavity being continually eroded, the sinus of the abscess will be always increasing, and the quantity of matter enlarged by the humours derived thither from the eroded vessels.

I have seen, for want of discharging the matter which was formed by a suppuration



puration of the parotid gland, that it has made itself a passage downward through the *panniculus adiposus* of the neck to the shoulder, arm, and even to the bending of the elbow, insomuch, that the ligaments which connect the articulation of the elbow were so corrupted, as to produce an incurable anchylosis. An abscess was formed after a deep inflammation round the articulation of the *femur*; and as the pus concealed under the large muscles could not be evacuated, it descended and formed a sinuous ulcer, running through the whole length of the thigh and leg, whence the robust youth was destroyed by a purulent cacochymia, after suffering the most tedious affliction, and trying all means to no purpose. If now we farther consider, that this matter collected in the cellular membrane attenuated by the warmth and stagnation, often lies under strong muscles, it is very evident, that being pressed by the motion of those muscles, it may be propelled through



through all the adjacent parts, and by that means produce sinusses and fistulæ of the worst kind, more especially when the matter lodging in the *tunica adiposa*, insinuates itself betwixt the muscles themselves. Now as the *tunica adiposa* is of a greater thickness, or as there are a greater number of strata of muscles lying over each other above the suppuration, so much the worse sinusses may be formed by the too long confined pus. And hence it is that such troublesome fistulæ and sinusses are sometimes observed in the abdomen, by reason of the great quantity of fat, seated and interposed betwixt the several strata of the abdominal muscles.

There is no part of the body in which there are worse fistulæ and sinusses formed, by matter being too long confined, than about the *intestinum rectum*: for as the grossest fæces must pass through that intestine in order for their discharge, it was necessary that it should be capable of an easy dilatation every way; and therefore there is



is a large quantity of soft fat placed all round this intestine, into which the confined matter, which has been too long retained in an abscess, may penetrate and form sinusses: if now the *rectum* itself is also corroded, the matter may spread itself through the cellular membrane, and mucilaginous cryptæ, &c. of that intestine, so as to produce most tedious maladies, which are still much encreased by the foulness of the intestinal fæces which are to pass this way.

A *fistula* differs from a *sinus*, in that it is narrower and generally of a longer standing, having its orifice and internal surface frequently covered with a callus.

They are generally seated in the *panniculus adiposus*; it being not only continued round the muscles and tendons, but also inserted betwixt the subdivisions of the muscles into their lesser portions, even as far as the eye can trace them. From whence it is evident, that sinusses and fistulæ may often turn and wind in a surprising manner, and often penetrate  
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to a very great depth from their opening, as has been frequently observed by surgeons of the most eminent practice and knowledge.

The cure of all fistulas and sinusses requires in general, 1. That a free passage be procured to the matter, and to prevent its long stagnation, so as to corrupt in the sinus or fistula. 2. To cleanse or deterge the internal surface of the cavity of the sinus or fistula, and to reduce it to the state of a clean wound. 3. To bring the separated parts, now clean, into contact, and retain them so as they may grow to each other.

If the orifice of the sinus or fistula is so placed, that the humours contained in its cavity cannot discharge themselves by their own weight, the cure is always difficult; for they will be accumulated, and increase the præternatural cavity.

The injection of deterfives are only serviceable, as they remove the fordes, and consume the callosity of a fistula; but after the parts have been depurated, they will



will be rather injurious by preventing their union; the whole internal surface may be known to be clean, if it discharges a white, smooth, and uniform matter, without any sanies or ichor, and without any fetid smell.

If we consider the situation of the inguinal and subaxillary glands, they will appear to be well adapted to receive an afflux of humours, which ought to be discharged from the whole habit; for they are placed in the very soft adipose membrane, almost free from all muscular compression, having very large arteries, veins, and nervous trunks near them, from which they receive their branches. But these glands have so great a commerce or consent with the other branches of these nerves, that when they are injured, these glands are often immediately inflamed and swelled. Thus have I frequently seen a very painful paronychia produce a sudden tumour in the axilla, even though the disorder was seated in the end of the finger. When a  
woman



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woman unfortunately run a needle up under her nail, so as to injure the nervous substance which is there seated, with the most acute pain, I was surprised to find that in a quarter of an hour after there was a considerable tumour in the armpit of the same side.

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*Of a Gangrene and Sphacelus.*

SO long as the soft parts only are in a dying state, or are actually dead, the case is called a *gangrene*, which has its seat principally in the *panniculus adiposus*; but when the muscles, the tendons, the ligaments, the periosteum, or the bones themselves, are absolutely mortified, then the case is termed a *sphacelus*. The cause which produces either of them, is, nevertheless, still the same, namely, whatever takes away or destroys the influx, efflux, secretion, and excretion of the humours in any part of the body.

It is frequently a difficult matter to determine about the existence of a *sphacelus*;



celus; for the *panniculus adiposus*, if violently inflamed, oft becomes immensely thick, even in those places where there is very little fat; as, for instance, in the back of the hands and feet, and in the fingers and toes. If now a gangrene seizes on those parts, the instrument may be thrust down very deep, without any sense of pain. The *panniculus adiposus* also when distended, and confined within a whole skin, may so compress the parts underneath it, as to take off from the quickness of feeling, or even to make them insensible; though as yet they may not be quite dead, but capable of reviving again upon the removal of the pressure; so that we cannot conclude that there is an actual sphacelation, unless we be very sure, by the deepest punctures or scarifications, that no pain can possibly be produced: for if there be any life remaining in the parts which lie under the *panniculus adiposus* when gangrened, we may reasonably expect a separation of the part corrupted.



All skilful surgeons very justly suspect the swift progress of the increasing disorder, and more especially if the gangrene has arose from internal causes, without any external injury.

The winter season is most prejudicial to gangrenes, proceeding from the motionless state of old age; and the summer heat most noxious, when the like disorders follow after violent inflammations, or the putrefaction of humours, and more especially if the constitution of the air be at the same time both hot and moist.

A gangrene of all the viscera is not always absolutely mortal; for if they happen to a solid and membranaceous substance, as the intestines for instance, where the separation of the gangrenous corrupted parts, from the parts that are sound, be not only possible, but capable of being conveyed out of the body, the patient shall frequently recover, of which many instances may be met with in practice.

If after violent inflammations, or any remarkable hurt of the bladder, by wounds,



wounds, dilacerations in drawing out a stone, &c. a gangrene follows, the event is always very bad; partly from the sharpness of the urine, which, as it is continually falling upon the part thus affected, must increase the putrefaction already formed, and partly from the large quantity of nerves dispersed over the bladder, by which means the brain and the whole nervous system is surprisingly affected.

If in an acute disease, either the humours, when grown impervious from their inflammatory density, or adhering by an *error loci* in vessels which do not belong to them, so obstruct the very tender vessels of the brain, whereon life and being depend, as to take away all vital influx or efflux, the consequence will be sudden death; nor can scarce any sensible defect be possibly discovered, as the parts are too small to fall under the notice of our senses: neither is it a matter of importance, whether the distemper first seized on these parts, or the

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inflammation originally begun in other parts of the body, and was translated to the brain. Thus a pain in the thigh in a continual fever, which has suddenly disappeared, was succeeded by a phrenitis, which carried off the patient in three days.

As this disorder frequently arises from the scurvy, 'tis usual to wash the mouth often with spirit of scurvy grass, treacle, and such like medicines; but these are almost always disserviceable. If the case be slight, and in its earliest stage, (which is known by the redness, heat, and pain, and no fetid smell) sal ammoniac, or nitre, diluted with a large quantity of water, adding to it a little vinegar or lemon juice, will be very beneficial, whether used as a gargle, or by dipping soft linen rags into it, and gently applying them to the part affected. 'Tis a wrong custom, which has prevailed among surgeons, to dip a sponge in a mixture of this kind and rub it roughly against the part; for this is constantly prejudicial, both as it increases the pain, and destroys the



the tender parts. But in case the disease begins to spread, and the parts grow fetid, these remedies will prove insufficient, and we must endeavour to subdue the putrefaction with sea salt. Twenty drops of this spirit, mixed with half an ounce of honey of roses, gently rubbed over the part affected several times in a day, will answer very well, and if the putrefaction be very great, encrease the quantity of spirit of sea salt: the spirit of sea salt even alone, without any other mixture, may be applied with good success when the case is very bad; for it will presently stop the progress of the gangrene, and the gangrenous eschar will be separated from the living parts. I have never known this application to fail me, except where the gums being entirely putrified, the jaw bone has been affected, for then I could not prevent its becoming carious; but it will certainly answer our intentions, in radically removing the gangrene of the soft parts in the inside of the mouth.



When this disorder affects the lips, we have still something more to fear: for when the integument is eroded, which covers the soft substance of the lips, the nervous papillæ are oft expanded to an immense bulk, when freed from this confinement, and degenerate into a very bad fungous cancer. Or if the membrane, which lines the inside of the nostrils, be corrupted, the bones will be laid bare, and as they are very tender, they will not admit of an exfoliation, but constantly grow carious and fall off. If a gangrene, therefore, seizes on these parts, it must be evidently very difficult to cure.

It is scarce ever known that a spontaneous gangrene, happening in the toe of aged persons, admitted of a cure.

A gangrene is produced in dropical people, either because the water that is collected by pressing upon the parts extinguishes all motion in them, or because when it is grown putrid or sharp, it erodes the parts that are contiguous; in both



both which cases there are little grounds for hope : for if the waters remain, the disorder will be increased, as the same causes which produced the gangrene will still continue to act. And if by any means they are drawn off, the parts being grown flaccid, and well nigh tabid, and no longer sustained by the uniform pressure of the fluid, wherein they were steeped, will run together, the vessels will burst, and the death of the part affected, and of the whole corporeal system, will be accelerated.

In consumptive people also, who already labour under an atrophy, from a purulent state of the blood, and which commonly ends in a very putrid diarrhæa that carries them off; 'tis very plain there can be no hope of recovery, if once a gangrene seizes upon any part of the body ; for the vital strength is continually decreasing, and the nature of all the humours daily growing more acrimonious, so that neither the separation of what is corrupted, nor the restoration of



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what is left can here possibly be obtained.

It is one of the worst symptoms in a gangrene or sphacelus that has seized upon the extreme parts of the body, to have any signs of a disordered brain.

In all diseases, in which the circulatory motion of the blood is increased, a dryness arises from the exhalation of the thinnest juices; and on the other hand, in languid or chronical diseases, the body becomes turgid and swelled with accumulated humours, from the too great slowness and weakness of the circulation.

Scarifications of the gangrenous parts form, as it were, outlets, by which the corrupted humours may be expelled from within, and a passage given to those remedies which correct the present putrefaction, and prevent the future.

Cupping glasses have also a very good effect when applied to the living parts, which are near to the gangrenous, in order to increase the quantity and impetus of the vital humours flowing thither;



ther; and thus also the fibres, which connect the gangrenous with the sound parts, are at the same time dissolved, so as to procure a separation of them.

Daily experience evinces that the flesh of animals may be as well preserved from putrefaction by vinegar as by salt. In the mean time vinegar has this good quality over salt, that it does not so much harden the fibres or vessels, nor coagulate the juices, but rather dissolves or attenuates the blood.

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## Of Burns.

THE heat of the human body seldom exceeds the ninety-sixth degree of *Fahrenbeit's* thermometer, even in the strongest men; but when the heat of the body ascends above the hundredth degree in diseases, the blood and its serum then begin to be disposed to coagulation; but if the degree of heat in the body is equal to the hundred and twentieth de-



gree of the thermometer, the serum of the blood coagulates. Heat therefore raised to so great a degree changes the disposition of our juices, though the solid parts do not as yet seem to be much injured by it. But when the heat is raised equal to that of boiling water, which is usually about two hundred and twelve degrees, then the solid parts are injured, many of them being dissolved.

Water applied to a fierce fire, hardly heats beyond the two hundred and fourteenth degree, and when once the water has acquired this degree of heat, it cannot be heated to any greater degree, however much the fire be encreased beneath the water. But oil olive, and linseed oil, or the like oils expressed from seeds or fruits, cause the mercury to ascend in the thermometer to the six hundredth degree when they boil; whence we observe a great difference in the effects produced when any part is burned, by the application of boiling water or scalding oil.—And boiling pitch is still more dan-



dangerous than oil, because by its tenacity it very firmly adheres to the skin, whereas oil much sooner runs off.

It is a constant observation that when boiling water falls upon any part, it generally excites a gangrene in the place where it first touched; whereas the rest of the parts are less burnt over which the water passes successively after the former.

If any part of the body be burnt by actual fire, by gunpowder, boiling oil, or any other violent cause, the eschar will be so thick and hard, as very often to require deep scarifications, in order to set them at liberty from the adjacent sound or living parts: only the most emollient ointments can be in that case serviceable, with cataplasms and fomentations of the like nature; and all desiccative or astringent applications will be prejudicial. Even spirits of wine, which is much recommended by *Sydenham* and others for the cure of all burns, will, in this case, not only harden the  
eschars,



eschars, but also retard the cure, and frequently augment all the bad symptoms.

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*Of a Scirrhus and Cancer.*

ALL scirrhi are attended with hardness, without pain, and, according to *Galen*, even the worst and most incurable species of them are insensible.

A scirrhus may often arise after inflammatory diseases in parts which are not glandular, when by frequent bleedings, the vital powers are so much weakened, that the impulse of the vital humours is not sufficient to remove the obstructing particles impacted into the narrow extremities of the converging vessels, nor yet is it able to separate them by a mild suppuration. Hence perhaps it is that we so often find the lungs adhering to the pleura, and in part rendered scirrhus after a pleurisy; for the membranous parts have been observed to degenerate surprisingly in this manner,  
after



after violent inflammations in them not well cured.

A scirrhus arises from no cause more frequently than from venereal buboes tending to suppuration, and opened before they are brought to maturation: or else from a too sudden healing up of the ulcer left after such a bubo.

A scirrhus may remain a long time in several parts of the body without injury, unless the adjacent vessels be much compressed by it; but if once the old scirrhous matter, either naturally, or by an imprudent management, be put into motion, it soon degenerates into a horrid cancer.

Out of twenty women afflicted with cancers, fifteen of them are troubled with the disorder betwixt the forty-fifth and fiftieth year of their age, or if in younger personages, their usual menstrual discharges were certainly suppressed.

In order to move the voluntary muscles, a free commerce is necessary thro' the nerves betwixt the brain and muscles;



cles; if, therefore, the nerve which leads to a muscle is compressed in any part of its course from the brain by a scirrhus tumour, that muscle will become paralytic. If now a large trunk of nerves leading to some particular part of the body is compressed by such a cause, a perfect palsy will follow in that member.

If we consider the nature of a scirrhus, it will be sufficiently evident that many bad consequences may arise from it, if the humours are excited into motion thro' the circumjacent vessels, from whatever cause that increased motion may be produced; for in a scirrhus the congealed or inspissated matter is collected either in the cells, or in the complicated vascular fabrick of the gland, which may be therefore looked upon as a dead part: but the vessels filled with this impervious matter, or the follicles distended with the same, have other sound or living vessels dispersed through their membranes, which vessels being compressed or obstructed by the concreted or scirrhus matter,



matter, will render the passage of the humours through them more difficult; for though the humours were able to pass through them with a gentle motion, yet when the celerity of the circulation is increased, as, for instance, by a fever, those vessels compressed on all sides by the scirrhus cannot be dilated, though at the same time there is a greater quantity of juices to pass through them: hence follows an obstruction, and from the force of the increased motion of the humours an inflammation. For as a considerable heat must follow, from the violent attrition in the compressed vessels, a putrefaction will of consequence soon follow in the concreted matter of the scirrhus, with all those disorders which are the consequences of a cancer.

While a scirrhus is lodged in a part of the body, there must be extreme danger of its degenerating into a worse disorder, since all those causes, which are sufficient to change an indolent scirrhus into a malignant cancer, cannot be avoided by any art or prudence.

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The scirrhus part may be exposed, in persons of a good habit of body, to the vapours of warm water twice a day, and then to use gentle frictions, applying afterwards an aromatic plaister, more especially compounded of the ferulaceous gums, and those of galbanum, sagapenum, ammoniacum, &c. Fomentations and cataplasms formed of the same ingredients may be also used for the same intentions; by this method continued for several months, I with pleasure recollect several recent scirrhi of the breasts happily cured. I have likewise seen much service from a solution of *sapo Veneti* in milk, which being reduced to the consistence of a thin poultice, and laid on a sponge, was applied to the scirrhus part, and secured by applying over it a hog's bladder oiled.

*Galen* very justly observes, that a scirrhus becomes softer by the use of relaxing medicines, but does not decrease, whereas they are considerably diminished in bulk, by the application of such remedies



medies as have vinegar in their composition; and he therefore recommends the alternate use of both.

There is, perhaps, no better internal medicine, or any of greater efficacy in the cure of scirrhi than vinegar, saturated with pure alkaline salt; or, if to a pint of Rhenish wine be added half an ounce of the *sal card. benedict.* or of bean stalks, &c. taking half an ounce of this mixture two or three times a day.

Mercury is often found serviceable for resolving scirrhus tumours, as well by external, as by internal application; but then it must only be in a benign and incipient scirrhus; for when the concreted matter is compacted almost into a stony hardness, and the scirrhus begins to be malignant, no relief can be expected from the use of the strongest mercurial preparations, nor even from a mercurial salivation itself; but rather that all things will be rendered worse, and the motion of the humours being increased by these remedies, a scirrhus will



will be the sooner changed into a cancer by these means.

Large scirrhi very rarely continue long in the breasts in an irrefolveable state, before they infect the subaxillary glands in the same manner.

The scirrhus should never be pulled imprudently while it is separating; for the tension by that means made upon the nerves, will not only excite the most severe pain, but it may sometimes even produce fatal convulsions even a considerable time after the operation has been performed. Equal care ought also to be taken not to irritate the surface of the crude wound with acrid stypticks or the like, which powerfully coagulate the blood; for the grumes of concremented blood lodged in the divided veins, may pass inward through those diverging vessels to the heart and lungs, where they may give rise to a polypus. But scraped lint pressed upon the part with a suitable bandage, will be generally sufficient to answer that intention; the puff-ball,  
4 fungus,



fungus, bovista, or puff-ball, is likewise of good use to suppress the bleeding. The impossibility of resolving a scirrhus may be known from its age, the colour of the integuments being changed into a red, purple, or livid, together with its stony hardness, and the roughness or inequality of the surface of the tumour. But when to all these an itching is also joined, there is much greater danger that the scirrhus may, in a short time, be converted into a cancer; for then the concreted parts of the scirrhus begin to be put in motion, and gently distended by the nerves dispersed through its substance, from whence an agreeable titillation follows, and at length a troublesome itching.—If a pain ensues soon upon this itching, the danger is still the greater. When mercurials are applied to a scirrhus, care should be taken to avoid a salivation, which might be unexpectedly raised, and would always be prejudicial in this case, since the motion of the humours would be increased by

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that means, without a possibility of resolving the scirrhus concretion; and the acrimony of the humours being thereby farther increased, a scirrhus would consequently quickly degenerate into a cancer. Pain is the distinguishing sign of a cancer.

So long as the integuments of a cancer are not yet eroded, but that it remains as yet confined in its proper integuments, it is said to be an occult cancer; but when it is in such a state of malignity as to corrode the integuments, and discharge a sanies or foul matter, it is then termed an open or ulcerated cancer.

Of all pains that is the worst which feels to the patient like actual fire burning within the scirrhus; for then the integuments of the occult cancer are gradually distended by the increasing of its bulk, and eroded by its greater acrimony.

*Galen* very justly observes, that putrefaction arises from two causes; either



ther from a weakness of the concoctive faculty, which is not capable of performing a better change in the humours, during their state of putrescence, or else from the great malignity of the humours, which cannot be conquered by the concoctive faculty, however strong it may be. Now both these causes concur in a cancer; for the efficacy of the vital blood and humours, upon which *Galen's* concoctive faculty depends, is here little or nothing, or at most but very weak, whereas the malignity of the matter to be overcome by this weak faculty is very great. They therefore delude the unfortunate patient with false hopes, who assert that the matter of a cancer may be brought to resolution and suppuration, and reduced into pus by boasted *arcana*.

Cancers of the uterus, especially when they are ulcerated, are incurable.



*Of the Diseases of the Bones.*

**H**AVERS says, that in an *os femoris* he had seen the *fides* in the middle of the bone, before any of the *lamellæ* were parted off, five times thicker than in the head of the same bone. But in a like *os femoris*, which I have by me curiously prepared, the *fides* in the middle are at least twenty times thicker than the thin boney covering, with which the head of the bone, the bigger *trochanter*, and the lower part of it that is articulated with the *tibia*, are invested. Hence it is evident, why the parts of the bone, which lie near the joints, are most frequently subject to the like diseases with the softer parts: and for the same reason much worse consequences are apprehended in fractures, if they happen in the broader part of the bone nearer the joints, on account of the many vessels that are injured, and the effusion and corruption of the liquids.

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The medullary oil contained in the vesicles, which are found in the cellular part of the bones, seems to have a two-fold use, viz. to lubricate the joints, and to diffuse itself between the lamellæ, in order to prevent the bones from becoming too dry. For which reason, if either thro' diseases, or old age, this oil should chance to fail, the joints are moved with difficulty and grow apt to crackle; and the bones, being no longer lubricated by it, become more liable to be broken by every slight injury.

The use of the internal periosteum of the bones seems to be, not only to convey the arterial vessels into the medullary vesicles, and receive the veins returning thence, but also to supply the bone itself with life and nourishment, by the vessels which it transmits into the substance of the bone, and likewise receives from thence. And does not this seem conformable to some surprising observations which have occurred in diseases of the bones? *Ruyseh* has given the description



and figure of a curious bone in the arm, which contained within its cavity a boney pipe, so intirely separated from the external substance of the bone, as to be capable of being moved any way. In this case it seems not at all improbable that the internal part of the bone, which more immediately receives benefit from the internal periosteum, was affected with some disorder, that had its first rise in the internal periosteum, and that from thence the internal hollow part of the bone seceded from the external part that was left behind.

*Du Verney* has proved that there are nerves in the marrow. He plainly discovered a nerve passing to the marrow with an artery and a vein through the substance of the bone, and observed that these three vessels are all included in one common sheath, which is a production of the periosteum. Besides, he has demonstrated by manifest experiments, that the marrow is sensible of pain. For in the hospitals, upon reviewing the dressings



sings after the amputation of a limb, he frequently ordered his assistants to press something against the marrow as it lay exposed, and the patient always expressed a strong sense of pain. And to leave no room for doubt concerning this, he cut off the leg of a living animal before the members of the Royal Academy of *Paris*, and after waiting a while, till the cruel pain which attended the operation was over, he thrust a probe into the marrow, and immediately the animal expressed a sense of the most exquisite pain. This experiment he tried frequently, and with repeated success. Whatever impedes the motion of the medullary oil, will cause its stagnation. All oleaginous substances, however mild, are spontaneously disposed to become exceedingly acrimonious, some sooner, others later. The oil of sweet almonds, which is so extremely mild when fresh drawn, will in the summer time turn so acrid within a few days, as to feel hot in the mouth while it is swallowed down. Butter



likewise is apt to turn in the same manner, though not altogether so speedily. A caries is the worst malady to which the bones are subject, and indicates an almost total corruption or erosion of them; flighter disorders of the bones are usually cured by exfoliation, the corrupted lamellæ separating from each other: a caries never can, but must be removed by incision or caustick, till you come to the sound parts.

There is no question but that the marrow may be injured by violent contusions and fractures of the bones. But when, without any external injury, the medullary oil becomes corrupted from an inward cause, then the disease is generally termed a *spina ventosa*; which disease was first described by the famous *Arabian* physician *Rhazes*, and so named, because it consisted in a corrosion and corruption of the bone, and attended with acute pain and swelling.—But when a corruption of the bone, beginning externally, spreads inwards, even tho' it should infect the marrow, we shall still



still call it a caries of the bone. This corruption of the bone, which owes its rise to the medullary substance being first affected, is no where to be found in any of the ancient *Greek* writers. It is greatly to be lamented, that this disorder is frequently neglected so long, that the bone is entirely corrupted, and the tumour begins to appear in the flesh and muscles: for which reason great care should be taken to endeavour at a discovery as much as possible, in the first beginning. 'Tis plain, indeed, that this must be extremely difficult, if we consider how deep this disease lies within the bones. The following observations, however, may assist us greatly in the investigation of it. If the patient is known to labour under such an ill habit, as by experience we find is most frequently apt to affect the bones; such, for instance, as the venereal disease, the scurvy, and the rickets in younger persons, which last distemper often gives room to suspect a latent venereal taint; from



from these particulars we may know, that the causes which predispose to this distemper, do actually subsist in the body. But we have scarce any other distinguishing sign of the presence of the disease, except that of an obstinate, excessive pain, which lies very deep, and as the patients usually express it, is fixed in the bone, attended with a *gnawing pain*. This pain is farther increased by the warmth of the bed, by violent exercise, or the free use of wine or cordials; and yet though the part affected be pressed or rubbed ever so hard, no increase of pain shall follow upon it; and we may the less wonder at it, because the bone intervenes, and by its hardness prevents any external application from acting upon the place affected. These are the signs of the disease in its first stages; but when the bone once comes to be eroded, and the external periosteum to be affected, the pain increases, and grows much more intense upon the least roughness used outwardly to the part; and then



When there arises a soft tumour in the muscular flesh; though generally before this the very substance of the bone shall rise and swell, in which case the disease is easily to be distinguished, though too late, because the whole substance of the bone being corrupted, will either spontaneously fall off from the parts wherein there is life, or must be taken away by incision or caustick.

The mildest of all the diseases to which the bones are subject, are those which begin in the external periosteum. Exostoses arising from external injuries are seldom cured, unless they are capable of being removed by manual operation.—Those arising from internal causes are often cured by a removal of the cause, or at least are very much decreased in bulk.

An ancylosis is always difficult of cure. If it arises from the callus of a bone broke near the joint, and has already acquired the hardness of bone, it is then incurable; as also if it proceeds from an  
exostosis



or concretion of the articulated bones. But if it owes its original to an inspissation of the liniment of *Havers*, or the stiffness of the ligaments, there is reason to hope that it may be cured.

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*Of Internal DISEASES, and of FEVERS  
in general.*

**W**E may almost venture to affirm, that no person can live without a fever, and that few have died without one.

The greatest caution is necessary in searching out the very hidden nature of a fever. In this case we are not to assume any thing from hypotheses, previously contrived, however ingenious they may seem; but we are only to consider the appearances of the fever present in the body, and to weigh each of them apart, that by afterwards comparing them together, we may by just reasoning be led from them to understand the proximate cause



cause of a fever. Whilst the most acute philosophers indulge their speculations in searching after the causes of natural things, they often entertain us with splendid theories, and wonderful productions of mere imagination, yet without doing any great mischief; but when this method is taken to discover the nature of diseases, the curative part may be founded upon a false hypothesis, which would be turning a matter of the greatest importance, and of the most serious consideration, into joke and pastime; namely, what relates to the life and health of ourselves, and the rest of mankind.

There are three symptoms only observed which are common to all fevers, namely, a *shivering*, a *quick pulse*, and *beat*. A shivering is meant by physicians to signify that shaking of the whole body, which arises from a sense of cold, as when a person being warm suddenly exposes himself to the cold air. This sense of cold is always observed to attend in every fever arising from internal causes.

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To denominate a fever acute, it is necessary that its swift course be joined with danger; but in order to denominate a fever slow, the small advance which it makes is sufficient, whether life be in danger or not. For a quartan hardly ever proves fatal, unless by some error in the patient or physician, and ought therefore to be ranked among diseases of a long continuance, as well as a hectic fever, from whence very few escape. *Celsus* therefore very properly defines diseases of long continuance to be those *sub quibus neque sanitas in propinquo neque exitium est*. "In which neither health nor death are near at hand."

Since epidemical fevers arise from some common cause, they have usually almost the same course and symptoms, and require the same method of cure in all: but particular fevers, arising from very different, and often opposite causes, require to be treated in a different manner in different people.—Even *Hippocrates*  
has



has taken notice of this distinction in fevers: but we much more frequently meet with acute fevers epidemical, and slow fevers more rarely, among which last quartans are the chief.

We may by constant observation discover in every fever, that the velocity of the pulse is increased, and that therefore the heart contracts more frequently or swiftly; and thence again, that those causes from whence the contraction of the heart results, are increased. But in what manner the causes act, which excite the heart to a quicker contraction, and after what manner, for example, an intermitting tertian is renewed every other day, when it afforded no action or appearances at all on the intermediate day, these are hitherto concealed from all of us; for all that we know of the nature of a fever, we discover only by its inseparable effects and appearances; nor can human understanding proceed farther in her investigation.

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Since the dilatation of the artery is synchronous with the contraction of the heart, the pulse cannot be accelerated unless the contraction of the heart becomes quicker at the same time, as that is the only and entire cause of the dilatation of the arteries. For all that has been said by some authors concerning ebullition, fermentation, of effervescence of the blood, &c. in the cavities of the heart, has been proved to be false, and contrary to experiment; and it appears most evident, that the cause propelling the blood from the heart into the arteries, does not reside in the blood itself, but in the heart, which immediately receives the blood. A fever may be therefore deservedly called a disease in the heart, since in every fever the action of that muscular organ is changed, namely, by being brought into more frequent or quicker contractions.

It appears from the principles of anatomy and physiology, that the muscular motion of the heart renders its own  
muscular



muscular fibres paralytic ; and that by this means the whole heart is so disposed, that a new contraction must follow the moment after ; for the nerves sent to the heart are so situated, that they must be compressed by the dilatation of the largest arteries distended by the blood expelled from the heart, the aorta and pulmonary artery, during the dilatation of which the venous sinusses and auricles of the heart are likewise distended ; and therefore the influx of the spirits through the nerves into the muscular fibres of the heart, is thus impeded, while at the same time all the blood is expressed thro' the vessels dispersed through the substance of the heart ; which therefore looks pale, during its systole. Thus are the two causes, absolutely required to muscular motion, intercepted or removed ; namely, the influx of spirits and arterial blood. But in that moment of time, while the heart, as it were paralytic, has its cavities filled by the influent venal blood, the aorta is

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contracted, and with great force urges the blood through the orifices of the coronary arteries throughout the whole substance of the heart, and at the same time the nerves are no longer compressed, as the arteries are then contracted, and the sinusses and auricles emptied, whence they freely transmit the spirits sent from the cerebellum through the cardiac nerves to the heart; and therefore the two causes of muscular motion will be renewed, and thence the contraction of the heart will be instantly repeated.

A quartan is usually accompanied, in the beginning of a fit, with a violent and long-continued coldness; but in the beginning of a fever of one day's continuance, there is often only a very slight sense of coldness perceived.

There very often is so great a weakness observed in the pulse, during the cold fit of a fever, that the stroke of the artery is hardly perceptible to the touch, and this more especially in old people afflicted with the quartan fever in the winter



winter time ; and then also the quickness of the pulse is so great, that it seems rather to tremble, than to be made up of a distinct dilatation and contraction. But where there is so great a celerity of the pulse, as to be ten times quicker than what is natural, nobody can distinguish its numbers ; but there is only a surprising undulatory motion perceived by the finger ; and if the hand be applied to the breast, the heart seems to tremble, instead of beating powerfully against the ribs, as is usual in health : and in this case, sometimes the artery will dilate more powerfully, and then again appear extremely weak and quick ; and sometimes a true intermission of the pulse may be discerned in this case ; and then the patient often complains in such a fever, that his eyes are dim, or that he cannot hear, or scarcely feel. In this case the same thing happens as before death in the dissection of living animals ; for we then see that the

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heart, being no longer able to expel its contained blood at each systole, trembles and evacuates only a part, not being able to dilate the arteries: in the mean time the auricles and venous sinusses are greatly distended; and after a few moments become suddenly contracted, forcibly projecting their blood into the ventricles of the heart, which being then irritated by the quantity and impetus of the influent venal blood, is very powerfully contracted; then again it trembles and languishes until it be excited by the same cause, or till all motion ceases by the death of the animal. For the greatest anxiety, most difficult respiration, and even the struggles of life with death, seem frequently to attend at this time of the fever. Hence *Galen* justly pronounces, *In quartanarum principiis videbitur tibi arteria quodammodo esse alligata, atque ad interiora retracta, & prohiberi, ne insurgat.* "That in the beginning of quartans, the artery will seem,  
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in a manner, tied up, and drawn inward so as to prevent it from dilating. From what has been said, it is easy to explain another passage in *Galen*, where he places the most certain sign of an incipient quartan, in a slowness and smallness of the pulse; for in the height of the cold fit, the artery is often agitated with a tremulous and obscure motion; and then after a few moments one shall be able to perceive a single and violent stroke or dilatation of the artery, which will then cease and return again soon after: so that if one numbers those violent pulsations, the artery will seem to beat slow, when at the same time, during the supposed intervals, it is extremely quick and weak in its motion. Add to this, that sometimes for a few moments the motion of the artery entirely ceases, and a true syncope takes place. Hence it appears in how great danger the patient is at that time, and why death sometimes happens in the cold fit.



The lively colour observed in a healthy person arises from the vessels filled with red blood; so that when the force of the heart begins to be weakened from any cause, not being able to propel the blood to the extremities of the body, and the arteries at that time contracting by their own elasticity, especially towards their extremities, which are the least urged by the force of the heart, the blood is by that means repelled from the smaller into the larger branches; therefore the subcutaneous arteries, which are some of the smallest in the body, will be in a great measure emptied, whence a paleness will arise.

It is evident that the parts are more flexible, in proportion to the greater abundance of humours, with respect to the solid parts; but in the beginning of a fever, the force of the heart being weakened, cannot fill the smallest vessels in the extreme part of the body; and therefore these being contracted, and repelling back their contained juices into the



the larger vessels, this will be one cause of the rigor or stiffness in the beginning of fevers. Besides this, the cold which contracts every thing, will increase the cohesion of the solid parts, and consequently augment their stiffness: the truth of this every one has experienced, whose hands have been much exposed to the cold in winter time; in consequence of which the fingers have been so stiff, as to be scarce able to take hold of any thing. Since therefore these two causes concur, it is no wonder that a very great stiffness arises in the time of the cold fit in fevers.

In intermitting fevers, if the patient is not very weak, or advanced in years, the hot fit is usually so much the more intense, as the preceding cold was more violent.

It is one of the best signs if the febrile heat is equally diffused throughout the whole body, even to the extremities; for it denotes that the vessels are pervious, and that the blood has a free circulation;



but in the worst fevers, which are then commonly fatal, there sometimes happens an intense heat perceived about the vital organs, while, at the same time, the extreme parts of the body are cold; and it then denotes that the circulation is deficient in the extreme parts of the body, and that the impervious blood begins to stagnate or accumulate about the vital viscera; while, in the mean time, the heart being more swiftly contracted, propels the blood with a great velocity through the vessels, which are yet pervious in the parts next adjacent.

It is a very dangerous disorder when the stomach is extremely distended by too great a quantity of aliments rarefied by heat and stagnation; for then both orifices of the stomach have been observed to contract themselves violently with a convulsive force; whence has followed intolerable anxiety, fruitless endeavours to vomit, and lastly, a fatal apoplexy, while the trunk of the descending aorta being pressed by the distended stomach,



stomach, urges blood too forcibly, and in too great a quantity upon the encephalon; so that the vessels being extremely turgid, are sometimes burst.

When in ardent fevers the blood, by an inflammatory tenacity, stagnates impervious in the smallest arteries, these last being distended, compress the adjacent secretory and excretory small ducts; and hence the whole external skin, tongue, internal parts of the mouth, fauces, &c. are invaded with a burning heat; and when the patient recovers from these most dangerous diseases, almost the first symptom of nature's overcoming the disease, is a return of moisture into all these parts.

It is a general indication in every fever, so to moderate the force of it, that it may not, by destroying the solids, and thickening the fluids, produce inflammations, suppurations, gangrenes, &c. nor yet to let it subside so low as to be incapable of attenuating, changing, moving, and expelling the morbid matter. Nor is it



possible sufficiently to inculcate this general and practical rule, which is of the greatest moment; because many have too ill an opinion of the name of *fever*, and believe that it ought ever to be engaged with the most forcible methods; when at the same time it appears from the writings of the ancients, and observations of the best physicians, that a fever often most happily cures itself, provided it be kept under a due regulation or moderate degree.

A fever may terminate in health two ways; as when the morbid matter is so changed by the force of the fever itself, that being assimilated with the healthy humours, it may be freely carried through the vessels, without any disturbance to the equable circulation; or else, the same morbid matter being subdued, and rendered pervious by the force of the fever, is afterwards expelled out of the body, and this either by an insensible or a sensible evacuation.

*Sweats, vomiting, and diarrhœa,* are evacuations only serviceable, inasmuch  
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as they expel the febrile matter, either wholly or in part from the body; whereby the disease may be entirely removed, or at least alleviated. The principal sign whereby the usefulness of these evacuations is known, is derived from their effects. But there is great reason to hope that a vomiting, sweat, or diarrhœa, will be useful, if they happen after the concoction or height of the disease, when nature has got the better of the disease; for those which happen in the increase of the disease, are rather symptomatical than critical evacuations, and often do more hurt than service.

There are two principles upon which the diagnosis of diseases are founded; the first depends on a knowledge of the preceding causes, which are such as appear to have produced the same disease before, and the second is a knowledge of the disease in its own nature and present effects.

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We should always remember the admonition of *Hippocrates*, *That a much more dangerous error may be committed in defect than in excess.*

Old people bear abstinence the most easily; and this is indeed true while they are in health, because they are nourished neither for encrease nor strength, but only to support their being; and in these the cavities of a great number of vessels are either entirely closed up or very much lessened; whence a less quantity is required of humours to flow through them; add to this, that all the vessels being now more rigid, yield less to the impelled liquids; and many of the humours being expelled from the body in fevers, will occasion dryness from this diminution in the quantity of liquids: *Quia naturæ progressum qui est ad siccitatem, effugere non licet, ideo senescimus & corrumpimur:* “As we cannot avoid the course of nature, which tends to dryness, we therefore grow old, decay, and die;” and therefore the disorders



disorders happening in old age will be encreased by a fever, if the patient is not relieved by a soft and moistening diet. But here more especially the food must be given often, and in small quantities, because the vital strength which is weak in old people, would be destroyed by greater quantities; and they require but small supplies, provided they are given continually; add to this, that abstinence or fasting in great old age, often brings on a fatal syncope; because the quantity of humours being lessened, the rigid vessels do not contract themselves in proportion; whence there will be no action of the vessels upon their contained fluids; and thus one of the causes of their circulation through the vessels will cease, whence a stagnation and death; for the heart, by expelling the blood from its cavities, dilates the arteries, but the very next moment the arteries contracting ought to promote the impulse of the blood to continue the circulation; and to do this it is necessary for the sides of  
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the arteries to remain contiguous to their contained humours; but the vessels, now rendered extremely rigid in old age, and the quantity of the humours being also dissipated by the fever, it is evident that this effect cannot easily follow. And thus the reason is evident, why abstinence is so prejudicial to old people in fevers.

In consumptive people, whose lungs waste away by a slow suppuration, there is a continual slight fever, which often encreases every day at the time when fresh chyle is plentifully supplied, and driven together with the blood through the lungs; some people therefore, believing this fever to be of the intermitting kind, have made trials of the virtues of the bark, but always with the most fatal success; for the purulent cause remaining, the febrile motion must necessarily be suppressed, whereby the collected matter ought to have been expelled; whence the greatest anxieties, and sometimes death itself has followed from that practice. For the whole cure of such a

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disorder



disorder consists in washing out, as it were, and detarging the purulent matter; and then to consolidate the parts thus cleansed from the matter, as in the cure of a clean wound.

The sanguiferous veins being more lax may be always more easily distended than the arteries; but when these veins are filled with an encreased quantity of blood, the arteries will meet with more difficulty of discharging their blood into them; whence the arteries themselves will become more distended. But since, in most parts of the body, the arteries and veins accompany each other, therefore the distended arteries will press upon the less resisting veins, and by that means propel the blood through them towards the right ventricle of the heart; from whence again it will soon be propelled into the distended arteries. Hence it is evident, that at length almost all the blood will be accumulated in the arteries of those who are highly plethorick. But when the contraction of the heart urges  
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the blood into the now very full arteries, the serous and lymphatic arteries, which arise from the sanguiferous, will be so far dilated, as to admit the red blood, as appears evidently in the tunica adnata of the eye, and in the whole skin, which is often very red in plethoric people; and thence these vessels also being dilated, will compress the smaller adjacent arteriolæ; but when this is also accompanied with a fever, the heat thence arising rarifies the blood, and therefore all those evils will be consequently increased: thus we sometimes see the whole body suffused with redness, while at the same time the roughness and dryness of the skin, tongue, fauces, and internal part of the mouth, plainly prove that the smaller vessels are impervious, being compressed by a true *σπλῆξις* or strangulation, from the larger vessels being over-turgid with too much red blood.

The more severe a cold fit is, in the beginning of a fever, so much the more dangerous it is; for this coldness denotes  
a dimi-



diminution of the circulation, and therefore the greater the coldness, the less the circulation, and the less the circulation, the nearer the disease approaches unto death, wherein the circulation wholly ceases; but if at length the vital powers overcome this coldness, being irritated by the same cause which produced the fever, they render the circulatory motion so violent or swift, and excite so strong a heat, that the worst consequences of every kind may be feared: for the very tender vessels of the encephalon and lungs cannot bear so great a force, without the greatest danger; and the great heat following after the most intense cold may dissipate the more fluid parts of the humours, and inspissate the rest; whence there is the greatest danger, lest the humours becoming impervious, should adhere to the narrow extremities of the arteries, whence the worst inflammation and gangrenes might be justly feared from so violent an impulse of the humours urging from behind obstructions in such a fever.

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The reason why a severe tremor is bad in fevers, is because it denotes that both the nervous and arterial fluid are either deficient or impervious; and at the same time such a violent trembling arising much in the beginning of a fever, denotes much strength of the efficient cause which is capable of exciting so great a disturbance, in a body which has been hitherto healthy; and likewise because a great trembling supposes obstruction opposing the circulation of the humours, therefore many bad consequences are justly to be feared from thence. Moreover, tremblings which arise in the course of acute fevers or other diseases, unless they proceed or accompany critical evacuations, are often of the very worst import, because they generally denote, that the matter of the disease inclines to the head, and there disturbs the equable motion of the nervous fluid in the origin itself of all the nerves, that is in the medullary substance of the encephalon.

Anxiety



Anxiety arising in an acute disease always deserves the strictest attention, since it is often attended with so many bad consequences. Physicians often repeat too late the errors committed in this respect, when for want of caution, and through hurry of business, they have neglected the complaints from this symptom. A diligent enquiry ought therefore to be always made, after the cause of anxiety, and the part of the body wherein it is seated; for the greatest danger attends anxiety, arising from the course of the blood impeded through the pulmonary arteries: but that is less dangerous which proceeds from an obstructed passage of the blood through the *vena portarum*, though even thence the worst consequences may follow: but that kind of anxiety is of all the least dangerous which arises from flatulencies and a spasmodick contraction of the vessels, thro' an inordinate motion of the spirits, as is often observed in hysterical and hypochondriacal people.



The reason why a spasmodick, or nervous anxiety, is but little dangerous while an inflammatory one is extremely so, is, that because in the first case when the anxiety has so far encreased, as to bring on a fainting, the spasm goes off, while the person faints by the convulsive anguish; because the heart then cannot propel the blood with its due force to the encephalon, and therefore it cannot move the spirits through the nerves; whence the inordinate influx of them into certain parts will cease and relieve the anguish. This is evident by daily observation in hysterical women, when the muscles of the gula being contracted with a cramp, retain the air in the tube of the œsophagus that was before received into it, where expanding by the heat of the parts it occasions a tumour, and compresses all the adjacent parts with a sense as it were of immediate suffocation; for so soon as the women begin to faint, the cramp ceases, and the confined air is discharged by  
ructus



ructus, with a considerable noise; whereupon the whole disorder goes off.

But in an inflammatory anxiety, the impervious blood adhering to the extremities of the arteries, and the blood being driven by the heart against the obstruction, expels the most fluid parts, and condenses the rest; whence the cause of the disorder is increased every moment, and death soon follows, unless the inflammatory obstructing matter can be speedily dissolved, which it often cannot.

Frequent fomenting, washing, and gargling the nostrils, mouth, and fauces with warm watery, subacid, and nitrous liquors is of the greatest moment in the cure of fevers; for then the thirst often proceeds from dryness and imperviousness of the blood; and then there is the greatest danger from such a disposition of the blood to be feared in the vessels of the encephalon and lungs: when therefore the patient contains such warm drinks in his mouth, they cleanse the fauces, moisten these dry parts, and



relax the lungs with a warm vapour; more especially if the vapours of hot water are drawn through the nose: but also at the same time the external branches of the carotid artery distributed through these parts, are thus relaxed, and by that means the impulse and pressure of the blood is turned off from the internal parts of the head; add to this, that the continual moistening of these parts most happily allays the thirst.

The first passages are by the law of nature lined with a mucus from the mouth to the anus, which not only gives a lubricity to the internal surface of these parts, but likewise defends them from being easily injured by the rough bodies swallowed, or acrid substances taken into the stomach. The mucus having served these uses is by degrees deterged, and attenuated, more especially by the saponaceous bile, till at length it is discharged together with the fæces by stool; but when this mucus is more tenacious than usual, or the bile weaker or smaller in quantity, it



it is by degrees accumulated, oppresses the stomach, and excites an irritation; whence proceeds a troublesome nausea, which is often of long continuance. This disorder is very familiar with men of letters, especially those advanced in years; for as these lead too sedentary a life, the abdominal viscera are less agitated by respiration; the bile becomes inactive, and is often so much inspissated, as to be scarcely able to pass out through the narrow neck of the gall bladder wherein it is confined; old people are for this reason, *cæteris paribus*, more subject to this mucus than young people.

There is a wonderful consent betwixt the stomach and encephalon, insomuch, that the one being disturbed easily produces a nausea and vomiting in the other. A putrid alkaline acrimony will arise from a nausea too long continued. Vomits should never be given where there is just reason to suspect an inflammation in the stomach, or any of the adjacent viscera.



Common air entering the human body constitutes the material cause of belching and flatus.

If a plenty of air, or such substances as suddenly produce a great quantity of elastic matter, be confined in the œsophagus, stomach, or intestines, &c. and at the same time this elastic flatus is intercepted by a spasmodick constriction of the fibres, either from some acrid irritation, or a disturbed motion of the spirits, the constriction being so great as to retain the flatus from escaping; in this case the rarefaction will be increased by the heat and motion of the body itself, and more elastic matter of the same nature will be added to the first from the flatulent bodies which produced it; whence the confined membranes will be gradually more and more distended, and the most dreadful maladies will ensue. This distension of the parts being thus gradually encreased, will produce the most intolerable pains, at the same time also the blood vessels dispersed through the  
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the membranes, thus distended, being compressed or straitened, will occasion the most violent inflammation and suppression of all the vital circulation of the humours; whence a sudden gangrene, which so frequently proves mortal in these parts. Moreover, the intestines, a long time distracted by wind, may become paralytic, and then they never afterwards return to their natural contraction, but what is taken into the body will be accumulated as in a dilated bag, and being retained there a long time, will give rise to new disorders. Hence the iliac passion, or intromission of the intestines, when the low part, which is not distended, enters into the dilated part of the intestine immediately above. HIPPOCRATES therefore very justly observes, that iliac passions, griping of the guts, and other obstinate diseases, arise from flatulencies.

There seldom is any danger in cholics or gripes of the abdomen, if unattended with a fever.

When



When we endeavour to remove the causes of flatus, we should ever be mindful if a spasm attends at the same time, that nothing be given which may increase it.

The motion of our fluids through the vessels proceeds from two causes, namely, the heart impelling the blood into the converging arteries, and distending them; and afterwards the reaction of the arteries, whereby they resist dilatation, and contract themselves again at the time when the heart is dilating. But that quantity of the blood which is projected out of the ventricles of the heart into the arteries, would not be sufficient to dilate them, even in the most remote parts of the body, unless the arteries were already full at the time when the blood is impelled into them by the contraction of the heart. When therefore there is so great a loss of the fluids that the sides of the arteries, when they are most contracted, do not come into contact in every point with their contained fluid;



fluid; in that case the blood expelled from the heart would fill the arteries without dilating them, and the moment after, when the heart is dilating, the arteries could not contract, because they were not dilated; and therefore the blood contained in their cavities would stagnate and not be sent forward, till by repeated actions of the heart it had expelled a sufficient quantity of blood to fill them, so as to be dilated by the next systole of the heart. The natural motion, therefore, of the humours through the vessels being thus weakened, there will be a deficiency of the quantity of the blood to be propelled through the vessels of the encephalon, the pressure will be diminished whereby the fluids are urged into and through the secretory vessels in the cortical part of the brain, and consequently there will be a deficiency in the secretion of the spirits, and their equable motion thro' the nerves; whence weakness must necessarily follow. The red parts of the blood, consisting of  
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the largest globules contained in our humours, and moved through the largest vessels of the body, are the best disposed to produce heat by attrition, and to retain the heat longest after it is once raised: for the more dense the matter of which any body is composed, or the greater its bulk, and the more exactly spherical its figure, so much the more is it disposed to retain fire or heat a longer time in itself. But all these properties are observed chiefly in the red particles of the blood, if we compare them with the other constituent parts or elements of our humours. For this reason the vessels full of red blood are placed in those parts of the body where the thinnest fluids pervade the smallest vessels, to supply the deficiency of heat in the latter. Thus we know there is a great number of blood vessels dispersed through the medullary part of the encephalon, encompassing the medulla oblongata, and distributed through the plexus choroides in the ventricles of the brain.

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The principal sign of too great a mass to be moved is a large and quick pulse of the artery, while at the same time the veins are turgid, as if they were inflated; for then we know that all the blood vessels are extremely full: for the pulse of the arteries may be sufficiently large and quick, though in the mean time there is no increased quantity of the liquid to be moved, namely, if the blood, thickened with an inflammatory density, passes with greater difficulty through the extremities of the arteries. —But then the veins are emptied, because they receive less, and almost all the blood is accumulated in the arteries. But on the contrary, in languid diseases, the humours are often accumulated in the veins, which are more easily distended, while in the mean time there is a less quantity of them flowing through the arteries. But when both the arteries and veins are turgid at the same time, we know for certain that the mass of humours to be moved is increased. But  
for



for a greater quantity of humours to flow in the same time through a little number of vessels, the celerity of the moving liquid must of necessity be increased; and therefore in this case there will be a quickness of the pulse.

If the effects of heat be well considered, the reason will evidently appear why it may produce a great many and suddenly fatal diseases: for the integrity of all the vital, natural, and animal functions depends on a free motion of the humours through the vessels. But, by an increased heat, those motions are disturbed or entirely abolished, whether this happens either from a rupture of the smaller vessels, or from the larger vessels distended with impervious matter, and compressing the smaller, &c.

When therefore these injuries happen from too great a heat in those parts of the body upon which life more immediately depends, speedy death ensues; and this most suddenly of all, if the serum of the blood begins to coagulate by the immense  
increase



increase of the heat : for in a little time it will adhere impervious in the smallest vessels of the lungs, and intercept all the passage of the blood from the right to the left ventricle of the heart through the lungs; whence a most acute and fatal peripneumony will arise. The same thing will happen if the fabrick of the cerebellum is either destroyed, or so stuffed up with impervious humours as to hinder the influx of the vital spirits through the nerves from the cerebellum to the heart. Many were of opinion that the intolerable heat of fevers ought to be ascribed to putrefaction as the cause; but I believe it will appear to every one who considers it, that putrefaction is rather the effect of heat in our bodies, and not the cause of it; and even that putrefaction once formed does not excite heat by its own proper force, but only inasmuch as the celerity of the humours through the vessels, and consequently their attrition, are increased.

It has been customary to understand  
by



by the name of præcordia all those parts lodged in that space which may be conceived betwixt the diaphragm and the perpendicular plane erected about the end of the diaphragm upon the loins, dividing the abdomen in two ; and therefore the term præcordia includes the cardia, hypochondria, and epigastrium. A faithful observation in diseases has taught us, that foul humours lodged about the præcordia, (whether from an indigestible matter taken in and corrupted, or from a morbid contagion, or from humours spontaneously separated and not discharged, but stagnating and corrupting there) may disturb all the actions of the brain, and produce deliria, ravings, and other symptoms of the worst consequence. After giving a vomit, by discharging these corrupt humours, we may frequently observe many patients to recover from these deliria: the signs by which we may know in general, that these foul humours are collected about the præcordia, are a *foul tongue, a bitter disagree-*  
6 *able*



*able taste in the mouth, nausea, vomiting, and oppression or anxiety*; and this diagnosis is the more certain, if there be no other signs to lead us to believe there are any other causes from whence a delirium may be expected.

Warm bathing the feet, with the application of blisters to them, and to the hams, with friction upon the same parts, are here useful; all these derive the impetus and quantity of the blood towards the lower parts of the body, and consequently divert it from the head, or encephalon. For the blood propelled from the heart by the aorta ascends partly upward, and partly downward by the descending trunk of the aorta; if therefore the vessels of the lower parts are relaxed, the resistance to the blood flowing into those vessels will be lessened; whence it is evident a greater quantity of blood must flow towards the lower parts, by which means a true revulsion will be made from the encephalon. But for this purpose a

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vapour



vapour bath is principally of use, because it more powerfully relaxes and softens, while at the same time there is no danger of compressing the vessels by the weight of the fluid into which the parts are immersed. For it appears from hydrostaticks, that fluids press upon bodies immersed into them, and that this pressure increases in proportion to the height of the incumbent fluid. If therefore the feet are immersed to a small height in warm water, while at the same time care is taken to let the vapours of the water come into contact on all sides with the lower parts of the body, this intention will be fairly answered; and at the same time, likewise, the erect posture of the body will be very serviceable. But the tumour and redness of the parts exposed to such a bath sufficiently prove that the humours are derived, in a greater quantity, towards them. But blisters act inasmuch as by their stimulus they irritate the vessels of the part to which they are applied into more frequent and violent



lent contractions; that is to say, they accelerate the motion of the vital humours through the vessels, which by this means emptying themselves oftener in the same time, they will transmit a greater quantity of fluids; but frictions, by emptying the veins, make way for the blood to pass more easily through the arteries, to empty themselves into the depleted veins; and therefore both the quantity and impetus of the vital humours will be derived towards those parts to which the frictions are applied. But it is very evident that epispasticks, if made of the more acrid substances, and frictions, ought to be applied with such moderation, as only to increase the motion of the humours through the lower parts, without increasing it much thro' the whole body.

By emollient clysters often applied, the fæces are cleared away; the vessels of the intestines relaxed and fomented; the impulse of the humours is consequently diverted from the head, while at the



same time a diluent fluid may by these passages be communicated to the blood to advantage. In a fierce delirium therefore, such a clyster ought to be injected every three hours till the disorder abates; but care is to be taken in the decline of the disease not to weaken the patient's strength too much by the too frequent use of them. Purges in this case may be useful two ways; first, inasmuch as they evacuate the offending humours lodged about the præcordia; secondly, inasmuch as they lessen the too great impetus of the arterial blood, and derive it from the head towards other parts; and at the same time they diminish the too great quantity of the fluids distending the vessels; but in this case those purges are principally recommended which dissolve the humours without exciting any great disturbance in the body.

The bringing down of the hæmorrhoids has always been observed to be useful in diseases of the head; and no wonder, since the hæmorrhoidal vessels  
and



and carotid arteries convey the blood in opposite directions; whence a very great revulsion might be reasonably expected.

For the same reason, likewise, it will be useful to provoke the menses.—But this should be attempted by such remedies as relax and mollify the parts, (and not by emmenagogues, most of which increase the impetus and velocity of the circulation) such as by washing the feet in warm water, epispasticks and frictions; and these may be more especially attempted with hopes of success, when the usual time of this periodical discharge is at hand, or when the pains in the loins, groins, thighs, and tension in the neck, with other signs, denote that the menses are about to flow sooner than usual, as is frequently remarked in acute diseases.

But all these evacuations are only useful when the vessels are distended with too great a quantity of blood, or when the force of the circulation is too violent, and a revulsion of the humours is necessary to be made from the head; for

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when



when in the end of acute diseases a delirium continues, though the disease has almost exhausted the patient's strength, all evacuations are then prejudicial, and an imprudent use of them is frequently attended afterwards with an incurable state of ideotism.—But a weak and small pulse, slight heat, and relaxation of the vessels readily denote that in the present case such evacuations are not to be used.

All causes whatever which too much lessen the quantity of the arterial blood to be impelled to the brain, which impede the free circulation through the vessels of the brain, obstruct the secretion of the spirits, or intercept their free motion through the nerves when secreted, may produce a coma; namely, a coma somnolenta, if all the animal actions are equally lulled by such an impediment; a coma vigil, when the motion of this most subtle fluid is not impeded through the most sensible parts, as it is through many others.

In acute diseases, when a salutary and critical hæmorrhage is about to happen  
from



from the nose, watchings or wakefulness often precede; and this because the blood is carried towards the head more plentifully and with a greater force; and we therefore at that time usually observe *a pain of the head, tension about the neck, redness of the eyes, &c.*

Convulsions subsequent to inflammations of the brain are generally fatal, because they denote that the inflammatory cause is so violent and so deeply seated in the narrow extremities of the vessels of the brain, that the medulla itself is affected.

*In diuturnis lienteriiis ructus acidus obortus, qui prius non aderat, bonum signum.—*

“ Acid belchings, happening in lienterys  
“ of a long standing, says HIPPOCRATES,  
“ which they did not attend before, are  
“ a good sign;” for it denotes that the contractile force of the stomach and intestines is in some measure returned, whereby the ingested aliments may be retained at least so long, as to degenerate into a spontaneous cor-

Q 4      ruption;



ruption, and produce these acid eructations; whereas in a lientery, properly so called, every thing taken in is speedily evacuated, unaltered by stool.

The general cure of fevers requires four things; namely, the preservation of life and health in the patient; a correction or expulsion of the acrid irritating matter; a dissolution and expulsion of the febrile lentor; and lastly, a mitigation of the symptoms.

Those fevers are termed continual and putrid, wherein the humours degenerate much from their natural and healthy state, and at the same time incline to putrefaction; and hence there are various degrees of malignity observed, according to the greater or less intensity or degeneracy of them.

A dryness of the whole skin, nostrils, mouth, and tongue, arises from a dissipation of the most thin and watery juices of the blood by the febrile heat; and partly because the rest of the blood becoming impervious and adhering in the larger vessels, distends them so as to com-



compress the adjacent smaller vessels; and therefore in such patients the skin appears rough and dry, because the subcutaneous vessels distended with impervious blood compress the very subtle exhaling vessels, while at the same time there is a deficiency of the thin serous parts of the blood; the same is also true in the eyes, nose, mouth, and tongue. Hence *Hippocrates* says, that they perish with dryness who die of an ardent fever.

There are three different periods to be considered in respiration, that of inspiration, expiration, and the intermediate space betwixt both; the thickness or rareness of respiration respects the intermediate space of time, but the quickness and slowness belongs properly to inspiration and expiration.—But a large or small respiration denotes a different dilatation of the organs of respiration. The respiration, therefore, which is thick and short, denotes a quickness of the inspiration and expiration, and that there is but a very short space intermediate betwixt those  
contrary



contrary motions. But a laborious respiration denotes difficulty and trouble in the performance of these motions; but since there is so great a burning heat about the vital organs, and the blood is moved with great rapidity through the lungs, being in a manner parched up by the intense heat, it will meet with great difficulty in passing through the narrow extremities of the pulmonary artery; whence the reason is evident, why these unhappy patients breathe so quick, and with so much labour, namely, that they may receive an agreeable coolness from the inspired air, and forward the course of the blood through the lungs. A slight cough may proceed from a turgescence of the blood vessels of the lungs distended too much with impervious blood, so as to compress the air vessels of the lungs, that their surfaces rub against each other, for then such a dry and irritating cough will attend in a peripneumony.

*Galen* observes, that an exquisite ardent fever retains all the signs of an exquisite



quisite tertian, and that it differs only in not invading with a rigor or shivering, and in not coming to perfect intermissions; and that this was the reason why he ranks an ardent fever not among the synochi, or continent, but among the continual remitting fevers. But in the fevers which he calls tertianary (*τριταιορυσες*) or semitertianary; which he likewise refers to an ardent fever; the exacerbations happen always on unequal days. Hence the ardent fever seems also to have something of the nature of an intermittent; and from hence frequently when such fevers are extended to a great length, they afterwards change into intermittents, and even sometimes when intermitting fevers spread epidemically, and appear early in the summer months, they often pass under this appearance. The blood being deprived of its thinnest parts in an ardent fever, tends to concretion, and begins to stagnate in the arteries, whence it is accumulated in those vessels, and distends them,



them, while in the mean time they press out only the more fluid parts of the blood into the veins; whence it appears that by opening a vein frequently in such diseases that part of the blood is removed only which is best disposed to flow thro' the vessels; whereas an hæmorrhage from the nose discharging the blood from the arteries themselves, turns off the impetus and quantity of blood, more especially from the encephalon, whose functions in these diseases are usually so much disturbed.—The best hæmorrhage is that which happens on a critical day, viz. the 4th, 7th, 11th, 14th, 17th, 21st, &c. which are legitimate critical days; but those hæmorrhages which happen on some incidental critical day, as the 3d, 5th, 6th, or 9th, are less salutary; but those happening on other days are altogether to be suspected, and the same will also hold true of the other critical evacuations.

A redness of the face, beset with drops of sweat, is a very bad sign in an  
ardent



ardent fever, because it denotes an inflammatory spissitude and imperviousness of the blood, and that it is either forced into other improper vessels, or else adheres about the smallest extremities of the sanguiferous arteries, and that a very small portion of it can as yet be expressed; as also that death being now at hand, the extremities of the small exhaling vessels in the skin are so relaxed, as to transmit a thick and gross sweat. This has been well observed by HIPPOCRATES, *Cæterum universalem sudorum rationem novisse oportet. Alii enim fiunt ob corporum resolutionem, alii vero ob phlegmones vehementiam*; “Moreover the general cause or  
“ reason of sweats ought to be known;  
“ for some arise from a relaxation of the  
“ parts of the body, and others from  
“ the violence of inflammation.”

A swelling under the ear, not coming to suppuration, is destructive: when parotides arise in an ardent fever, it is a sign that the febrile matter is critically deposited towards the glands there seated;  
and



and as the blood in this fever is deprived of its more fluid parts, and at the same time has acquired a greater acrimony, therefore a mild resolution of these parotides cannot be expected, inasmuch as to effect that, requires a mild state of the humours, a sedate motion of them, and the obstructing matter not to be overcompact, therefore a suppuration only can take place here, which if it is not procured, a worse manner of terminating the inflammation must be expected. But sometimes the swelled parotides suddenly disappear from the morbidick matter returning again into the blood; whence the very worst returns, and even death itself may be expected to follow in ardent fevers.

It is a very just admonition of *Hippocrates*, to consider whether the fever is abated or increased; for if the fever suddenly increases when the parotides disappear, we know that the febrile matter mixing again with the blood, produces those disturbances, and  
that



that therefore a bad termination of the disease is to be feared. But if no such increase of the fever happens, there is reason to hope that the matter will in a little time escape by other passages, or be deposited upon some other part.—Neither yet must we believe health to be always an infallible consequence of parotides coming to suppuration in ardent fevers; for these crises, which are made by abscess or deposition, are always less safe.

A constipation of the bowels in ardent fevers is never of service; for since the bile, rendered more acrid or corrupt, kindles these fevers, and since even healthy bile is soon corrupted by a great heat, it must be evidently more useful for these foul humours to be discharged from the first passages, since otherwise, by the free access of air with heat and stagnation, they may degenerate into the most malignant putrefaction in a very short time. Hence it is that clysters are so useful in ardent fevers, not only inas-  
much



much as they dilate, relax, and cool, but also as discharge out every thing putrid lodged in the intestines. It is therefore no bad sign for the bowels to be looser than ordinary in these fevers.

An ardent fever differs from a putrid synochos or continent, inasmuch as its course is not one continued strain from the beginning to the end, but it is attended with remarkable fits of remission and exacerbation. It is distinguished from intermitting fevers, in that the force of the fever does not perfectly cease and from the slighter continual remitting fevers, by its intense heat chiefly, which is greater about the vital viscera, and more remiss towards the extreme parts, attended with unextinguishable thirst, and a dryness of the whole body.

An inflammation may arise throughout the whole body, although the blood continues to flow through the greatest number, if not through all the sanguiferous arteries. But that such an inflammation



Inflammation does attend in an ardent fever, we are taught from a redness in the face, and frequently of the whole skin, which sometimes continues even after death.—The inspection of bodies dying of this fever, demonstrates the cortical substance of the brain (in which naturally there is no red blood to be found) to be all over red, as if it were artfully injected. This is also the reason why such a great heat attends, even though such a great number of the small vessels are rendered impervious; for the red blood, inspissated by the loss of its most fluid parts, continues to be moved with a great velocity in the larger sanguiferous arteries.

They are much deceived who judge that sweat ought to be promoted, thinking thereby to evacuate all the febrile matter, because in an intermittent fever the fit goes off with such a sweat: for daily observations teach us, that those are more especially difficultly recovered from

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intermitting fevers who seem, as it were, to melt away by these most profuse sweats; neither is their cure practicable unless these sweats be first suppressed. Hence also the sweat which attends at the close of the fit, is to be moderately promoted by flesh broths, ptisans with wine, and the like, which afford plenty of liquid nourishment: but by no means by remedies, nor the heat of bed-cloaths, lest by such sweats those fluids fly off, which ought to be retained: the weakness and dejection which follow upon these profuse sweats, evidently demonstrate how prejudicial they are.

Quartan fevers, which have been disturbed by no powerful medicines, and have been gradually removed by a proper regimen in the spring season, have left people more strong and firm, and less subject to diseases, than before.—For these fevers contain a sort of epitome of that kind of life which CELSUS (in B. I. Ch. I.) recommends to some people:



If now it be considered that in the cold fit of intermitting fevers, the whole body trembles and shakes violently, often for several hours, almost as much in the internal as in the external parts; that the extremities of the arteries being contracted, propel the humours back

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into the larger trunks, as evidently appears from the paleness, and an opportunity they give for happily removing the obstructing matter adhering to the extremities of the arteries, it will not seem wonderful that many disorders should be thus relieved or removed, which are not at all affected by other medicines; more especially as soon after there follows a rapid motion of the humours through all the vessels; whereby the obstructing matter which was lodged in the viscera, being rendered moveable by the repeated concussions, is further resolved. Hence the reason appears, why these fevers so frequently remove the most inveterate disorders from the body, after they have been in vain attempted by other medicines.

The best methods recommendable towards the cure of these fevers, are such as conspire together with the disease itself, *to resolve what is concreted, to open the obstructed vessels, and thus to restore the equable and free circulation of the humours through*



*through all the vessels:* In the spring season, and in juvenile patients, the hotter medicines must not be used; autumnal fevers, on the other hand, more especially those which continue on until the winter, require warmer medicines, especially if the patient's strength is weakened by the disease, or if the body languishes by an advancing old age; for then the radix contrayerv. serpent. virgin. saffron, and the like most penetrating aromatics, are of the greatest use. In cold phlegmatic habits, alkaline salts are the best aperients, which yet are often injurious to warm and bilious people; and therefore those of the saline neutral kind are preferred, as nitre, sal polychrest. tartar. vitriolat. &c. Purges and vomits are not only useful, inasmuch as they evacuate, but also because they wonderfully stimulate and shake the frame, so as to change its whole condition. The cort. peruvian. should never be given in fevers, where there is

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a continual fixed pain, or the sense of an inward burning heat, with other symptoms of an inflammation.

Vernal intermitting fevers are of so mild a disposition, as to require no medicines, but generally go off spontaneously. They are only observed stubborn for some time in such people, who having their blood of a very weak crasis or texture, it is so easily dissolved, that they waste away with profuse and weakening sweats; but even in these they are curable, especially by the use of the bark; but autumnal intermittents are much more difficult to remove, and often require the greatest attention of the physician, with every assistance of art, in order to cure them.

Three things are chiefly to be considered in acute inflammatory diseases; viz. the acute continual fever, the inflammation, and the organ, whose functions are injured by the present inflammation.

In a true phrenzy the brain is primarily affected in an acute continual fever; that



that is to say, the cause of the disease is not produced in some other part of the body, and translated from thence to the brain, but is seated in the brain itself, or its investing membranes, from the very first attack of the disease, although by the violence of the fever the disorder may be increased which is already seated in the brain.—In the symptomatic phrenzy, the cause lodges in some other part, and is afterwards thence translated to the encephalon.

There can be nothing more dangerous than sleeping in the open air, with the head exposed to the solar rays.

A black tongue denotes either a deficiency of the thin lymph of the blood, or that the larger vessels, distended with the impervious blood, compress the adjacent smaller ones, whence the exhaling arterial ducts placed at the surface of the tongue become dry and gangrenous; hence a black tongue, especially if it be dry at the same time, presages the very worst condition of the humours.



A considerable degeneracy of the humours is scarce ever observed, without a disturbance likewise in the functions of the encephalon at the same time.

Lethargic, comatous, and cataleptick disorders, are of the worst presage in a phrenitis.

A flux from the bowels is salutary, not only because it discharges the morbid matter, but also because it empties the vessels in the abdominal viscera of the humours which flow thither, and lessen the resistance to the impulse of the blood; and by that means happily diverts the impetus and quantity of the humours from the head, which is an event of the utmost consequence in the cure of a phrenzy.

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*Of Quincies.*

A Quincy may be divided into that which happens without any manifest sign of an external tumour or visible



ble in the fauces internally; and that which is attended with some tumour obvious to the senses.

This first kind of angina occurs more seldom than the rest, and only after the body has been exhausted by diseases of a long continuance, and profuse and repeated evacuations, and is observed to be very dangerous and fatal, and is attended with an apparent dryness, paleness, and shrinking of the fauces, without any signs of inflammation concealed in the internal parts; sometimes indeed a pain and redness appears in the fauces, but it is only slight; nor are the parts affected thereby swelled, but rather seem to be considerably sunk or collapsed. Hence it is sufficiently evident why this kind of quincy is seldom curable, since all hopes are placed in a speedy restitution of the lost humours, so as to fill the empty vessels with good vital juices. But even deglutition itself injured, prevents such nourishment from being commodiously taken into the body, and at  
the



the same time, those things are deficient from which the assimilation of the ingested aliments may be expected, namely, a due quantity of healthy juices, and a requisite action of the vessels upon their contained fluids.

The physician must be extremely careful how he distinguishes this kind of angina from the rest, since the method of cure is so very different; sudden evacuations by bleeding, cooling purges, &c. would most certainly prove fatal in this case. An inflammatory angina may be occasioned by hard riding on horseback against a cold wind; for when a person rides violently against a sharp wind, the cold air enters the fauces every moment, and at the same time the vessels of these parts are powerfully compressed by the resisting air directed against them in an opposite motion, by which, as well as the coldness, they are too much contracted.

When the inflammation is in the windpipe, it is so much the more dangerous,

as



as it is seated nearer to the glottis and epiglottis, and it is much more so when seated about the rima of the glottis itself.

When the *styloceratohyoidei* muscles, and those others which are destined to draw up the larynx in the act of deglutition, are inflamed, it is evident enough that the most acute pain must follow. Such quincies are frequent; and the patients, if they do but attempt to swallow, are universally convulsed from the severity of the pain. But, as these muscles are deeply seated, upon inspecting the fauces, there is often no tumour to be seen; namely, when the disorder is seated in these muscles only, nor is there any tumour conspicuous externally in the neck for the same reason; but generally this disorder is seated only on one side, in which the patient has sometimes been able to point out the course and situation of the painful and inflamed muscle, at least in the beginning of the disease, for afterwards the inflammation frequently becomes universal,



versal. But this kind of quincy is easily distinguished, because respiration continues free enough, and the voice is not so sharp or shrill. Though this kind of quincy is not so fatal as others, yet is it not without danger, as well because it renders deglutition impracticable, as because the disease is frequently translated by a dangerous metastasis to the lungs.

When respiration is obstructed in an inflammatory quincy, the lungs cannot freely expand themselves, whence the right ventricle of the heart cannot readily expel its contained blood through the narrow extremities of the pulmonary artery into the left ventricle; and therefore the blood will begin to be accumulated in the lungs and right ventricle of the heart. The right auricle and venous sinus therefore will be unable to empty themselves; and the blood of consequence be likewise accumulated in these cavities. Hence the venal blood returning from the whole body through the upper and lower  
vena



vena cava, cannot enter into these cavities already filled; the veins will be consequently distended. But all the venal blood from the lips, tongue, and face, returns to the heart chiefly by the external jugular, while the blood from the interior parts of the head moves through the internal jugular vein.

When, therefore, the blood cannot pass freely through the jugular veins because of the obstructed respiration, all the blood vessels belonging to the external, as well as to the internal parts, will be more and more distended, since the arteries continue to send forward the blood, while in the mean time it cannot return by the veins. Hence the fauces, lips, tongue, &c. will be swelled; and the eyes, overcharged with blood, will look red and protuberate in a frightful manner; the tongue swelling, can be no longer contained in the mouth, but will be thrust out, distorted, and appear of an ugly livid colour, froth and spittle being at the same time discharged from the mouth.

And



And as the blood vessels distributed through the encephalon may become distended from the same cause, the soft substance of the encephalon will be compressed; whence the sight, hearing, and touch, will be rendered dull, all the functions of the brain will be disturbed, and at length entirely abolished; but the snoring or rattling attends when the viscid froth begins to fill the whole mouth, fauces, or lungs; and the blood vessels of the lungs being distended at the same time, the cavities of its air vessels are diminished. Hence the unfortunate patient suffers all those disorders which happen to such as are strangled with an halter; only in this disorder they are much more unhappy, as they are obliged to suffer these bad effects by slow and gradual advances.

The best of all methods for curing an inflammation is that by resolution or dispersion; and therefore this course is to be pursued before any other, provided there is any reason to expect it will succeed;



ceed; but more especially this method is required in the cure of an inflammatory quincy, since a suppuration is attended with so much danger from the increased tumour compressing the organs of respiration and deglutition; and likewise because there is reason to fear, lest the abscess breaking, should discharge its matter into the windpipe, and suddenly suffocate the patient.

We may assert, and not without reason, that there is hardly any acute inflammatory disease more mutable: it is frequently seen in practice that the inflammation occupying the tonsil on one side, suddenly abates, and affects the tonsil on the other side. Nor is this all, but it likewise frequently removes to other and very distant parts of the body.

This kind of quincy ought to be well remarked, because I have seen some mistaken in supposing a suppuration already formed, and believing the white spots to be the apex to the abscess now ready to break, especially if they were not

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this case all the endeavours of art are to be used to promote the suppuration as fast as possible, that the patient may be speedily relieved from the extreme difficulties with which he is oppressed.

It will be expedient for the patient to be continually holding in his mouth a warm gargle prepared from linseeds, mallows, marshmallows, and the like most emollient remedies. For thus the inflamed parts will be continually fomented, too great a dryness of them will be prevented, and the crude inflammatory matter will be happily changed or concocted into laudable pus. By the same means, likewise, the abscess seated in the fauces will be best disposed to break upwards, and discharge the collected matter into the cavity of the mouth, which is much the safest, since if the abscess breaks downwards towards the fauces, there may be danger, lest the matter should slip through the opening of the glottis, so as to threaten the patient with immediate suffocation.

We are sometimes obliged, in a suppurative quincy, to repeat bleeding, though

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the symptoms denote that an abscess is now forming ; the reason is, because the swelling of the affected parts being increased at the time of suppuration, often excites a new and dangerous inflammation compressing the parts adjacent ; we are therefore obliged still further to exhaust the body, that the vessels may collapse, so as to prevent the suffocation, which is often to be feared in this disease.

When the disorder is seated in such parts as cannot be seen, we know that the inflammation is tending towards a gangrene, if the symptoms be most violent, the pains most acute, and joined with an intense fever ; and if these continue two or three days, without abating, and the patient is not in the mean time suffocated. But that a gangrene is already present, we know if the symptoms cease of a sudden, without any favourable signs ; as for instance, if the pain goes off, and the swallowing or breathing, before very difficult, now becomes free ; and yet there are no signs denoting that the matter,



ter, or the disease, is by a metastasis translated to some other part, which frequently happens. This diagnosis is confirmed by a cadaverous countenance, a coldness and livid colour in the extreme parts of the body, with a weak and unequal pulse, which are the signs usually attending a fatal gangrene in these parts.

This disorder seldom or ever admits of a cure; but a gangrene, which arises from a deposition of malignant humours upon these parts, without a previous inflammation, is indeed dangerous, yet frequently curable, provided effectual remedies are immediately applied. A convulsive angina, tho' it seldom occurs, yet has it sometimes been observed to happen.

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*Of a true Peripneumony.*

**A** Peripneumony is owing to an impervious blood, from an inflammatory spissitude adhering in the narrow extremities of the arterial vessels of the lungs only.



The lungs are frequently and powerfully affected by the changes of the air, which, if moist, will weaken the fibres of the pulmonary vessels, so as that they cannot well resist the impelled fluids; and there will therefore be danger, lest the relaxed vessels admit grosser particles of the fluids than can pass through their extremities; and this more especially happens when heat is joined to a moisture of the air, and thus occasions an inflammation. But, on the other hand, if the air offends by too great a dryness, so as to deprive the internal surface of the windpipe and bronchia of its natural moisture, these parts being rendered less flexible, will be more difficultly expanded or dilated by the inspired air. Moreover, the ultimate small mouths of the exhaling vessels, which open in the surface of the air-vessels of the lungs, will be dried up so as to resist the impulse of the fluids, whence obstruction and inflammation may follow; and this more especially, as by a dry and hot air the



most fluid juices are dissipated from the body, whence a greater thickness or tenacity of the blood will arise from the same cause. But too great heat of the air will produce the same effects as the dryness of it; but if the heat of the air be joined with moisture, it may prove injurious by too much relaxing the pulmonary vessels.—Intense coldness of the air, is, above all causes, most apt to produce this disease, for by cold and frost the particles of the blood are con-creted together.

Straining, wrestling, &c. may occasion a peripneumony; for then almost all the voluntary muscles are in violent action; whence the motion of the venal blood is accelerated almost as much as in running. But moreover we see, that all those who wrestle or struggle with each other, or by great straining endeavour to raise weights or remove certain obstacles, breathe in a great quantity of air, which they retain a long time before it is expired; and this they continually repeat.



But the air retained in the warm lungs becomes rarefied, and presses so much the more powerfully upon the pulmonary vessels, as it is expanded by heat: thence it is evident that the pulmonary vessels must be less capacious, while at the same time the motion of the venal blood is accelerated towards the heart, into more violent and frequent contractions; but since the pulmonary vessels are then compressed or straitened by the rarified air, the blood will more difficultly pass thro' the lungs; and only the more fluid part of it will be able to flow through the lessened extremities of the vessels, while the thickest part will be accumulated, and occasion obstructions and inflammations.

Singing and bawling may also produce this disorder; for the voice is formed by an expulsion of the air contained in the whole capacity of the lungs, drove out by the powers contracting the thorax; yet so, that the air thus drove through the windpipe, strikes against the ventricles of the larynx, arytenoide cartilages, and

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rima of the glottis. For when the rima of the glottis is too much dilated, the air passes out very freely, and produces no sound or voice, as is evident in those who endeavour to sound a deeper tone than they are able; but musicians have demonstrated that the difference of the voice, with respect to acuteness and gravity, depends upon the different aperture of the rima of the glottis, and the increased or diminished celerity with which the air is expelled. When, therefore, people endeavour to sing the most sharp tones, the causes contracting the thorax, expel with a great force the air contained in the lungs through a very narrow aperture of the glottis; whence the compressed air violently re-acts upon the cavity of the lungs, in which it is contained, so as to hinder the free passage of the blood through the lungs. The same is also true in bawling aloud, when the voice always forms a more sharp tone, the more violent it is. The appearances observable in those who sing or bawl



aloud, evidently prove the truth of this assertion; for in such the face always appears red and turgid, the eyes are suffused with blood, the veins of the forehead and neck swell, &c. all which evinces, that the venal blood is accumulated about the right side of the heart, because it cannot freely pass through the lungs.

Many causes concur in a peripneumony to render the inspired air very hot; for here the lungs are stuffed up with the thickest, or red part of the blood, which we know to be most disposed to produce heat, and to retain it a long time when produced; through the vessels of the lungs, not yet impervious, but lessened by the adjacent, obstructed, and distended vessels, the humours are very swiftly transmitted, whence a greater heat must arise; add to this, that the lungs distended with impervious blood cannot be sufficiently expanded, and therefore can take in but a small quantity of the cool air at such inspiration.

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From all these concurrent circumstances we may easily conceive the reason, why the expired air is perceived extremely hot in peripneumonick patients. A yellow spitting, intermixed with small particles of blood, is of the best import in this disease; for the thickness and yellow coloured note that a concoction of the morbid matter is already begun.

A peripneumony may be carried off by urine, but then it is necessary the discharge should be very copious, it will otherwise not suffice; but the discharge ought also to happen before the seventh day, since, if this disease continues longer without any salutary discharge, there can be no hopes of curing it without some other disease succeeding upon it. A white and uniform sediment in the urine denotes safety to the patient and shortness of the disease; so is a sediment at first red, and afterwards changing white by degrees, because it denotes a perfect concoction and change of the morbid matter.

We cannot expect a perfect cure of a peripneumony, unless the disease be  
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slight, that is, the inflammation seated only in the bronchial artery, or in but a small part of the pulmonary artery.

HIPPOCRATES condemns a simple yellow spitting as dangerous, because all the obstructed vessels are not set at liberty, for if they were, some red bloody streaks would appear intermixed with it: he likewise pronounces a white, viscid, and uniform spitting to be useless, because it contains none of the morbid matter, but consists only of the inspissated mucus lubricating the bronchia, compacted into a roundish figure in the cells of the lungs.

Every suppuration is attended, more or less, with a fever: this fever generally increases towards evening, when the crude chyle formed from the aliments is moved through the vessels with the blood, and from the action of the lungs weakened in this disease, is not so soon assimilated or subdued, but retains its own crude nature for a long time, before it can acquire all the qualities of our animal



mal humours; and therefore it increases the fever, either by forming an obstruction, or by its stimulus, or by both together.—Even in healthy people the quickness of the pulse is increased towards the evening; and for that reason all diseases which are attended with an increased velocity of the circulation, grow worse towards evening. But since the vital powers are weakened or exhausted by the long continuance of the disease, and at the same time the course of the blood is impeded through the lungs, the reason, therefore, is sufficiently evident why the pulse is weak and soft.

Night-sweats almost constantly attend an abscess of the lungs, as they likewise attend upon those who have a consumption of the lungs, with a purulent spitting: for it appears from physiology, that the action of the lungs upon the blood serves, among other uses, to form a most exact mixture of all the humours, and to give the blood a due degree of density



density or firmness, as well as to work up the chyle to that perfection which is natural to our healthy humours. But the chyle is always lighter than the blood or its serum; and therefore the action of the lungs and arteries is to compact the chyle, and give it a greater solidity, that is, to reduce more of its matter into the same or a less space or dimensions. But when the action of the lungs is weakened by an abscess formed in them, the texture of the blood will be rendered less firm, and the mixture of all the parts of the blood with each other will be less intimate or exact. Therefore, when the whole surface of the external skin is thoroughly heated by the warmth of the bed, the thinnest parts of the blood from the increased motion of the humours, by the continual slight fever, will be expressed in the form of sweat, that when such a cacochymia takes place in our humours, as renders their parts less assimilated and unequally mixed, there then ensues a propensity to sweats from even slight causes.

But



But all these effects will be still more increased, because the matter confined in the abscess of the lungs being attenuated and absorbed by the veins, will very much increase this cacochymia, and continually dispose the blood to be more inclining to a putrid dissolution. But this sweat will appear chiefly about the throat and forehead, because the pulmonary abscess impeding the free passage of the blood through the pulmonary artery, will, at the same time also, prevent the return of the venal blood from the parts above, whence all the vessels of those parts will be more distended, and consequently, *cæteris paribus*, the sweat will be more conspicuous, often gathering in drops when the patient is weak; and this is always of bad presage.

The urine is almost constantly observed to be frothy in this case; so that, upon shaking it, a froth often continues upon the surface for several hours, whereas healthy urine very soon loses the froth which has been raised by a violent shaking;



king; and therefore this urine is bad, because it deviates in its qualities from that in a healthy state. The urine of healthy people is always saponaceous, as the oil being mixed with the more acrid salts of the blood, is changed into a soap dissolveable in water: but at the same time all these are so highly attenuated in healthy urine, that it has no ropiness or viscosity capable of maintaining a lasting froth. But as in this disease there is an imperfect assimilation of the humours, and the most fluid and moveable parts of the blood are dissipated in sweats, it is no wonder that the urine thus degenerates, so as to resemble an unactive, viscid, and soapy lixivium; yet the same sort of urine is observed in other diseases of the lungs, as when, for example, that viscus is stuffed with a ropery viscid phlegm; we are not, therefore, from this symptom alone, to form our opinion of an abscess in the lungs: but if such urine appears at the same time with the signs before mentioned, it

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confirms the diagnosis; but that great paleness, leanness, and weakness, must attend here, is evident enough from what we said before; for the blood being broken or dissolved, from the weakness of the assimilation, causes paleness; and the night sweats, hectic fever, and loss of appetite, are the causes of leanness and extreme weakness.

Although the matter contained in a vomica of the lungs should be absorbed by the veins, and be deposited by a metastasis on some other parts of the body, yet when this is done, the ulceration will continue in the lungs, whence new matter will, in a short time, be collected again in the same place; and therefore no great benefit can be expected from such a translation of the matter. But when the inflammatory matter, being subdued and rendered moveable, passes on into the veins before an abscess is formed, and mixing with the blood, is afterwards deposited upon other parts of the body, the lungs may by that means



means be freed from the disorder, and when once freed, they may enjoy the same state which they had in health.

When matter is moved with the blood through the branches of the descending aorta, a great part of it will be conveyed, both by the cœliac and mesenteric artery, through the chylopoietic viscera, and from thence passing into the vena portarum, it must make its way through the narrow vessels of the liver, in which organ we know the passage of the humours is proportionably always more difficult, as the venal blood must pass on through the narrow ends of converging vessels, without being assisted by the impelling force of the heart. It will therefore not appear wonderful if from hence an obstruction arises about these parts, and is followed with the signs of a slight inflammation. Now, whether this be the genuine cause of the symptom observed, or whether it be from some other less known cause, it is sufficient for the physician that he is assured this presages a  
future



future abscess about the legs; but they should be the signs of a slight inflammation only, and soon disappear again; for if they continue, there would be reason to fear the morbid matter would lodge itself in the liver, with more dangerous events. A vomica of the lungs may easily be distinguished from a scirrhus swelling of those parts, because the former daily increases in bulk till it breaks, whereas a scirrhus hardness of the lungs continues a long time in the same state.

It is demonstrated that the inspired air serves to cool the blood, which acquires a most intense heat by its rapid motion through the pulmonary artery; which refrigeration is so necessary, that an animal being deprived of it for a few minutes, dies, and presently falling into the most horrid putrefaction, exhales an intolerable vapour or smell. But violent inflammation is attended with a great heat; and the turgid inflamed vessels afford but little space for the inspired

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air, whence we may expect the blood will be much less cooled. It is therefore evident, that in a violent inflammation of the lungs, all those causes concur, which are able to produce a sudden mortification and speedy putrefaction of the part.

The strongest man labouring under a peripneumony, immediately becomes so weak that he cannot lift up his hand, owing to an impeded influx and pressure of the nervous fluid into the muscles: now in a violent peripneumony almost all the blood is collected betwixt the right ventricle and the extremities of the pulmonary artery, while at the same time the free return of the venal blood from the brain is impeded, whence the encephalon is compressed: the left ventricle of the heart, in the mean time, receiving scarce any blood at all, will be unable to send a due quantity by the carotid and vertebral arteries to the encephalon; and therefore the most powerful causes of weakness will concur.

Revulsion, which is so necessary in the cure of an inflammation, is here impracticable;



practicable; for all the blood of the whole body must pass once through the lungs in the same time that it is moved through all the other parts of the body; consequently, the motion of the blood through the lungs cannot be much impeded or lessened by any art, if life be still remaining. All the fluids of the body flow to the heart and lungs, as to their original source, and thence supply every individual part again.

When the whole substance of the lungs is inflamed, the right auricle and ventricle of the heart will be filled, the course of the blood through the lungs being obstructed; whence the coronary veins will not be able to empty themselves, which will cause an inflammation in the very substance of the heart itself: and since the heart is suspended in the pericardium almost in an horizontal direction by its four large blood vessels, in such a manner as that the right auricle and ventricle of the heart



incline towards the fore part of the body, the reason appears evident, why the right auricle and ventricle being very much distended while the left are almost empty, the heart will be thrown forward, so as to touch the side of the thorax, which must necessarily terminate in death.

A bilious spitting is bad, if purulent, and it appears after the sixth day; for such a discharge seems to denote that the inflammation of the lungs, which attended in the beginning of the disease, is now changed into a suppuration; while at the same time there is a new inflammation exciting that bilious, or yellow spitting, which is not yet concocted or matured, whence the patient at that time labours under a double disorder. If a very little blood is intermixed with good and concocted spitting, it is esteemed one of the best signs; for then the obstructing matter escapes (*per anastomosis*) by a dilatation of the mouths of the arteries, which open in the trachea, where-



by the lungs are happily set at liberty. But when the spitting is very bloody, there is reason to fear that the impetus of the vital humours from the adjacent heart is so very great, as to burst the very small and tender vessels of the lungs, and extravasate their blood.

A simple yellow spitting denotes that the grosser parts of the humours are accumulated in the lungs, while the thinner parts only pass through them, which is a most fatal circumstance. Thick and white spitting is nothing more than the mucus of the lungs collected in the bronchia, where it is thickened by heat and stagnation, so as to retain the round figure which it acquired in the cavity of the lungs, even after it is spit out; whence it appears, that by such a spitting there is none of the morbid matter discharged which oppresses the lungs, and therefore is a mortal sign.

Myrrh, frankincense, gum sarcocolla, opopanax, &c. made up into a bolus with turpentine, Peruvian balsam, &c.



are very proper taken several times in a day with smooth balsamic emollient decoctions; for by these mild and native balsams we deterge the ulcerated parts, and when they are cleansed, dispose them to consolidate and heal.

Riding on horseback is also of very great service, where the strength will admit of it; for by this means the fresh air, which every moment enters the lungs, sweeps away, or shakes off the matter from the ulcerated parts, and removes the load oppressing the lungs by those concussions of the body which arise from the motion of a horse, and this even without a cough, or at least with a very slight one.

It is observable in those who have a pulmonary consumption, and daily evacuate by spitting the matter collected in the lungs, that towards the evening, when their hectic fever is usually much increased, the spitting becomes suppressed, and the anxiety augmented; but in the morning the fever lessens, and the spitting



ting comes on again, to the great relief of the patient.

That violent passions of the mind have an effect on the lungs, is observable from the alteration which is thereby made in respiration.—A person seized with great anger, immediately breathes very strong and pants ; so a man suddenly struck with a panic, perceives a great oppression about the breast, fetches very troublesome sighs, &c.

If any disease, by its false appearance of mildness, deceives the less skilful, it is the *false peripneumony*, for here there is no intense heat, great fever, or other violent symptoms which usually attend a true peripneumony ; for the material cause of this disorder is a sluggish inactive phlegm, which begins slowly to be collected in the narrow extremities of the pulmonary arteries. But among those signs which inform us that a sluggish phlegm is moved together with the blood through the vessels, and is rendered less pervious, are reckoned a slight weariness



and greater weakness, together with an unusual dullness.

But when that sluggish phlegm begins to adhere to the vessels of the lungs, the free passage of the blood, from the right to the left side of the heart, is then impeded, when the patient endeavours to breathe with greater efforts to forward the course of the blood; and from thence there arises a panting, with complaints of a troublesome anxiety and oppression at the breast: but in the mean time there are no signs, or at least very slight ones, of any fever attending: then follow shiverings, not confined to any particular part, together with the attack of a slight fever, so that at one time the patient is hot, and at another time cold again. But by degrees the lungs are more and more stuffed up, attended with a disagreeable rattling; the shortness of breath increases, together with weakness, and death ensues. *Sydenham* is of opinion, that the absence of the fever, or the reason why it is scarce perceptible, is



is partly owing to circulation being interrupted by the obstruction of the lungs, and partly because the blood, charged with a great quantity of phlegmatic matter, cannot be rarefied or heated into an ebullition. Hence the reason is evident, why there are scarce any signs appear either from the urine or pulse, from which we may judge of the fatality of this disorder.

Redness of urine is esteemed a sign of internal heat, and yet in this distemper such urine may be easily discharged, if we consider that those are invaded with it chiefly who are short and fat; and when in these people the inactive oily glue is dissolved by motion, heat of the air, &c. and suddenly mixed with the blood, an imperviousness of the humours of the worst kind will be produced; and it is these oily parts which being mixed with the salts of the urine, which give that redness to it.

So soon as the shortness of the breath and oppression perceived about the breast  
by



by the patient, denote that the lungs are stuffed up, a vein must be immediately opened, (and that from a large orifice, lest the phlegm with which it is charged might obstruct a smaller opening) for thus the mass of fluids to be moved through the lungs will be lessened, and, together with the blood drawn out, will be removed: part of the phlegmatic matter flowing with the blood through the veins, the febrile motion will be lessened, if any there is, from whence a greater impaction of the viscid phlegm into the narrow extremities of the pulmonary arteries might be apprehended, and the vessels being likewise unloaded, convenient room will be made for diluent and attenuating medicines. After bleeding a clyster should be immediately administered to cleanse the bowels, made up of honey, nitre, the yolk of an egg, and barley water; these clysters should be thrown up daily, till respiration becomes easy, and the strength of the pulse enlarged, and by that means we know the lungs to be relieved.

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The legs and feet may be fomented with warm baths ; by which means they being relaxed, the panniculus adiposus may swell and receive into its cells a large quantity of the rosey phlegmatic matter, which may be thus drawn off from the lungs as much as possible.

Large blisters applied to the legs and thighs may be of great service also.

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*Of a Pleurisy.*

**A** Pleurisy is said to be present when a person labours under an acute continual fever, with a hard pulse and a sharp pricking inflammatory pain in the side, which greatly increases in the act of inspiration, but abates in expiration, or by holding in the breath ; also becomes milder when the breathing is performed by the abdomen chiefly, without moving the breast ; a cough likewise attends, which is almost incessant, and which exciting great pain, is therefore stifled or suppressed by the patient.

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An acute continual fever must accompany this pain; it cannot else be properly called a pleurisy.—Hysteric and hypochondriac persons have very sharp pains about them, but then they are not attended with a fever.—*Pain*, therefore, and an *acute continual fever* are the *pathognomonic* signs of a pleurisy; and this pain is *sharp and pricking*, arising from a distension of the inflamed vessels.

A hard pulse attends most of the more acute inflammatory diseases, from the more dense and compact blood passing more difficultly through the extremities of the capillary arteries: but this symptom may sometimes deceive us, when the patients cannot inspire for the severity of the pain, to avoid which they almost suffocate themselves; for then a peripneumony succeeds in consequence of the pleurisy, and the pulse feels small and soft.

But since, when the thorax is dilated by inspiration, the inflamed parts are more stretched, the pain will consequently be



be at that time increased; and for the same reason it will be slighter during expiration, and when the sick hold in their breath. Hence it is that those who have a violent pleurisy scarcely breathe, to avoid the severity of the pain, whence they almost suffocate themselves. Such patients, therefore, are often eased in their pain, while the thorax remains bound up with a roller, so as to allow little or no dilatation to the breast in respiration; for in that case inspiration is principally performed by the abdomen without moving the thorax: for in the act of inspiration the thorax is dilated, not only by the motion of the ribs, but likewise by that of the diaphragm, which being drawn downwards enlarges the capacity of the chest, while at the same time it lessens those of the abdomen; whereupon the abdominal viscera, being compressed, urges against the muscles of that venter, and thrusts out the belly. Therefore, while the thorax is thus immoveably bound up, there may be still a  
suffi-



sufficient space left for dilating the lungs by the inspired air, while the diaphragm is drawn downward; which now probably acts with a greater force than when the thorax is conjunctly dilated with it: thus we see the manner in which the breathing, absolutely necessary to life, may be still carried on. But the breathing will also suffer more or less impediment, according to the situation of the inflamed parts.

A cough is almost a perpetual attendant on a pleurisy; and since expectoration is of the utmost importance in a peripneumony, and since a pleurisy itself frequently terminates that way, it behoves for that reason every skilful physician, in the beginning of this disease, ever to observe whether the cough be attended with a spitting, and of what kind it is; for a dry pleurisy is by all condemned as the most dangerous, troublesome to treat, and difficult to bring to a concoction or crisis; it either carrying off the patient with great rapidity, or continuing  
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for a considerable time ; and even a spitting intermixed with blood, in this case, is far better than where there is no expectoration at all.

There is a very near affinity betwixt a pleurisy and a peripneumony, and they often arise from the same cause ; both are attended with a cough, and a pleurisy is near as often relieved by a spitting from the lungs. A peripneumony often accompanies a severe pleurisy, or almost constantly succeeds it : physicians therefore of the best judgment in practice have always been of opinion, that the lungs are the seat of both these maladies.

HOFFMAN was of opinion, that a bastard, or false pleurisy, occupied the external parts of the breast only by its inflammation ; but that if it invaded the surface of the membranous substance of the lungs, like an erysipelas, it then constituted a true pleurisy ; and if it yet descended deeper into the substance or body of the lungs, it then became a peripneumony.—Certain we are, that the  
pleura



pleura alone is not solely or constantly the seat of a pleurisy: we have even found a phlegmon seated within the fat and intercostal muscles.

PETER SERVIUS, after opening three hundred persons who died of pleurisies at *Rome*, always found one lobe of the lungs, corrupted and distended with a putrid matter; but the pleura appeared not at all affected, or at most but slightly. Indeed, if we consider that a pleurisy and peripneumony are often conjoined, and that it is not from the pleurisy only that the patient dies, because the pleura and intercostal parts are inflamed, but oftener because the immense pain occasions the necessary motion of the thorax to be suppressed, whereby the course of the blood through the lungs being stopped, brings on a fatal peripneumony; it will evidently appear, why in bodies dying of a pleurisy, the disorder should rather be constantly found in the lungs, while the pleura appears but lightly disordered.—For it is observable, that SER-

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vius does not deny the pleura to be affected, he only confines it to a small degree.—The proximate cause of death was by him, therefore, ascribed to the lungs, although the original distemper might have previously been seated in the pleura, or in the adjacent muscles and panniculus adiposus; however, we are confirmed by a great number of observations, that the pleura is truly affected in this distemper.

The true seat of this disorder is in the pleura, incumbent on the costal muscles, and contiguous to the fat.

It is an observation of the learned TRILLER, that the pleurisy which attacks the right side, is not so dangerous, stubborn, or inveterate, as when the left side is affected: it proves often fatal on the third or fourth day, especially in persons who are very hard drinkers.

An original pleurisy generally requires copious and repeated bleeding, the symptomatical, or that which happens in con-

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sequence



sequence of other epidemical diseases, will not bear it so well, at least no repetition of it; and therefore the lancet should be sparingly ordered. Pleurifies are seldom more severe, or more suddenly fatal, than when they happen upon excessive and sudden drinking of cold liquors, when the body has been much heated; and the reason is pretty evident, for the blood of a healthy person, drawn from a vein into cold water, instantly concretes into threads of an almost solid consistence. Now when plenty of cold drink is swallowed down the œsophagus, which descends in its course very near the trunks of the intercostal arteries, it becomes filled or distended with it; the whole stomach, in like manner, being also charged with the cold drink, instantly imparts the unusual coldness thereof to the adjacent diaphragm, liver, spleen, &c. the trunk of the ascending cava, and the large right sinus of the heart, incumbent on the thin tendinous part of the diaphragm, are likewise affected,



affected, by disposing the blood there collected to a concretion, and impede its passage, which it ought to make through the lungs.

The breathing is greatly injured, because at the time of inspiration the ribs must, of necessity, be drawn from each other; and the inflamed parts be consequently stretched and extended, and so cause a great increase of the pain. Upon this account such miserable patients hardly breathe air sufficient to dilate the lungs; whereby the right ventricle of the heart becomes unable to empty itself so freely as it ought to do. The blood, therefore, returning from the head by the jugular veins, cannot now find any admittance into the right sinus and auricle, already full; the whence internal parts of the encephalon are compressed by the turgid vessels, and the patient will become dull, stupid, and less sensible of the pain; and while the lungs are gradually more and more overcharged with blood, they soon expire, suf-



focated ; and it must be remarked, that pleuritic patients perish in the height of the distemper, not from the inflammation of the pleura, nor of the parts incumbent on the ribs, but are suffocated by a repletion or oppilation of the lungs, for want of a free respiration.

It is to be observed, that when a pleurisy has continued three or four days, without having had any necessary assistance, it seldom or never is cured by an innocent or mild resolution ; for then the violence of the disease usually gives rise to other maladies which seat themselves in the body, and more especially in the lungs.

TRIILLER has very justly observed, that pleuritic patients generally escape by the help of nature, even without venæsection, provided a copious flux of florid or purple blood from the nose, happens between the *first and the fifth day*.

*Urina subrubra in pleuriticis* (says HIPPOCRATES) *habens læve sedimentum, securam judicationem indicat.* “ A pale red-

dish



dish-coloured urine, with a light sediment, in pleurifies, denotes a sure and safe crisis." If such an urine flows plentifully, and generally deposits such a sediment, with relief of all the symptoms, we are then sure the morbid matter is discharging itself; and we have more especially hopes that the disease will terminate that way, if this happens in the beginning, before many of the humours become vitiated by a long continuance of the distemper; for if this kind of urine happens towards the close of the disease, it will scarce ever be removed by that discharge only.

When the pain invades the back, shoulder, or arm, and that of the pleuritic side evidently abates, it is a very happy sign; for those patients most generally recover. It is worth observing, that *these pains happen ofteneſt upon the ſixth day of the diſeaſe*—This metaſtaſis, however, does not appear to cure the diſeaſe, but is rather the forerunner of a ſalutary criſis.



LANCISIUS often observed, that pleuritic patients, before the fourth day, expectorated a bloody matter, which afterwards appeared white and concocted; and that they did not draw this up from the bottom of the breast, but that they pointed to the place under the sternum, where the *vena axygos* opens into the *cava*.

All expectoration in peripneumonies are bad, which do not relieve the pain; but such as do, are certainly the best of all.

A white, concreted, or pus-like expectoration has been often known to cure a pleurisy; and even in a woman advanced into the fifth month of her pregnancy, when this spitting came on plentifully on the second day of the pleurisy, the symptoms were all immediately relieved, so that the disease itself was cured by the fourth day; a vein was opened on the first day of the distemper, but it was not repeated again, there being no occasion for it: this is the more remarkable, because HIPPOCRATES absolutely pronounces



nounces a pleurisy fatal to women with child, and declares in general, that all acute cases are fatal to pregnant women.

Expectorations of a yellow colour, intermixed with blood, are salutary; *Mitissimæ enim pleuritides sunt in quibus sanguinolentum spuitur*, is an axiom of HIPPOCRATES. “Those are the mildest  
“ pleurisies in which the spitting is some-  
“ what bloody:” but here the physician must avoid the lancet; for otherwise he suppresses expectoration, and kills the patient.

In a violent pleurisy, although by a happy treatment the matter of the distemper may be dissolved, and rendered fluxile, it hardly ever once happens, that this matter can be again assimilated with the healthy juices, so as to circulate with them freely, and without prejudice to the vascular system, which this matter almost constantly stimulates to such a degree, as obliges them to throw the same off by one outlet or another, in a sensible discharge from the body. This cau-



tion is very necessary here, lest any one should fear to order bleeding in the beginning of a pleurisy, thinking it might hinder the said salutary endeavours of nature to expel that matter.

Neither should we neglect to open a vein, even while the menstrual flux is upon the patient, provided there be a great difficulty of breathing; nay, the good effects of it have been very apparent, even in child-bed women, seized with a pleurisy, notwithstanding the lochia; and this is confirmed by the observations of LA MOTTE, who has repeated bleeding in the arm in these cases, even where the flux has not been very small.

It sometimes happens, in a pleurisy, that the breast can by no means be dilated or moved, upon account of the violent pain, whence the lungs transmit but very little blood; for which reason the large veins are very full and turgid, but the aorta receiving only a little blood, does not press forward that which is contained in  
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the veins with any great force; so that, upon opening a vein, there often issues out but a small quantity of blood: but as soon as the patient expands them by sighing, or shocks them by coughing, the blood issues forth with impetuosity. This was observed in a pleuritic woman by TULPIUS, who advises physicians, therefore, in such cases, to persuade the patients to cough; but as the pain is often so very severe, that the least dilatation of the breast throws them into convulsions, it is not an easy matter to persuade them to do it.—Under such circumstances, it will be expedient to give them a pinch of some sternutatory, or a spoonful of sour wine or hot vinegar, to drink by way of pretence as a cordial, whereby an involuntary cough may be excited, which may suddenly remove the pain, or greatly abate it at least.

We should be cautious to avoid fainting in bleeding, lest a peripneumony should follow; for while the heart ceases to move in a fainting, the blood in the  
right



right sinus, auricle, and ventricle, often stagnates for some minutes; and the blood being in this inflammatory malady greatly inclined to inspissate and concrete, it will, in some degree, enter before the patient can be recovered from his fainting fit; it may therefore adhere and become impervious to the smaller vessels of the lungs, through which it ought to have passed; and by that means be productive of a peripneumony, which would be of much more dangerous tendency than the pleurisy itself.

TRILLER gives us a history of a case, to prove how effectual bleeding may be, even when the patient is extremely weak, and all the symptoms are, notwithstanding, aggravated to a degree of violence. In a robust youth, very fond of hunting, under a most severe pleurisy, after two plentiful bleedings, the disease seemed to change for the better; but on the fifth day the symptoms returned with great violence; so that, in spite of clysters and vesicatories, the patient seemed to be in  
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the most imminent danger. A large orifice was made in the veins of both feet, now grown so cold, that though they were fomented with warm water, not a drop of blood came; upon which water was continued to be poured upon them, so hot as to fetch off the cuticle, and then the veins bled plentifully enough; and so effectually, that the patient, almost half expiring, revived, and was most happily cured of this most dangerous disorder.

SYDENHAM bled his pleuritic patients, as soon as he was called to them, from the arm of the affected side; but when he afterwards repeated this venæsection, he makes no mention of the part from which the blood was taken. HILDANUS observes, that he seldom or never found the desired success from bleeding in the arm of the opposite side of the pleurisy. And TRILLER confirms this also, as to the first bleeding; for the second he rather prefers the foot of the same side; and then in the opposite foot, if there should be a necessity for a third or fourth bleed-



bleeding; but he very justly remarks, that the first bleeding should of all be the most copious.

In this case a solution of Venice soap, in equal parts of warm water and new milk, has been found a comfortable fomentation; or half an ounce of soap to a pint of the emollient decoction, in which flannels were dipped and laid upon the side, and hot tiles placed over them, in order to keep the fomentation from cooling too soon.—In the night-time, that the frequent renewal of the fomentations might not be troublesome, the side may be first rubbed with unguent. de althæa, and then be covered with a melilot plaister.

A simple decoction of barley, with oxymel and nitre, is often sufficient here, since this includes all the qualities necessary towards a cure; for it dilutes by being watery, relaxes and eases by the mealy substance of the barley that is intermixed with the water, while the honey and vinegar very well dissolve inflammatory



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mild and discutient fomentation applied to the inflamed diaphragm. Great mischief may be feared from an abscess of the diaphragm draining into the cavity of the abdomen: for if it be considered that the diaphragm is always in motion, and that the circulation through its vascular fabric is very rapid on account of its vicinity to the heart, we may easily perceive that a large quantity of matter must gather there in a short time; and that the ulcer of the diaphragm will admit of no cure, more especially when it is constantly moistened by the confined matter, rendered acrid by long standing. It is true, indeed, the matter poured out will, by its own weight, drain to the bottom of the abdomen; but being long confined and corrupting there, its putrid vapours will infect all the viscera, and will itself corrode all the parts within its reach.

Great caution is necessary towards the close of a pleurisy with regard to the diet of the recovering patient, for too sudden a repletion would endanger a fatal relapse.

*Of*



*Of an Hepatitis, and of the several kinds  
of Jaundice.*

**T**HE arteries which branch to the liver are but small, in proportion to the size of so considerable a viscus, and the blood which is driven through the liver, from the trunk of the vena portarum, moves on but very slowly, as it does in the veins, having now no further assistance from the moving powers of the heart and arteries: on these accounts, probably, a true inflammation of the liver is not so frequent as in other parts; but very stubborn and chronick obstructions are therefore much oftener formed in this tender gland.

Since an inflammation can take place only in those vessels, through which the humours are conveyed with a directed motion from the basis, towards the apex of the cone of the vessel; 'tis therefore evident, this malady may be seated in the branches of the vena portarum, dispersed



perfed through the liver, as well as in the branches of the hepatic artery; for all the venal blood returning from the other viscera of the abdomen, flows together into the trunk of the vena portarum, and from that venal trunk it is again propelled throughout the liver, by converging branches of the said trunk; but anatomical injections have also taught us, that the branches of the hepatic artery, which convey blood for the nourishment of this viscus, are distributed throughout every part of the liver, as well as the arterial branches of the porta, which serve for the secretion of the bile; and that they run in company by the sides of the former, throughout all the substance of the liver; and even seem in many places to join, or open one into the other by anastomoses; for, in a dexterous injection of the vena portarum, I have known the wax return through the hepatic arteries; and therefore here, as well as in the lungs, a twofold inflammation may take place; but it is  
worth



worth remarking, that the effects of an inflammation in the liver, from a stuffing up of the portal branches, or of the extremities of the hepatic arteries, will be very different from the same effects in the lungs, from an inflammation of the extremities of the pulmonary or bronchial arteries of the lungs; for in the lungs, in both cases, the very considerable force of the heart, which is contiguous, presses upon the inflamed parts; but in the liver the branches from the porta are filled with blood from the veins of the abdominal viscera, moving on much more slowly than the arterial blood which passes the hepatic arteries. On this account the effects which arise from the blood pressing upon an inflamed part, and which are, likewise, the plain indications of a present inflammation, do not so plainly shew themselves when the malady lies in the branches of the vena portarum; and this seems to be the reason why some physicians are often mistaken in their diagnosis of this distemper.



GALEN, and many physicians after him, have particularly distinguished the distemper, according as what certain part, or region of the liver, the inflammation is seated in, as whether it be in the convex or gibbous part, which lies next the diaphragm, or in its concave or hollow part, which covers a portion of the stomach and duodenum; but he will have the diagnostic signs to differ in these two cases, more especially because different parts are pressed and irritated by the inflammatory swelling of the liver; so that if the inflammation be seated in the convex part of the liver, he observes there will be a greater difficulty of breathing, a pain of the right side will reach up to the very neck, and a cough will also attend: but if the concave part of the liver be inflamed, he then tells us, that a sickness, reaching, vomiting, and great thirst, will be most observable.

The omentum has no excretory vessel; and therefore all the fat, liquified and  
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transfused by disease or violent exercise, must pass directly through the epiploic veins into the vena portarum; whereby the whole liver will be suddenly surcharged with an inundation of oily fat, which will not very readily move thro' the very straight passages of the small vessels, and will give rise to an obstruction of the worst kind, more especially in this inert viscus, which is first attacked by the said oily plethora.

Stony concretions are no where oftener found than in the liver and gall bladder, and in the passages destined for the separation, retention, and expulsion of the urine.

NEBELIUS, in the body of a soldier, found a long worm, both in the cystic and in the hepatic duct, with a number of the same sort in the intestines; whence he reasonably conjectured, that those worms had made their way from the duodenum, through the common biliary duct, into the cystic and



hepatic duct. There may, perhaps, be other passages by which worms may get into the liver; for RUYSCH, in examining the mesentery of a horse, found a part of the mesenteric artery greatly dilated, which, upon examination, was owing to numberless small worms about the size of very fine needles: neither is it absurd to believe that such vermiculi, when they were infinitely smaller, might have passed along from the mesenteric arteries to the veins of the same name, and so get, by that means, into the liver.

It is well known that the fore part of the liver, which lies upon the stomach, is in immediate contact with the peritonæum, and is therefore very easily affected by the external cold; and hence we may frequently account for inflammations of the liver, and very stubborn jaundices.

Violent thirst may occasion terrible disorders throughout the whole body, but more especially in the liver, because the blood in that viscus is obliged to flow from the  
veins,



veins, thro' the straightened arteries, without receiving any additional force from the heart and lungs.

If now the whole tract of the stomach and intestines, being overparched for want of drink, there be none of the usual moisture re-absorbed into the meseraical small veins, the venal blood of the abdominal viscera will return too thick, before it is driven by the vena portarum through the liver, in the extremities of whose minuter vessels, it will be, therefore, apt to stick and adhere; but the other venal blood, before it enters the right side of the heart, is first diluted, with all the lymph collected throughout the cellular substance of the whole body, and is then attenuated by passing the pulmonary artery with a very considerable muscular force from the heart: but as both these helps are wanting, towards facilitating the course of the blood thro' the liver, it readily appears, that we have much reason to fear obstructions in this gland, from the impervious blood



adhering closely to the impacted vessels.

When the bile cannot pass through the intestines, but returns from the liver into the blood, and overspreads the whole surface of the body, it occasions the jaundice.—But since the hepatic bile differs in colour from that of the cystic, and both of them often put on a different colour from that which is natural to them, it will necessarily follow, that icteritious people will be variously tinged; sometimes they are pallid, or of a yellowish green hue; at others of a deep green, inclining almost to black; yet physicians have generally distinguished but two kinds of the jaundice, namely, the black and the yellow; although there be, in fact, a great diversity, or number of colours, betwixt the slightest yellow jaundice, and that which descends almost to a black.

A doubt, however, may arise, Whether an inflammation of the liver can produce a jaundice? Unerring observation proves that  
every



every impediment which obstructs the free discharge of the bile from the liver and gall bladder into the duodenum, may produce a jaundice. Thus, for example, a jaundice has often been observed in newborn infants, from the glutinous clogging humours collected in, and sticking to the sides of the intestines; but that kind of jaundice is easily cured by expelling the congested humours by a slight purge. Some women have been observed to have a jaundice during the time of their pregnancy, although they were not troubled with that distemper either before or after their child-bearing; this might possibly happen by the enlargement of the womb compressing the abdominal viscera, and displacing the intestines, after a wonderful manner, from their usual situations; they have sometimes voided most hard fæces, of a very considerable bulk, by stool, for some days after delivery; after which the yellow icteritious colour has entirely disappeared: whence it is very probable to suppose the colour to have been



distended by such accumulated faeces in that part, where it lies under the liver, so as to compress the cystic duct. If, therefore, an inflammatory tumour of the liver happen in a place, so as to compress the exit of the cystic bile, no doubt such an hepatitis, or inflammation of the liver, may produce a jaundice. But it is not quite so clear that every hepatitis may be the cause of a jaundice; namely, inasmuch as it impedes the secretion of the bile, by the stuffed-up extremities of the vena portarum; or if the adjacent secretory ducts are compressed by the same distended and inflamed vessels that lie contiguous to the ducts, which contain the bile, already separated from the blood of the vena portarum. Certain we are, that the cystic bile differs, both in colour and taste, from the hepatic; and there are numberless arteries ramified throughout the gall bladder with wonderful contrivance, and in very peculiar distributions, as we are taught by anatomical injections: whence it seems not improbable, that they



they may be some way serviceable towards the preparation and secretion of this bitter fluid. Add to this, that naturally in the liver we observe, neither bitterness nor a yellow colour; and therefore, when a jaundice tinges the surface of the body with such a colour, it seems to follow, that it must be from an obstruction of the excretion of the cystic bile into the duodenum, whence it is driven back again into the blood. This opinion is confirmed by observations made in deceased bodies; abscesses, even of a considerable bulk, have been found in the liver, without any preceding jaundice; and other tumours have been found, likewise, which, by their bulk, must have compressed a great many of the adjacent biliary ducts and vessels: on the other hand, when the bodies of those deceased of a jaundice have been opened, the causes have manifestly appeared, and been found such as obstructed the discharge of the cystic bile into the duodenum; and,



and, among these, the most frequent causes have been stony concretions blocking up the excretory passages of the bile.

But, in the mean time, it deserves to be remarked, that the blood of the vena portarum contains in itself the matter for the immediate formation of the bile, which must be soon after separated from thence by the secretory ducts of the liver; so that, if a large part of the final extremities of the vena portarum are stuffed with impervious humours, the secretion of the hepatic bile will be necessarily obstructed; and that as yet unperfected bilious juice, which was about to assume the name of bile, will remain mixed with the blood, and pass with it throughout the body: consequently, this must induce a bilious cacochymia of the blood, which thus retains a humour accumulated in itself, that ought not naturally to be there, or at least not in that abundance. When continual, or remitting fevers, have been  
epide-



epidemical in the autumn season, after very hot and dry summers, practical observations have then shewn us, that the liver has been often affected, and stuffed with a thick blood, that has had almost an atrabiliary tenacity: now in such patients there has not, indeed, been observed the intense yellowness of a jaundice, but the face looks of a fallow complexion, exhibiting a paleness, mixed with a small tincture of light yellow, as a symptom of this distemper.

So long as the febrile heat continues moderate, and is treated with resolvent medicines, the obstructions formed in the liver may be removed, so as to restore the patient to perfect health; but if, when the distemper is going off, the tired patient refuses farther help, or if the physician carelessly neglects to treat the remains of the distemper timely, chronic disorders are then usually the consequence, which prove extremely difficult to cure, particularly scirrhus indurations of the liver. In autumnal epidemical fevers,



fevers, which follow after the hottest summers, it often happens that a slight inflammation of the liver is an attendant with other symptoms; and when such a fever is removed or extinguished, before the febrile viscid that lodged within the obstructed vessels of the liver be thoroughly resolved, the surviving patient often lives in an unhealthy, or languishing state, with a pale, yellowish, or fallow countenance, and is not without the utmost difficulty recoverable to sound health; at least, it will be a work infinitely more laborious, or difficult, to remove obstructions in the liver that are once confirmed and inveterate, when they might have been easily removed in the beginning of the distemper. But this difficulty here principally arises, because the blood of the *vena portarum*, now become venal, moves with a less force, wanting, in a great measure, the impulse of the heart and arteries to push the blood forward through the other parts.



parts. Hence HIPPOCRATES, who describes an hepatitis, but by a different apellation, very justly remarks, that many who have had this distemper only palliated, or imperfectly cured, have afterwards had a return of the same malady; and that then they are in great danger of a consumption: and he afterwards adds, that for forty-five days after the violence of the distemper is over, the patient ought to be kept to the lightest regimen, and make milk whey his daily drink, provided the season of the year will permit; because the disease is stubborn, and requires a careful treatment. When no further yellowness is observable in the eyes, while the pale, yellow, or fallow colour goes off from the face, and the urine, with the intestinal fæces, recover their natural appearance, while at the same time no pain or anxiety is felt about the right hypochondrium, especially after a full stomach, or after more than usual exercise of the body,



body, we may then pronounce the cure to be compleat; and more especially, when for several weeks after there are no returns of these symptoms or complaints: for great care is here necessary, not to leave any remains of the distemper within the liver, since most chronical distempers take their rise from an inflammation of that viscus, either neglected or ill cured.

The principal diagnostic signs, by which a tumour of the gall bladder may be distinguished from an abscess of the liver, are, that a throbbing pain attends suppuration, together with wandering shiverings, which are both frequent and hold for some time; that the tumour of an abscess has not so uniform or circumscribed a figure; nor is there at first such an apparent or easy fluctuation observable in it, which is most sensibly to be perceived in the center of the tumour only, the circumference still remaining hard. But it is obvious enough, that the difficulty  
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of distinguishing these tumours, is only when they occupy that region of the liver wherein the gall bladder is placed.

The bad symptoms which attend the liver, wasting by a purulent imposthume, proceed partly from the re-forbed matter bringing on a purulent cacochymia of the blood; and partly because the functions which depend upon a healthy state of this important viscus are interrupted: for the quantity of collected matter increases daily, whence it has been found amounting in the liver to an incredible quantity: and thus, by drawing and compressing the adjacent organs, that lie contiguous to the liver, it may be productive of many evils. ARETÆUS, for this reason, among the other symptoms which attend a suppuration of the liver, mentions a sharp pain extending as high as the throat and top of the shoulder, because the diaphragm with the pleura connected to it, are hereby much distracted.

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An inflammation of the liver is often attended with great anguish and oppression; and as all the functions of the several viscera in the abdomen must either be impeded or much disturbed, the free course of the blood through the portal veins of the liver, being obstructed, a great weakness of the vital powers from the corrupted bile that in this case often lodges itself about the præcordia or stomach, will happen; which has led some unskilful people to treat such an inflammatory hepatitis as a malignant fever, with great danger to the patient; but a diligent observation of the causes of an hepatitis, and of its effects, will not easily lead the wary physician into such mistakes.

The bile is known to be one of the sharpest and most putrescent juices of the body; the blood of the *venæ portarum* contains the immediate matter of this soapy fluid; but the property of the bile is to melt or dissolve the texture of the blood,



texture, insomuch that after a long continued jaundice, the blood too much fused by the intermixed bile, commonly terminates in an incurable and fatal dropsey.

Whatever juices flow through the vena portarum, do it by a two-fold passage, either through the secretory canals into the hepatic pores and ducts, or else through the final extremities of the vena portarum into the branches of the vena cava, which are distributed through the whole substance of the liver, and thence into the cava, sinus venosus, and right auricle of the heart. But since the hepatic bile, secreted from the blood of the vena portarum, is a fluid much thinner than the blood itself, it will therefore evidently follow, that if its course through the bilious canals be obstructed, that the said bilious juice will return with the blood through the vena cava, so as to infect the whole mass of circulating fluids with a bilious cacochymia. 'Tis true, indeed, these bilious canals, that convey away the bile as it drains or secretes from the blood of the vena portarum, are not very easily

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obstructed, but from a violent cause, since the fluid has a motion through them, from a less to a more largely opening part of the vessel; but then it meets with a much smaller passage through the entrance of the common duct into the duodenum, where obstructions often prevent its exclusion. Again, the bile, and even the blood, containing the immediate matter which constitutes the bile, are very much inclined to run into calculous concretions, which being once formed, and daily enlarged, may easily block up those passages. Finally, all sorts of tumours seated in the liver, whether they be inflammatory, suppurative, scirrhus, steatomatous, &c. may produce such an obstruction by compressing the adjacent parts which lie contiguous.

Young people are seldom attacked with this disorder, which oftener invades people more advanced in years, or those inclining to old age, and more especially persons who have long laboured under afflictions and grief, or are of a fretful and choleric  
hasty



hasty disposition ; but above all, it attacks those who lead very sedentary lives, who live sumptuously, feed high, and who, after having filled their stomachs, indulge themselves at table, where, by sitting too long, all the abdominal viscera become compressed. They first begin to complain of a troublesome tightness about the præcordia, with a sensation like that of an oppressing load ; for some hours after eating they complain of a sharp heart-burn, or pain about the cardia, which has been known to hold the patient several months before a periodical jaundice of this kind. The next observable symptom is a slight yellowness in the greater canthi of the eyes, the urine becomes somewhat higher coloured, and bilious excrements pass by stool ; afterwards a sudden and unaccountable anxiety arises, without any apparent previous cause, with an intolerable pain about the cardia, and sometimes even throughout the whole abdomen ; whence it is often



taken for a pain of the cholic or iliac passion; and lastly, a fever succeeds, with violent vomiting, and when these symptoms have continued for some hours, they abate or go off, and leave the whole body tinged with this icteritious colour. In some the face and breast only have been coloured with this yellow tint at the first attack, without affecting any of the other parts of the body, but then the urine is of a very deep yellow, and the patient has no other material complaint; yet some have a troublesome pain in their back, loins, and sides, before the yellowness appears: HIPPOCRATES has taken notice of this, *Quibus lumborum ac lateris dolor sine manifesta causa, icterici fiunt.* “Those who have a pain of the  
“loins and sides, without a manifest  
“cause, become icterical.” After twenty-four hours, sooner or later, these patients find themselves seemingly well, and perceiving no more of this oppressive weight about the præcordia, flatter themselves they shall soon get perfectly well;  
their



their urine becomes less and less coloured, the yellowness goes off daily, so that in a few days there seems to be nothing of the distemper left. In some there is an intolerable itching in the skin, all the time it is tinged with the bile.—But in a few weeks, and sometimes a few months, the whole train of these complaints return again in the same order; and after the patient has been attacked thus for several times, the jaundice at length becomes perpetual, worse at some times than others, though not attended with such violent symptoms as at their first attack; the yellow colour is now very intense, and diffused all over the body, even the saliva itself, (this, however, is rarely observed) has a bitter taste; in process of time the whole body becomes of an almost black colour, the legs and ancles begin to swell, and the abdomen at length filling with water, sinks the miserable patient under a dropsy.

A jaundice happening in acute fevers, before the seventh day, is always suspi-

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cious, because it rather denotes an increase of the malady, and that the vessels of the liver, which have hitherto remained pervious, are now beginning to be stuffed up and obstructed by the yet unconcocted matter.

Bleeding is, in general, proper in the cure of an inflammation for three reasons, namely, 1st. To prevent any further injury of the vessels which are inflamed, by lessening the quantity and impetus of the blood in the obstructed vessels: 2d. That the vessels, distended with impervious matter, may be restored to their proper vibrations, by lessening the fluid that oppresses their muscular and elastic force: or, lastly, That the obstructing matters having a less impulse of fluids urging from behind, may be repelled into a larger part of the vessel, and the obstruction be thereby removed. Now, it readily appears, that all these effects of blood-letting will be much less efficacious towards the cure of an inflammation of the liver, since the  
blood



blood of the portal veins is already venal, before it is driven into the narrow passages of the converging branches, whence it follows, that the impressed force of the heart and arteries on this blood must be extremely weak; but when an inflammation is seated in the final extremities of the hepatic artery, bleeding will then have a more considerable effect, no less here than in any other part of the body. We are not, therefore, totally to discourage bleeding in this case; for it may reduce the too great violence of the fever, diminish the heat, relax and empty the vessels, and allow a more easy entrance or admission of diluents and attenuants.

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*Of an Inflammation of the Stomach and Intestines.*

**I**T is almost a pathognomic sign of an inflammation of the cardia, when the pain is violently exasperated, after any  
Y 4 thing,



thing, tho' ever so small in quantity, has been taken down into the stomach, which it at other times would have easily borne. Indeed, if the inflammation be seated in the parts contiguous to the stomach, it will be irritated by its distension, but then the sudden exasperation of pain will not be so immediately perceived if but a small quantity be swallowed down. It is observable that an inflammation of the stomach often kills the patient very suddenly, by exciting the most violent convulsions.

If a scirrhus of these parts be recent, a course of Venice soap, used for a considerable time, has been found serviceable, provided the patient takes to the amount of two drachms every day for several months; for this is the highest resolvent, and is at the same time tolerably mild; but it should be laid aside immediately, in case the pains or vomitings increase upon taking it; for we then have reason to suspect the scirrhus is degenerated into the nature of a cancer, which will not admit



admit of this medicine; and here the medicinal spaw waters, which have no acrimony, and abound with an extraordinary power to resolve concretions or indurations in the human body, will be very properly prescribed.

Distempers of the spleen are very frequently mentioned by the ancients, but with such circumstances as afford good reasons to suspect they have sometimes mistaken the distempers of other parts, for this; for the left flexure of the colon lies immediately contiguous and under the spleen, from whence indurated fæces and flatulencies obstructed by these fæces, may cause pains and swellings in the region of the spleen, though there may be no fault in the spleen itself.—Moreover, if we consider that the ancients often mention scirrhoties of the spleen very speedily cured, and that even some of the moderns do the same, there will be little room to doubt, but that those hard swellings arose from indurated fæces, lodged at  
the



the flexure of the colon ; since a scirrhus cannot be so suddenly resolved, but for the most part even stubbornly withstands the most powerful medicines.

The smaller intestines are oftener inflamed than the larger. The frequent cause of inflammation in the bowels, is the acrimony of such humours as are lodged in the cavity of the intestines ; and such an acrimony must be derived either from what is swallowed into the stomach, or from a matter formed in other viscera, and thence translated into the bowels. It will, perhaps, seem difficult to understand how the contents of the large intestines can be able to pass into the small intestine ileum ; and likewise to account how they should get over the place where the volvulus is seated ; but if it be considered, that by this inverted peristaltic motion, the ileum itself is emptied, while the cæcum is greatly pressed and its sides distended, such a passage will easily seem possible ; for if the volvulus be formed by an intorsuf-  
ception



ception of a lower portion of the gut into the upper, the way will not be so wholly intercepted for any thing to pass upward by the reverted motion. But if the gut be in this manner involuted downwards, so that the lower portion being more dilated takes in the upper, such a return will, in that case, be certainly much more difficult; but then we are also to observe, that this stercoraceous vomiting only happens (at least for the most part) when the patient is in the last extremity of the disease, namely, when a gangrene is already formed, or very near at hand: and, it is well known, that, whatever tension the parts may suffer under a state of painful inflammation, they, notwithstanding, relax and subside when the phlegmon turns to a gangrene.

If the seat of inflammation be in the larger guts, the most emollient fomentations may be applied immediately to the inflamed parts, where they will relax the stuffed-up vessels, and dilute  
what



what is impervious ; but where the small guts are inflamed, it is true, that clysters cannot naturally penetrate so far as to reach the part itself, yet the large intestines being filled with such liquors, will prove as a warm bath to all the adjacent parts, and by that means be of great use ; and nothing is of greater service in relieving cramped or convulsed parts, as the application of warm and emollient remedies.

A prudent use of opiates may be of great relief, since we know not a more powerful antispasmodick than opium, but bleeding and the use of clysters must be premised, to abate the inflammation ; otherwise, while the pain is rendered insensible by opiates, the causes of the pain, to wit, the inflammation, may yet remain, and destroy the affected parts by gangrene.

If an acid acrimony excites this distemper, absorbents will be proper ; but, on the contrary, if it arises from any putrid matter, such things as are acid, or acescent,



acescent, will afford the best relief, more especially when plentifully diluted with water. In other cases, where the nature of the acrimony is doubtful or unknown, or where the excoriated membranes can only bear the softest liquors, watery, oily, mucilaginous, and emollient decoctions, will be always the best adapted.

Inflammations of the bowels must most certainly be treated in the antiphlogistic method by venæsection, fomentations, and emollient clysters.

If a fixed pain continues very severe in one certain place, with a violent fever and stubborn constipation of the bowels, while every thing taken into the body is returned by vomiting, or if the cure was neglected in the beginning of the disease, or no relief obtained from it, we may conclude that such a phlegmon of the bowels inclines to a gangrene.

A cadaverous countenance, livid lips, of a leaden colour, coldness of the extremities with anxiety, an inflated belly,  
an



an extreme weak and quick pulse, are certain signs of immediate death.

BAGLIVI observes, *Gravi iliaco si superveniat alvi fluxus, paucis post horis morietur nam sphacelata sunt omnia, hinc lethalis fluxus. Et si iliaco tumor ventris veniat, & flatus copiosi pedendo exeant, brevi morietur.* “If a flux of the bowels comes upon a violent iliac passion, the patient will die in a few hours after; for all the parts of the intestine are then mortified, from whence proceeds the fatal flux. And when a tight distention and tumour of the belly attends an iliac passion, with a plentiful eruption of flatus downward, the case is also desperate and fatal.”

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Of Aphthæ.

PHYSIOLOGY demonstrates that a great quantity of the juices are discharged through the whole internal surface of the mouth, in order to be mixed with the aliments at our meals in mastication; and



and at the same time that there are numberless mucous cryptæ, or cells in the back of the tongue, tonsils, velum of the palate, pharynx and gula, which excrete a thick mucus for the lubrication of these parts. If we look into the mouth of a healthy person, we behold all those parts equally moist and tumid: whence we may justly conclude, that there are like emissaries every where which transmit the same mucous liquid this; is also perfectly confirmed by anatomical injections. Now those eruptive aphthæ arise when the said mucous humour, being rendered thicker than ordinary, cannot be driven forward through the ultimate extremities of the said emissary ducts, but adheres there, and blocks up the excretory openings into the mouth: while the force of the humour, urging from behind, distends the ends of the vessels above the surface, and thus produces the aphthæ. A diligent inspection of the aphthæ, at their first appearance, when they are here  
and



and there singly dispersed, seems to confirm this opinion; for when they occupy these parts in thick clusters, they are not easily distinguished to be composed of single ones. But this appears still more evidently when the apthous crust falls off, and is again renewed, as is frequently observed to happen: for then by wiping or scraping the internal parts of the mouth, there appears small white specks, more especially if they are viewed through a magnifying glass; these again suddenly encreasing, unite, as they lie contiguous, and within a few hours form a like apthous crust, resembling that which separated and fell off a little before. Hence it is evident that apthæ cannot, without an impropriety, be termed exulcerations.

This distemper is very rarely, or seldom ever observed in hot countries: for human bodies being more thin and lax in the warmer climates, become better disposed to perspire and sweat, so as frequently to carry off the matter of this and  
other



other distempers by exhalation or sweat, which, in bodies less apt to sweat, and in colder climates, does not so easily escape from the habit: and KETELAER affirms, that he has observed such copious sweats and urines to have rendered the aphthæ more safe and mild, whereas every thing that tended to lessen these evacuations always proved detrimental. It may, perhaps, deserve to be remarked, that in those countries where the aphthæ do not appear, that the white and red miliary eruptions are frequently to be observed on the outward surface of the skin. It may be then asked, Whether a like humour is not here deposited upon the outward skin, as that which in the case of aphthæ is dispersed through the surface of the various parts of the first passages? Certain we are, that these miliary eruptions often attend in most kinds of acute distempers and continual fevers, and there is also a very peculiar and disagreeable smell, commonly resembling that of flat or vapid vinegar,

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perceivable in the apartment where the patient lies; and this smell is also frequently to be observed in apthous patients. The white miliary eruptions exhibit very small pustules filled with a pellucid liquor, in part projecting above the surface of the cuticle; and after the said liquid is become turbid and opaque, they dry up, scale off, and are often renewed. Now in the apthæ many like circumstances happen, and are also preceded by anxiety about the præcordia, weakness, slight and perpetual dozing of unequal intervals, in the same manner as we often observe it to happen before miliary eruptions, and the decline of them after their eruption. Sometimes the miliary eruptions disappear very suddenly, with great danger to the patient: we likewise observe the apthæ to vanish within a few hours; upon which the fever returns, or rages with great violence, and a troublesome oppression is felt at the præcordia, from whence there seldom can be expected any relief but by  
throw-



throwing out the aphthæ again, if possible.—But these particulars are only proposed as merely speculative, that those who have frequent opportunities of seeing both the aphthæ and the miliary eruptions, may judge concerning the affinity of these two separations of the morbid matter, deposited upon the different parts of the body; for it must be confessed, that there are several other symptoms which precede and accompany the miliary eruption, which are yet not to be observed in the aphthæ.

A stupor and heaviness are certain signs of approaching aphthæ, which seldom or ever fail; so that even the nurse or attendants on the sick, where these eruptions have often been known, immediately presage their appearance when they observe these symptoms.

Hicups too have been often observed to precede a thrush in the mouth, which seems to be owing to the apthous crust, which is forming about the upper orifice of the stomach, where it is the cause of irritation by its bulk.



If we consider that the opening of the common duct of the bile and pancreatic juice into the duodenum, may be so obstructed by a thick aphthous crust, as to transmit neither of those important fluids, we may easily apprehend what great anxieties must follow about the præcordia. But when the said impeding crust is once separated, and a free passage opened for the discharge of the now accumulated bile, rendered more acrid by stagnating, we need not wonder if the worst severe gripes arise in the bowels, that are, in a manner, almost excoriated, so as to produce most dangerous diarrhæas and dysenteries: hence it is that many physicians have so much condemned the use of purgatives in the aphthæ, because they have observed them sometimes fatal within a few hours, by causing an over-purging, or hypercatharsis, which seems to have been in consequence, not only of the purgatives, but also of the sudden torrent of collected bile and pancreatic juice, rushing suddenly forth into the bowels,



bowels, and irritating their raw or ex-coriated surface. Moreover, as a salivation often holds for several days after the thrush is fallen from the mouth, before the dilated vessels can recover their former size; so, upon the same account, the juices which naturally distil into the stomach and intestines, frequently continue to flow in such great abundance, as to entirely exhaust the body by the purgings.

*Aphthæ* of the mouth in pregnant women may cause abortion, because they hinder the due preparation of the aliments, and absorption of the chyle; and, therefore, as the pregnant mother requires nourishment to sustain two bodies at the same time, the want of chyle will be soon destructive to the fœtus, more especially as it must have suffered considerably already, from the mother's humours being vitiated by the preceding distemper, changed much from the healthy state they ought naturally to have.

A hickup in the beginning of a thrush is of worse consequence than at their



falling off, because it denotes the interior surface of the stomach to be lined with very thick aphthæ, which, gradually ascending from thence into the gula, at length fill the whole extent of the fauces, and are of the worst disposition, and become commonly fatal.

Cold applications in this disorder are very dangerous.

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*Of a Nephritis.*

**A** Nephritis is an inflammation of the kidneys with intense pain.

Little urine, thin and aqueous, is justly condemned as bad, both as a sign in the distemper present, and as a cause in the future changes. As a symptom, because it denotes a very violent degree of inflammation, and that throughout the whole substance of the kidney; and it is so, likewise, as a cause, inasmuch as all the acrid parts of the humours are now retained, which, by the laws of nature,



nature, ought to have been this way evacuated from the body, and instead of which, the thin parts of the blood, driven through the kidneys, being thus exhausted from the other parts, increases the inflammatory density of the blood.

It may be occasioned by violent straining; for as the kidneys are fastened to some of the strongest muscles of the back, at that time swelled with action, while the diaphragm and abdominal muscles, at the same time, powerfully compress the viscera; and if we consider, also, the bigness of the emulgent vessels, it will, from all these matters considered, appear evidently, what a force the kidneys sustain in a violent exertion of one's utmost strength; more especially when the body, being bent forward, endeavours to raise itself upright with some large weight, in which case the muscles of the back act with a prodigious force. Violent straining, therefore, of the body, may be a



cause productive of an inflammation of the kidneys, by compressing and obstructing the final extremities of their arteries, and likewise by urging the gross red blood into the urinary tubes, which naturally transmit only pellucid juices that are much thinner.

It may be occasioned by heat; for by heated air the most fluid part of our humours are dissipated, and the blood becoming more dense, is also of a redder colour and more acrid, which brings on a stranguary.

An iliac passion, and that of a fatal tendency, has followed upon symptoms which have indicated the disease in the bladder or kidneys. This has been confirmed by HIPPOCRATES, *Quibus ex stranguria volvulus succedit, intra septem dies intereunt, nisi oborta febre copiosa urina effluat.* "A stranguary succeeded by an iliac passion, is fatal about the seventh day, unless a fever comes on with a copious discharge of urine." GALEN seems to have a doubt about this; but I have



have once met with it, though it must be confessed that the case is very rare and uncommon.

In an inflammatory nephritis, such urine as appears thick, although it does not subside, or form a distinct and even hypostasis, is, nevertheless, good, which yet, in other diseases, is a sign to be suspected. But the reason of this difference is, that in other acute distempers, the matter of the disease being dissolved and rendered fluxile, must remix with the blood, pass the lungs, and circulate with the blood through the arteries before it can escape through the kidneys; nor can it all pass out presently by this emunctory, but is obliged to suffer the repeated actions of the lungs and arteries, which, in a manner, divide, and, as it were, levigate its parts, that are thus adapted to form a copious and even sediment in the urine. But the matter of the distemper lodged in the kidneys has no such necessity of remixing with the blood, but may immediately, upon its colliquation or dissolution, descend and escape with the urine.

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The sharper diuretics are here mischievous ; for by their stimulus they increase the fever and present inflammation, and give a greater acrimony to the urine, by which all the painful parts are more irritated, and the symptoms aggravated. Lenients with watery drinks, emollient and soft oily medicines are best, for they ease pain, relax the parts that are drawn into a cramp or constriction, and lubricate the passages to the bladder.

Pus discharged with the urine, if considered alone, is no absolute sign of an abscess or ulcer in the kidney ; since it may come from the ureters or bladder, affected in the same manner. TRALLIAN has very well observed the signs by which one may distinguish, whether the pus comes from the kidneys or from other parts : for if the matter was not collected in the urinary passages, but being first absorbed elsewhere, passes off with the urine, this pus will appear most intimately mixed with the urine, and will subside, but very slowly to the bottom of



of the vessel; because this pus being intermixed with the blood, has been highly attenuated by the action of the lungs and arteries, and has passed thence with the secreted urine through the venal ducts. But when matter distils immediately from an ulcer of the kidneys, it is never thus intimately blended with the urine; but, soon after it is discharged, appears at the bottom of the vessel, separated from the urine.—Matter from the bladder is much more tenacious and glutinous, and directly subsides like slime to the bottom of the urinal; but matter from the kidneys appears more loose and fluctuating.

It seems a doubtful point, whether a complete palsy may ensue in the leg and thigh of the same side, from a tumour in the kidneys.—Since the large nervous trunks that are sent to those limbs, go out from the foramina of the *os sacrum*, and are so situated, as scarcely to be compressed by any swelling of the kidneys, however large it may be. Add to this, that in an abscess of the bladder there is

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discharged with the urine a sort of scabby or foliaceous fragments, which TRALLIAN calls *κορια πέταλωδη*, a leaf-like abrasion, which is, probably, a separation of the interior lining of the bladder; but from a suppuration in the kidneys, particles more consistent and fleshy are discharged in the urine, which are, by HIPPOCRATES, called *σάρκια σμίκρα*, small carnuces, and he tells us they come from the kidneys: but these are, probably, half gangrenous parts, from the substance of the kidneys themselves; for in the same manner we see that upon the breaking of abscesses in the external parts of the body, there are membranous fleeces of the cellular substance intermixed with the discharged matter.

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Of an Apoplexy.

THE longer the neck is, the greater is the distance of the heart from the basis of the skull; but as the motion



tion communicated to the blood, by the contraction of the heart, and dilatations of the arteries, occasioned by the blood which is propelled through them, are stronger near the heart than in parts more remote from it; it is thence very plain, that the nearer the heart is situated to the head, the blood will, *cæteris paribus*, be pushed with the greater force through the vessels of the brain; whence, likewise, these vessels will be the more distended, especially as the blood is sent to the head in a straight course through pretty large arteries. Hence it is remarked in physiology, that the carotid and vertebral arteries, when they approach the basis of the brain, are disposed in such a manner, as that the force of the blood which is propelled through them, may be diminished, lest the soft substance of the brain should be hurt by its violence: whence it appears why a short neck is justly reckoned a predisponent cause of an apoplexy.

In persons who are very corpulent, all the vessels of the body are compressed  
by



by the accumulated fat ; and there is no fat observed within the skull, or at least very rarely, and a very small quantity about the sinusses of the dura mater ; it appears very plain, that thereby the larger vessels of the brain must be filled and dilated, and the smaller ones compressed, whereby its functions will be gradually more and more obstructed ; hence they begin to grow dull, torpid, forgetful, and sleepy ; all the senses are rendered less acute in them ; and at last the brain being oppressed with too great a fullness, or a rupture of the vessels, they die apoplectic.

Plethoric persons become sleepy, torpid, and subject to swimmings of the head, and unless that plenitude of blood be diminished, either by natural or artificial evacuations, they will be in danger of becoming apoplectic ; and the reason seems to be this, the red blood, naturally, is not found in the vessels of the brain, but in those of the pia mater, and in all its processes, which insinuate them-



themselves every where between the cortex and medullary substance of the brain; as, therefore, all the blood vessels in plethoric persons are turgid with too much blood, these vessels, likewise, will be distended, but the cavity of the skull is very exactly filled up by the contained brain, and the bones of the cranium cannot yield in adults; wherefore the blood vessels being more full than usual, the other vessels which contain the thinner fluids must be straightened and compressed, and therefore the functions of the brain disturbed.

The too great thickness of the humours may be reduced to three species, viz. to *polypose concretions*, an *inflammatory spissitude*, and a *phlegmatic lentor*.

The immediate cause is the same in all apoplexies, but the remote ones are frequently very different; whence there can be no universal method of curing this disease: for if the animal functions are abolished by an inert phlegmatic  
lentor



lensor of the blood, whereby it is rendered unfit to circulate freely through the vessels of the brain, and serve for the secretion of the spirits, then that method of cure alone is proper which attenuates this lensor, gives a due consistence to the blood, and quickens its too languid motion; but if the blood, from an inflammatory spissitude, is obstructed near the extremities of the vessels, then a quite opposite method of cure, whereby the blood may be dissolved, and the too great motion of humours moderated, will undoubtedly be necessary.

A flux may be of service in an apoplexy two ways, either as it evacuates part of the morbifick matter, or as it diverts the force and quantity of the humours from the head downwards; for as by the humours being evacuated by stool, the vessels of the abdominal viscera are emptied, and thus make less resistance to the blood, which is sent thither; hence a powerful revulsion is made from the upper parts of the body. In the  
vertigo



vertigo the whole common sensory is affected; but then especially a vertigo threatens an apoplexy, when the cause of the former is lodged within the cranium, and then the vertigo is called idiopathic. This is known from the constitution of the patient, and other concomitant symptoms; there is likewise a sympathetic vertigo, in which the common sensory is indeed affected, but the cause of the vertigo remains without the cranium; as for example, bile corrupted in the stomach, poisons swallowed down, &c. but this species of vertigo rarely ends in an apoplexy.

Evacuations are then only useful in diseases, when they either remove the morbid matter, diminish the too great quantity of good blood in plethoric persons, check the too great rapidity of the circulation, or lastly, divert the force of the circulating humours from the parts affected, to other parts of the body; it easily appears that there cannot much good be expected from bleeding in apoplexies arising from a phlegmatic tumour.

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There is need of great judgment in the cure of a cacochymia, where the symptoms shew the functions of the brain to be disturbed: for if you suddenly disturb the humours before they are sufficiently attenuated, they will stick so much the more obstinately in the extremities of the vessels, and all the complaints will be increased. This is the reason why determining remedies ought first to be applied, that the pressure may be diverted from the head as much as possible, and at the same time a part of the viscid phlegm may be removed by evacuants; then we must begin with gentle dissolvents, and especially with those which powerfully resolve, and at the same time do not increase the force of the circulation suddenly and violently; such as Venice soap, tartarized tartar, regenerated tartar, fixed alkaline salts, of the ashes of plants, &c. After these have been some time used, if the symptoms become easier, we may know the lentor to be attenuated; then more acrid



dissolvents, and such as increase the motion of the humours may be safely used, together with corroborants which correct the too great laxity of the solids, a constant attendant of this kind of cacochymia. Blisters are here of the greatest service, not only as by stimulating and irritating the part to which they are applied they make a revulsion towards other parts of the body, but likewise by separating the cuticle from the skin, they draw a great collection of lymph under the epidermis, which, upon the blisters being cut, continues frequently to discharge several days; at the same time they increase the motion of the blood, through the whole body, dissolve and attenuate the lentor of the fluids.

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*Of Chronical Diseases.*

CHRONICAL diseases in strong labouring people generally arise from complaints remaining after acute distempers,



which have not been perfectly cured: but in weak and indolent persons, they are owing to a morbid quality of the fluids, gradually arising from the aliments not being duly assimilated.

Austere substances act first, and most efficaciously upon the stomach and intestines, and by constringing the mouth of the absorbent veins, seem to preclude their passage into the vessels, so that they cannot easily infect the blood; now from this effect alone great mischief may be produced, since by that means the minute vessels of the internal coat of the stomach and intestines are so contracted, as that the arteries cannot discharge, nor the veins absorb the fluids as usual, and the whole chylification will be thereby disturbed: but when those austere substances are much diluted, either by drink, or by the fluids which are conveyed to the intestines, they then enter the lacteal vessels, and occasion the worst kind of obstructions in the glands of the mesentery; or they may likewise be carried off  
from



from the mesenteric veins by the vena portarum to the liver, and there produce the like bad effects; hence chronical distempers of the abdominal viscera usually arise.

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*Of the Palsy.*

**A** Palsy is a lax immobility of a muscle; it differs from the tetanos, in which all the parts are rigid and immoveable, and is caused by an obstruction of the course of the nervous fluid from the brain to the affected muscles; and also by a suppression of whatever ought to be evacuated.

As the organs which secrete and excrete the saliva, receive their blood from branches of the external carotid artery, it is plain, that the excretion of the saliva being hindered, the branches of the internal carotid vessels must be more filled, and at the same time the blood which is to flow through the vessels of



the brain will not be freed of that viscid mucous matter, which is separated by the salivary ducts: wherefore all the functions of the brain might be disturbed, and a palsy be likewise produced from this cause only. This is the reason why we fear deliria, and a phrenitis coming on in acute diseases, where the patient's mouth is very dry.

The cause obstructing the function of a nerve, may either be seated in the coats only, or likewise in the substance of the nerve properly so called; whence a different prognosis will arise, because the cause of the palsy frequently, when seated in the teguments of the nerves, may be removed by art, but when it occupies the substance of the nerve itself, it is seldom or never cured.

The higher the palsy is seated in the body, the more dangerous, in general, it must be, as the cause of the disease is seated nearer to the brain.

A paraplegia has often happened, without any apparent cause existing with-

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in the cranium; but there, perhaps, was never an instance of an hemiplegia where the brain was not immediately affected, for the patient almost always stammers, loses his memory, &c. hence we have, likewise, reason to apprehend, that the cause of the hemiplegia increasing may bring on an apoplexy. But when a paraplegia or hemiplegia succeed upon an apoplexy, there is more hope, because we then have reason to believe that the cause of the disease is lessened, and that some parts of the brain are relieved from the obstruction.

It is a very bad symptom when the paralytic parts waste, for that denotes an insufficiency of nutritious liquor, which ought to supply the part affected.

A convulsive trembling of the paralytic part is good, both as a cause, and as a symptom; for it denotes, that the cause of muscular motion is again applied to the paralytic muscles, but not yet with such constancy, as that its effect can be durable, without soon giving



way a little. Whence it indicates a beginning cure, and gives great hopes of its being compleated; especially if attended with a gentle convulsion: for all the muscles which have been long at rest, if they happen to be hastily moved, are convulsed, as we see in those who are awakened out of sleep by a great noise, or the like, acting suddenly and powerfully upon the common sensory and nerves. But that convulsive trembling is of service, likewise, as a cause, seeing by those concussions, whatever remains obstructed in the muscles themselves, the extremities of the arteries, and perhaps in the very nerves, or at least in their coats, may frequently be resolved. Sometimes there is likewise felt a pricking sensation in the affected part, which is also a good omen: thus we frequently see, when a person sits sleeping inclined upon one hip, and compresses the great nervous trunk running along the back part of the thigh, with almost the whole weight of the body, the leg becomes numbed  
and



and immoveable; but upon changing the situation of the body, and so removing the compression, in a little time the disagreeable sensation is felt, as if innumerable small needles were pricking the part; soon after which the sense of motion and feeling returns: wherefore all those symptoms observed in a paralytic part, portend that a free motion is begun in the nerves through the arteries to the muscles; and that, therefore, there are great hopes of a perfect cure.

There are no hopes, or at least not very great, of curing a palsy, which has been of several years standing, because there is just cause to fear, that either the structure of the nerves is destroyed, or that their sides are so grown together, as no longer to transmit the animal spirits.

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*Of an Epilepsy.*

**I**F all the senses, both internal and external, are quite abolished, and at the same time the muscles are convulsed, independant of the influence of the will, it is a true epilepsy. Thus it is distinguished from a palsy, in which there is a flaccid immobility of the muscles; and likewise from a catalepsy, in which all the senses are indeed destroyed, but the body retains the same posture which it had at the first attack of the disease; and from an apoplexy, because in this, together with the cessation of the senses and voluntary motions, there is the appearance of a profound and constant sleep without convulsions. It is true, indeed, that apoplectic persons are sometimes convulsed a little before death, but in that case the epilepsy succeeds the apoplexy. The diagnostic signs, therefore, of an epilepsy, may be reduced to, 1. a cessation of the senses, 2. to a perturbation of the voluntary motions.

In



*Of an Epilepsy.*

In the worst species of all, they fall down immediately without any warning symptom, and experience teaches us, that this is almost always incurable. More frequently they at first feel a swimming in the head, perceive sparks before their eyes, and a purple or black colour or variegated like the rainbow; sometimes they hear strange kinds of sounds; others are sensible of a disagreeable smell, or a bad taste in the mouth. I have seen some who observed a small spark appear before their eyes, which was suddenly increased till it grew to the size of a large sun-beam. Others have imagined they saw all objects, as if they were involved in a cloud; and this darkness suddenly increasing, they fell down: *ARETÆUS* has remarked this, calling it *σκιος φαντασιν*, the appearance of a cloud. Some feel, as it were, a cold blast ascend from the finger or toe, or from some other part of the body, which, as soon as it arrives at the heart, they instantly fall: the patients recollect all those



those sensations as soon as they recover the paroxysm, but are ignorant of every thing that happens during the fit; whence afterwards, when they have suffered several paroxysms, they can foresee the fit a coming with those previous signs, and take care of themselves as much as they are able, or beg the assistance of the bye-standers. Most part of them the moment they fall, give a loud shriek, which they are, however, not conscious of: then follow, for the most part, various surprising convulsions of the muscular parts of the body. The respiration is most surprisingly disturbed; and this symptom seems to have made the ancients believe, that the epilepsy was nothing else than an effort of the brain to disburthen itself of something malignant, or an oppressing phlegm: but the respiration being hindered, the blood cannot be transmitted freely through the lungs, and therefore the right ventricle of the heart cannot evacuate itself; whence the venal blood is accumulated  
near



near that ventricle, and all the conspicuous veins appear very turgid, especially those of the forehead, the raninæ under the tongue, and the jugulars in the neck: then the face begins to grow livid, nay, almost black, first under the eyes about the lower eye-lid, where the skin is very lax, and likewise about the lips, almost in the same manner as in those who are strangled.

Young persons are more obnoxious to this disease than those who are grown up; for in the former, both the greater bulk and more tender structure of the brain, seem to constitute the predisponent causes, which, by means of any slight accidental cause supervening, produces the epilepsy.

Fear and sudden frights have, perhaps, occasioned this disorder more frequently than any other cause, and rendered it often incurable, nay and sometimes suddenly fatal.

I have several times seen a viscid foam tinged with blood, voided from the mouth



mouth and nose in the time of the paroxysm; and yet afterwards I could not observe the least appearance of a hurt in the tongue or other parts within the mouth, though I examined with the greatest care. If now the vena cava, passing through the liver, happens to be very full, and cannot empty itself into the right ventricle, then the vena portarum will not be able to transmit to it the blood remaining after the secretion of the bile; while in the mean time the convulsed abdominal muscles and diaphragm propel the venal blood towards the liver with such force; hence the mouths of the vessels opening into the cavity of the intestines, may be easily dilated so as to transude the blood itself, without any rupture of these vessels: in like manner also, the liver being thus distended, the blood returning from the spleen, by the *vasa brevia*, as they are called, may make its way into the cavity of the stomach; hence may be known the reason why blood may be sometimes voided



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voided upwards and downwards during the paroxysm, and even after it is over.

All the secretions and excretions may be much disturbed during the paroxysm of an epilepsy.

An epilepsy, when it takes its origin from the *hands or feet*, is easily cured, if from the *side* it is more difficult, but if from the *head* it is very bad and dangerous.

The only hope in attempting to cure this malady, consists in endeavouring to bring about a great change in the body. Removing the patients into a different air and climate.—It is often observed to go off at the time of puberty.

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*Of Melancholy, and of a Mania.*

THE madness of melancholics differs from the febrile delirium or a phrenzy, in that it appears without a fever, and continues, moreover, with obstinacy for many months, or even years;



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years; whereas a delirium, with a fever, terminates much sooner, either in health or death. It differs from a mania, as it is not attended with those furious outrages which are observable in maniacs.

In the highest melancholy we see the face looks contracted and pale, while a great anxiety is felt about the præcordia, as if the chest were forcibly compressed: and there frequently ensues a kind of diabetes, or large discharge of a most clear and limpid urine. The pulse is at this time small, weak, slow, and rare; the blood, therefore, here deprived of its more fluid parts, continues moving on with a weakened force through the cramped or contracted vessels, from whence an easy occasion is given for the grosser parts of the blood to run together into cohesions; at the same time the oppression about the heart, which accompanies extreme grief, and occasions a most troublesome sense of sickness about the stomach, denotes that a free course of blood is hindered thro' the portal veins; and in consequence



quence of this the said gross dregs of the blood will very quickly adhere to the vessels of the abdominal viscera, and will consequently not only produce atrabiliary or melancholic humours, but hysterical and hypochondriacal complaints likewise. Add to this, moreover, that severe grief engages the mind too intensely upon one and the same object, and prevents sleep: whence we may very easily account for the atrabiliary and melancholic humours within the body.

Fevers, such as are the most difficult of cure, are known to follow after the most sultry and hot summers, in the autumn season, and which at their beginning appear continual, but afterwards put on the type of intermittents; in these we observe a great anxiety about the præcordia, and if the inspissated bile be not discharged from the body, the patients will languish often during the whole winter: and then in the spring following the said atrabiliary matter will

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become



become fused by proper solvents, and come away from the body by stools like so much melted tar.

Dense and lean bodies are more liable to these disorders, because the more subtle fluids are more forcibly expelled and dissipated by the greater strength of their vessels, while they still retain those that are more gross or clammy.

A warm and moist air is proper in these cases; for here the most liquid and moveable parts of the blood are dissipated, the remains grow thicker, the smaller vessels exhausted collapse or shrink up, and the whole body becomes drier; the solids are all rendered more rigid or inflexible, and the fluids yield with more difficulty to the given impulse; and thus brings on a strict and dry temperature of the whole body. But an air which is warm and moist will, therefore, weaken this too great strength of the solids, while at the same time it applies a watery and thin vehicle to the thickened fluids; for it is plain, that when the bi-



bulous veins, which open throughout the surface of the body, are relaxed by warmth and moisture, they will absorb the watery vapours in the contiguous or ambient air. And this is the reason why the spring season is the most favourable for curing this and most other chronical distempers, because it comes joined with such a temperature of the air.

Summer fruits, if they be perfectly ripe, are of great service in these complaints: these fruits abound at a season of the year when people are the most heated by the scorching rays of the summer sun, disposing the blood to an atrabiliary spissitude and acrimony, and then these fruits continue till the autumn, that by the revolving power of these, the melancholic matter may be attenuated, which was collected during the precedent summer, and be by their gentle laxative force carried out from the bowels. I have even known melancholy mad persons, in the most raving degrees of the



distemper, cured by feeding wholly upon summer fruits, such as cherries, strawberries, &c. taken to the amount of three or four pounds in a day, while they have obstinately refused all other food and medicine, from a suspicion of being poisoned.

Although atrabiliary humours may occupy divers parts of the body, they, however, above all, most frequently settle and fix within the abdominal viscera. It is demonstrated that the most moveable parts of the blood, driven by the heart into the aorta, recede thence with a greater velocity, and in a more direct course, while the more viscid and less moveable parts go on slowly and laterally; and therefore, agreeable to the laws of *hydraulic* these last will be carried more abundantly into the descending aorta, from which spring the celiac and two mesenteric arteries which supply the abdominal viscera. Since, therefore, in the present malady, many of the more subtile and moveable parts of  
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the blood are exhausted from the habit, while the more viscid and less fluxile cohere closer together; therefore many of the grosser parts of these last will fall into the said visceral arteries; and if we then consider, that all this blood of the abdominal viscera is obliged to be rendered, in a manner, twice arterial, before it can return to the heart, which obliges the course of the humours to be extremely slow; it will appear very evident, why the atrabiliary humour is the most frequently of all deposited upon the abdominal viscera, although it was before equally distributed through all the circulating juices. It is well known what influence a strong respiration has towards quickening the circulation through the abdominal viscera; because, when the diaphragm and muscles of the abdomen then act, all the contents of the belly are compressed, and by that the motion or return of the venal blood is promoted. Since, therefore, melancholic persons



intent upon one and the same object, generally neglect all motion for a sedentary and still life, or even sometimes too closely apply to their studies, with their body inclined forward, the free course of the humours will in them be still more impeded thro' the abdominal viscera, and this in a more eminent degree when they continue long sitting in that posture after they have made too plentiful a meal. For this reason it can never be sufficiently inculcated to the literati, who are so frequently subject to this disorder, that they accustom themselves to sitting with their body upright, and not lean with their belly to the table at which they are seated: since the secretion of the bile, no less than that of the other humours, prepared by the viscera of the abdomen, results from a course of healthy juices through the vessels, which in this case is hindered by the degeneracy of the juices to an atrabiliary cacochymia; it  
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thence easily appears, that all the alimentary secretions must in this case be disturbed, and that the secreted juices themselves, must be altered from their natural or healthy conditions. But it appears from the whole history of chylickation, that to subdue or change the crude nourishments, there is required a due quantity and quality of the bile, and clear juices which flow from the stomach, pancreas, and bowels themselves, &c. And therefore from this defect, the first digestion will be greatly injured, and the nourishments will be changed, rather spontaneously, in the natural course of their corruption, than assimilated into our own juices, while they stagnate in so warm a place, into which the common air has a free admittance. Thus the aliments rather will degenerate into various kinds of acrimony, according to the diversity of their nature; from whence new mischiefs will again arise; hence flatulencies, with cramps of the stomach and bowels: moreover, as the



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secretion of the bile is deficient, the bowels are less stimulated to unload themselves by stools; and as the bowels are less furnished with that lubricating mucus which drains into them, of a due quality and consistence, from numerous follicles, or cells in their membranes; therefore the excrements are longer retained in the large intestines, become dry, and are with much difficulty excluded.

The curative indication in the present case calls out for the discharge of the atrabiliary matter from the viscera in which it is arrested, lest by long standing there it should become more thickened and cohesive, so as to concrete with the vessels themselves in which it is lodged, and produce incurable obstructions and indurations. And as the perverse maldy grows still worse by delay, it appears to demand the most effectual remedies, without loss of time: "Because when the disease is become  
" inveterate, and, in a manner, habitual or natural, it is next to incurable."

*Inve-*



*Inveteratus enim (says TRALLIAN) & veluti in naturam conversus, morbus incurabilis propemodum evadit* Great prudence, however, is required in this work, since the tough atrabiliary matter yields neither easily nor presently to the operation of mild remedies; and yet by those which are more violent, it is often roused and provoked to do dreadful mischief. Certainly, if the atrabiliary suburra be duly liquified by resolvent medicines, and a suitable regimen, so as to flow from the bowels by a spontaneous purging or flux, it gives the greatest relief to the present distemper; and therefore in that case, purgatives are convenient; but if, without this liquification of the matter, purgatives draw off the thinner juices from a melancholic body, they are always bad.

Since, therefore, a total expulsion of the atrabiliary matter can hardly be attempted without danger, unless it be first rendered fluid and moveable enough to yield to the most lenient purgatives; this



must be therefore the intention first pursued. But even in this again, some prudence is required; for we know all the abdominal viscera send their venal blood to the liver, and, therefore, if the matter be too precipitately resolved in them, so as to pass their arterial extremities into the portal veins, the said viscid matter will be thrown upon the liver: but since there is sometimes a great acrimony joined with this atrabiliary matter, which produces no great mischief while it lies wrapped up in the said tar-like viscid; yet if the acrimony be set at liberty, and be roused into action, so as to rush with violence at once upon the liver through the portal veins, it may thus entirely destroy, or at least greatly injure this tender viscus; for these reasons the dissolution of the matter of this distemper is not to be urged too hastily, and ought always to be attempted by such medicines, as, without acrimony, have a powerful resolving quality.

Now there are a variety of salts, and those even of an opposite nature, that may be  
be



be employed in making medicinal soaps, and we should chuse out such of them as have an acrimony opposite to that we know prevails in the atrabiliary viscid. If, for example, the symptoms indicate a rough sourness, it will be proper to use a course of the Venice soap, made of an expressed vegetable oil, and a lixivial or alkaline salt; but if, on the contrary, a putrid cadaverous acrimony, or an oily rancidity appears to prevail in the blood, by the proper signs in those circumstances, the acescent saponacea will be of the greatest use; such as honey, simple oxymel, juices of tart summer fruits, and the officinal jellies or syrups prepared from them, which yet would rather increase the first case, or acid acrimony, as they are all of them spontaneously ascescent, or easily inclined to turn sour.

Exercise, provided it be not too violent, is very proper in these disorders; for otherwise, by over-heating the body, the most liquid juices are dissipated, and the quantity of atrabiliary matter increased,



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creased, and rendered more turgid, which would be attended with great danger: intense heat is for that reason to be avoided.

They frequently discharge a thin saliva; and this more especially happens when the free circulation is impeded through the viscera of the abdomen, stuffed up with a viscid atrabiliary humour, and consequently there is an obstruction to the secretion of the intestinal lymph, pancreatic, and gastric juice: now as the salival glands separate the same kind of humour from the blood, therefore during the obstruction of the former, there will be a greater separation of saliva, by which the mouth will be continually moistened by a frequent thin spitting. Melancholic persons are for this reason distinguished by the appellation of *spitters*: but such frequent spitting is bad, both as a cause or a sign, since it denotes the vessels of the abdominal viscera to be stuffed up, while there is a great quantity of the more liquid and  
fluxile



fluxile parts exhausted from the blood by the profuse and thin spitting, which must aggravate the distemper.

It is always of the last importance towards the cure of diseases, to give due attention to such discharges as naturally arise from diseases with some apparent relief.

A filthy eruption of scabs, or a leprosy, has often succeeded upon these cases, attended with great advantage: and the reason is this, the matter of the atrabilis is not only offensive by its thickness and tar-like tenacity, but likewise on account of the great acrimony which attends this tenacity also, and which, indeed, does no great harm, so long as it lies intangled in the said tenacity; but when from any cause the atrabilis is become fused, and put into motion, it may then easily mix with the circulating juices, and if it be urged with some force upon any particular part of the body, the very worst and most incurable maladies may follow: but if the  
atrabilis



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atrabilis be gradually fused, its acrimony will be likewise gradually extricated, and being diluted with the lymph of the body, may pass therewith to the emunctories of the skin; and irritating the small vessels by an acrid stimulus, it will be unable to escape by insensible perspiration, but adhere to some of the smallest cutaneous vessels, which it will slowly corrode, so as to produce all these evils. A dropfy is good that succeeds upon a mania: now to understand the reason of this, it is to be observed, that this distemper arises sometimes from a too dissolved state of the humours, which therefore drain from their larger vessels, into the cavities or cells of the body, and are collected in the adipose or cellular membrane. Now such a colliquation of the humours coming upon a maniacal person will also resolve or melt the atrabiliary viscid, so that it may either escape from the body, or else be deposited upon parts less important, with a relief to the distemper; so likewise will a saliva-



salivation frequently cure this disease. If a mania be occasioned by the atrabilis, we may hope, that when the matter is evacuated, the patient will be cured; but when the common sensory is so altered by any violent passion of the mind as to bring on a mania, it is sufficiently evident, as we cannot learn what produces this change within the common sensory, that we cannot judge what remedies will remove it.

Opiates, after previous evacuations, may be of service, and especially when attended with stubborn watching; and it is remarkable that maniacal patients will bear great quantities of it.

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*Of Canine Madness.*

THE properties of the canine virus is as wonderful as it is difficult to be accounted for.

In general hydrophobous patients are seldom delirious, and though they seem  
to



to look angry and threatening, are clamorous, and incline to bite those about them, yet do they chiefly remain sensible to the very last; nay, admonish the bystanders to take care of themselves, whenever they find a fit coming on, which is known by a greater redness of the face, a fixedness or immobility of the eyes, and distortions in the muscles of the countenance. This very miserable state does not, however, hold long; but the pulse now begins to flag and grow instable, the breathing becomes very difficult, and a cold clammy sweat appears upon the whole surface of the body, and they expire convulsed. The hydrophobia seldom runs beyond the fourth day, computing from its first appearance.—It has been universally observed, on opening the bodies of those who have died hydrophobous, that a considerable quantity of bilious matter has been found in the stomach, or that the gall-bladder has been distended with a thick and black bile, and that the pericardium was quite



quite dry; and it is well known that the internal surface of the pericardium, as well as that of the heart and its auricles, with the large venal and arterial trunks near the heart, all included by the pericardium, are continually moistened by a very thin vapour, that distils from the exhaling vessels of these parts, so as to hinder the heart from growing to the pericardium, and to preserve at the same time the necessary flexibility in all those parts. Now since this exhaling vapour is some of the thinnest and most fluid portion of the blood, it must of course be diminished, nay, sometimes be entirely deficient, when all the finer parts of the humours have been exhausted in sweats and continual agitations, without any fresh supplies of drink.

The lungs are stuffed up with congested blood, because all the blood returning in the veins from the whole body, must first have a passage through the lungs, before it can be again distributed throughout the body by the branches of



the aorta. Now after the several secretions have been performed, while the blood flows through the arteries, a great deal of its most fluid parts will fly off, and leave the venal blood much thicker and less moveable: but in healthy persons, all that is absorbed into the bibulous mouths of the inhaling vessels which open through the whole extent of the stomach, intestines, outward skin, and other membranes, passes directly into the veins, and becomes mixed with the venal blood before it is driven thro' the lungs; and thus the venal blood is kept sufficiently diluted and fluxile to pass through the final extremities of the pulmonary arteries. But in this disease before us, all recruit from diluent liquors to the blood is intercepted; and of course the said cohesive fluid must, in a little time, begin to be arrested in, or at least gain a very difficult passage through the said arterial extremities in the lungs; whence arises that intolerable anxiety and difficulty of breathing. Sometimes

a total



a total dissolution of the humours will happen, and then the blood will never be arrested or accumulated in the lungs, but easily passes on to the left ventricle of the heart, for which reason the venal system will very readily empty its contents into the arterial. Now, since at the same time the blood, however dissolved, cannot be urged through the final extremities of the distended arteries, unless a considerable impulsive force be impressed on it by the arterial coats, and by the heart, therefore in defect of this force, the blood will be congested in the arteries; because whenever there is such a mischievous dissolution of the texture of the humours, all physicians observe the pulse to be very quick, weak, soft, and intermitting; which is a plain sign that the vital powers are oppressed, which move the humours through the vessels: but the blood will be less arrested within the branches of the pulmonary artery, because the whole force of the right ventricle drives the blood thro' the pulmonary artery and tho' the said force becomes weaker,



yet the more frequent and laborious breathings in this malady keep open this passage of the circulation, which is much shorter than the other, wherein the blood is driven by the force of the heart thro' the extreme branches of the aorta, thro' all the parts of the body, even to the skin; and for this reason it is usual, in these cases, for the extremities to be cold or chilly, while a great heat is perceivable about the præcordia.

The seat of this malady is principally about the stomach, gula, and parts adjoining; this is confirmed by the very symptoms, great anxiety and oppression felt about the præcordia, inflation of the stomach, when any kind of liquid is offered, bilious, brown vomiting, of a disagreeable smell: they are frequently delivered by vomits.

*Of*



*Of the Scurvy.*

**H**ÆMORRHAGES from the nose, and those even to a degree of danger, are very common in scorbutic people, and they are at the same time very little disposed to exercise; the slightest injuries break their skin, and leave ulcerations, and this more remarkably so in their legs, where even upon the least scratch of the skin by the finger nails, excoriations will happen, which are succeeded by sores, which will remain for a considerable time.

The true and primary cause of the scurvy, is no other than a too long continued abstinence from fresh-gathered vegetables and garden stuff.

In the autumn seasons, after very hot summers, intermitting fevers have been very frequently known to follow, with anxiety of the præcordia, a slight yellowness in the eyes, and a urine somewhat of a jaundice colour; all which symptoms



denote obstructions formed in the abdominal viscera; when plenty of resolving medicines have been given here upon the intermediate or well days, the commotions into which they are afterwards put, together with the humours by the consequent fits of the fever, often clear the stuffed-up vessels and viscera from their clogging matter, so as to dissipate the fever it produced: or if the fever continues on the patient, it then readily is cured by the use of the Peruvian bark, after once the viscera have been cleared from their obstructing matter. But when the bark is too hastily administered, before the febrile matter has been duly resolved and expelled, these patients are then left in a languishing condition, and by repeated doses of this excellent drug, given upon the first signs of the returning fits, before the vessels are opened, stubborn obstructions are often left throughout the whole mesenteric system of vessels, and give birth to melancholic, hypochondriac, and scorbutic distempers.

In



In chronic diseases, gradually arising from vitiated humours, and which, by slow degrees, injure the functions of the body, we often find it very difficult to discover and point out such pathognomonic signs as may afford a certain diagnosis of the present malady; and this more especially in the beginning of it, where the health of the patient does not seem to be much injured, but rather, as it were, drooping.—However, authors are all agreed in this, that in the beginning a scurvy is accompanied with *an unusual sluggishness of body and mind, with a spontaneous lassitude of the whole body.*

The spontaneous lassitude, when it is the presage of an acute distemper, soon terminates in one; but if it arises from an obstructed or retained perspiration, it will go off by rest, a thin diet, and a mild diaphoresis, or in case this be neglected, it may sometimes produce a more dangerous distemper. But in the scurvy, this kind of lassitude slowly advances upon the pa-



tient, gradually increasing for many days, often weeks, without any other consequent complaint; and it has, moreover, this peculiarity to itself, that the weariness seems more troublesome to the patient upon waking out of a sleep, than it does at any other time of the day; whereas lassitude, arising from other causes rather abate after sleeping.

EUGALEN observes very justly, that the difficulty of breathing in scurvies may be readily distinguished from that which arises from other causes in other diseases, as it is not attended with a cough, wheezing, rattling in the wind-pipe, pungent, pain, orthopnæa, or any other complaints of the same kind, peculiar to distempers of the breast.

The legs and ancles frequently swell and subside, and the reason is evidently this: since the venal blood ascends from the lower limbs of the body, towards the heart, with difficulty, nature has therefore furnished those veins with a greater number of valves, and placed them



them either upon or betwixt very considerable and active muscles, by the pressure and motion of which, the blood in the adjacent veins may be accelerated towards the heart; and hence we often observe the legs swell in persons who sit long inactive, because the smaller veins cannot now easily empty themselves into the larger ones that are over distended. But since an unusual slothfulness and defective breathing, from very slight exercise, attend upon this malady, so as almost to entirely prohibit all muscular motion, the reason appears evident, why a swelling of the legs so often attends in this disorder.

The teeth and gums are often very early affected in the scurvy: ulcers are in no part more mischievous and difficult of cure than those in the legs, and more especially about the ancles: the whole circumference of such an ulcer appears brown, or spread with a bluish purple colour, while the bottom of the fore looks foul or sordid, the lips of it rough,

as



as if gnawed, and the matter weeping from it is of a fætid smell: they cicatrize or heal with great difficulty, and readily break out again.

Cocchi, a celebrated *Italian* writer, suspects the elephantiasis to be a species of the scurvy, and that the reason why it was more frequent in *Egypt*, might be owing to the great scarcity of vegetables in that country; and he very judiciously observes, that elephantiacal patients, who most despaired of being cured, after they were banished the society of mankind, on account of the foulness of the distemper, into remote deserts, were not recovered so much from the eating of vipers, as from their finding no other sustenance but such as plants and vegetables afforded them.

Neither do the internal viscera escape the fury of the scorbutic acrimony; and I have particularly observed enormous pains about the cardia and stomach tormenting these patients, which have increased upon them after taking nourishment,



ment, although their appetite to food has continued sharp enough. The pericardium, lungs, pleura, and diaphragm, have been found not only adhering together, but in a manner melted or mixed into one mass, in scorbutic persons, who have died suddenly by suffocation, with a great oppression at the breast; and yet it is something very wonderful, that under so violent an acrimony of the juices, the tender fabric of the brain should have been always found in a healthy and sound condition; and indeed the observations which have been made through the whole course of this distemper assure us, that the actions of this viscus have continued sufficiently entire. There are, indeed, sometimes, convulsions, tremblings, palsies, and the like, which attend this malady, but then they rather are the effects of injuries of the nerves and muscles, than of the brain itself; since we find the memory, understanding, reason, and judgment, remain unhurt.—It is to be remarked, that intense  
hunger



hunger continues as long as violent scorbutic persons have lived: this *POUPART* derives from the sharp humour which he found in the stomachs of those who have died of this malady.—The same author has observed in those who have died suddenly in this distemper, all the viscera corrupted, and in many the auricles of the heart were enlarged to the size of a man's fist, and filled with congealed blood. It is not at all wonderful that patients may become convulsed in the worst stage of the scurvy, although upon opening their bodies there may be nothing found amiss in their brain: for if only bile floating into the stomach can produce convulsions, which immediately cease when the foul humour is thrown up by a vomit; and if sharp periodical pains, with ulcerous humours lodged in the body, can produce a terrible epilepsy, what effects of this kind may we not fear in those whose very bones are almost all of them become carious, and whose ligaments are found eroded by the acrid  
sanies



fanies collected in the cavities of the joints, whose pericardium has been found almost eaten up, and the heart itself deeply ulcerated; and lastly, whose tender viscera are moistened by a filthy liquor, so acrimonious, as even to ulcerate the faces, and fetch the skin off the hands of those who have dissected such subjects?

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*Of the Cachexy.*

**T**HE continuation of life demands a constant recruit to the solids and fluids in proportion to what is daily exhausted.

Fat substances are very difficult to digest, and are long retained in the stomach, by which means they turn rancid, and become productive of much mischief: healthy and strong persons often experience, that after making their dinner upon bacon or other fat meats, they will, towards evening, belch up an acrimonious oil, which almost excoriates the throat



throat or fauces, and being spit into the fire will blaze with violence. If this fat oil remains for a long time in the stomach undigested, as it will, even after the other aliments are emptied into the bowels, it may, in the remaining tract of the intestines, produce a rancid crudity highly mischievous, unless it be corrected and reduced to a soapy state, miscible with watery liquors, by a plentiful flow of strong bile into the duodenum.

*Ab exercitationibus quies & ab ingentibus laboribus otium.* “Rest after accustomed  
“exercises, and living idle after great  
“labours and fatigues,” is very justly reckoned by ARETÆUS as one of the causes of a cachexy.

And so is too great strength or toughness of the vessels and viscera, because the excessive cohesion of the solids that compose them, will not yield enough to the impulses of the liquids they contain, whereby, of course, the equable motion of the blood is interrupted, so as to dis-



turb all the secretions. Whenever the due quantity of our healthy indigenous humours is, from any cause, much diminished, the assimilation of crude alimentary juices is but imperfectly performed; whence the nutrition of the body becomes depraved, and a cachexy ensues. But the greatest danger of all to be feared from this quarter, is when some profuse loss or discharge of the healthy humours has been suddenly made from the body, as in persons wounded, or women who miscarry, with excessive floodings or hæmorrhages from the womb, or the flux of the cholera morbus, which, in a few hours, almost empties the whole body; such bodies are, indeed, to be filled again, but very slowly; and to avoid a cachexy, they must not be allowed to take much aliment at a time, however keen and sharp their appetites may be.

A firm, robust, or healthy blood is required to pass the substance of the brain, in order to secrete the subtile fluid of the

nerves



nerves that is required for muscular motion; and as in cachexies the blood and its humours are depraved and of unhealthy condition, the nervous fluid will, of consequence, be variously deficient, both as to quantity and quality, in those conditions which are required in it. The chearful disposition to motion and exercise, so remarkable in healthy persons, will be here certainly wanting, and the cachectic patients will, with great difficulty, be enabled to draw their weak limbs after them. It is moreover observable, that whenever the free circulation, or course of the blood is hindered through the vessels of any certain part, the said part will be presently seized with a sense of weight; when a violent phlegmon, for example, seizes the arm, it feels as heavy as lead; and since a cachexy is frequently conjoined with a sluggish cold clamminess, and cacochymia in the humours, and renders them more difficultly passable through the vessels, it will be evident that a weight may be perceivable in the limbs from more causes than one.

It



It is well known that the humours contained in the veins are driven forwards through them towards the heart, by the motion which they received from the arteries, and since the veins have no pulsation, but gradually widen in their course, it necessarily follows, that the motion of the fluids, circulating from the arteries into the veins, will be checked or retarded; on which account we observe in many parts of the body, that the arteries and veins lie contiguous to each other, that the neighbouring vein may be compressed by the expansion of the beating artery, and promote the motion of the returning blood through them to the heart. Moreover, the muscles, when they contract, press upon all the circumjacent veins, and such as run betwixt them; and thus again is the motion of the venal blood very much promoted. But in those who are cachectic, the power or action of the heart and arteries is very languid, and

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the motion of the muscles very weak; whence those helps are wanting which conduce to forward the return of the venal blood to the heart. Hence the larger veins are hardly able to empty themselves, and the smaller lymphatick veins, which ought to have absorbed the lymph discharged by the exhaling arteries, from the lesser and larger cavities of the body, as they cannot easily empty themselves into the larger veins, already too full, nor absorb the whole which the exhaling arteries emit, must necessarily fill the cellular membrane with watery humours, and produce oedematous swellings, more especially in such parts as are most distant from the heart, where the circulating blood is (*cæteris paribus*) proportionably slower than in others that lie nearer to the heart. Hence follows a swelling of the legs, more especially when the patients stand for a time with their body erect, or sit long with their legs pendulous, by which



which means the humours are forced upwards, contrary to the laws of gravitation; but when the body lies in an horizontal posture in bed, the humours contained in the veins may then more easily return back to the heart, the heat of the bed-cloaths also rendering the lymph more fluid, which was collected within the cellular membrane; for oedematous feet will always be cold.

Since the left ventricle of the heart can expel none of its contained blood into the aorta, unless it receives the same first through the lungs from the right ventricle, which last is now very scantily supplied, from the slowness of the returning blood into the veins, it will appear very evident why the pulse should be weak and languid. But as soon as these patients begin to move briskly, the over-filled veins being compressed by the action of the muscles, suddenly drive the



humours which they contain towards the right ventricle of the heart, which then becomes overcharged or oppressed, because it cannot send the blood so fast through the lungs, as it is urged upon it by the returning veins; whence a palpitation of the heart will follow, with a very laborious difficult respiration.

If the cachexy arises from a vicious diet, the foul humours lodged in the primæ viæ may be expelled by a prudent use of vomits and purges, and then by a proper regimen with corroborants.—If want of exercise has brought on a cachexy, motion and an active life will cure it; but if it be occasioned by a purulent abscess or scirrhus, seated in any of the viscera, it is then incurable, unless the cause can be removed, which is frequently not so easy a matter, nay, in general, almost impossible. If cachectic people are seized with a vertigo, loss or weakness of memory, tremors, and sleepiness, there is reason to fear the viscid and watery humours are already collected within the brain, whence there will be danger of an approaching



apoplexy; if they begin to pant and lose their breath upon exercise, we conclude the capacity of the breast and lungs are charged with a like humidity. We very seldom see those who are in the full vigour of life, and of a firm and strong constitution, subject to cachectic disorders but from violent causes; in which case they are not easily cured.

Those who would recommend the perpetual attenuation of our humours, never rightly consider the healthy nature of our animal fluids; for the blood of strong and healthy persons has a considerable spissitude or thickness, by which it is immediately disposed to harden into a solid cake, when drawn from the veins; whereas in weak or valetudinary persons the blood is much thinner, and less disposed to cohere. If this one practical observation had been considered, they would have easily perceived, that a too thin or dissolved state of the blood and humours, must render a strong and healthy person in the condition of one



that is weak and sickly. Moreover, each particular humour is required, to have a due consistence or degree of thickness, to confine it within the vessels to which it properly belongs; for if the red part of the blood were once to become as thin as the serum itself, the blood vessels would all soon be empty; or if it were to become as thin as the lymph which transpires through the exhaling vessels of the skin, the whole body would waste in a very short time. It is therefore plain enough, our fluids may offend by a too watery or inconsistent state, in which they are manifestly deprived of their healthy conditions. But since the thickest portion of the blood, namely, its red part confined within the larger arteries and veins of the body, receives its motion from that of the heart and arteries, and communicates the same, when so received, to the other humours, and as, at the same time, the natural heat is excited by the attrition of the same thickest part of the blood,



blood, and communicated to the whole body: therefore, when the said portion of the blood is too much diluted with watery liquors, which, at the same time, renders the solid vessels too weak and flaccid, the motion and attrition of the humours will be both ways considerably weakened, and the heat and warmth of the body will be proportionably lessened: hence again the said watery liquors will not easily be exhaled from the body, wherein it will remain distending the weaker vessels, and gathering itself into the hollow spaces of the body, will produce a cachexy or dropsy.

But besides the said over-thin state of the humours arising from an imprudent use of diluent liquors, there is another diseased fluidity of them observable, for want of a due pressure or condensation of them by the vital and elastic force of the vessels and viscera; or from the dissolving force of some diseased liquid intermixed with them, which melts down or destroys their due consistence.



Certain it is that the chyle prepared from the ingested aliments, has a less density than that of the red blood or its serum ; because the chyle floats upon the surface of the blood, after it has been taken out of a vein, but in length of time, and by repeated circulations thro' the vessels and viscera, it acquires a greater density, and changes into our own nature. But it seems an established principle, that the lungs do, by their action, principally conduce to this greater density and assimilation of the chyle, which is all of it obliged first to undergo the attrition of the lungs, before it can move on with the rest of the blood, through the arteries of the body ; and all the vital humours are obliged to pass in the same space of time through the lungs, while only a certain small portion of them flows through any of the other viscera. Moreover, the aorta is distributed over all the body and every different part of it, so as to send the nutritious fluid together with blood, throughout

out



out the whole system; but then the aorta receives all its blood from the left ventricle of the heart, into which the pulmonary veins transmit their blood that has first been pressed through the lungs, which last, therefore, seem to give a due degree of density to the chyle, and preserve, likewise, the firm texture of the blood itself. Hence the reason is apparent, why, when the lungs are diseased, we so often observe a consumption of the whole body, although no great wasting of it appears, either by expectoration or any other sensible discharges; sometimes, also, there are night sweats, arising from the too thin or dissolved state of the humours, not sufficiently condensed by the lungs, which distil thro' the cutaneous pores, or mouths of the exhaling vessels, relaxed by the heat of the bed cloaths. But since the same action which condenses the chyle, and renders it like the rest of our humours, is also employed in maintaining the sweet gelatinous and globular nature in all the  
rest



rest of our juices, which, in a healthy state, are not acrimonious, the reason thence appears, why a thinner state of our humours is commonly joined with a greater acrimony from the same cause; which acrimony requires to be moderately obtunded or corrected at the same time, that its too watery or thin state is rendered more consistent. Sudorifics and diuretics can only take place in a cachexy that inclines to a leucophlegmacy, or a dropical anasarca; but not where the body becomes juiceless, and is decaying by a consumption or marasmus.

Alcaline salts, and the soaps prepared of them, are very efficacious in dissolving tough and viscid humours, but then they are not convenient when the patient is under a course of chalybeates: for steel filings readily dissolve in an acid that is prepared from vegetables, but if an alkali be added to the said dissolution, the iron precipitates, with the appearance of a yellow earth or ochre, which being entangled in the mucus of the first  
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passages, may harden into a solid coagulum hardly dissolvable, so as frequently to occasion much trouble to the patient: for this reason, therefore, alkaline medicines are avoided, during the time that a cachectic patient uses the filings, or other preparations of steel, which are commodiously exhibited in infusion in wines or strong-bodied ale.— And for this reason too the patient should use such a diet as is rather *ascescent* than *alcalescent*.

When the body seems swelled with viscid humours, from too great a weakness of the solids, corroborant remedies will be of service; but when the humours, being in too dissolved a state, are drained or washed from the body, without being restored again by fresh nourishment, the vessels collapse and the whole body is destroyed by a slow *marasmus*, in which last case such remedies are required as gently moisten, and give a better consistence to the humours. Chalybeates in these cases, though proper,



per, should be varied according to the particular circumstances.—In a girl, for example, bloated or swelled with the green sickness, from a cacochymia of unactive mucous or viscid phlegm, iron or steel medicines should be given in a dissolved form, in a vegetable acid rather than in substance, because otherwise chalybeate powders, or steel filings, swallowed into the stomach, are apt to entangle themselves in the viscid mucus, and clog together, so as to pass on through the bowels, with little or no operation or effect on the body; but where the primæ viæ are charged with a sharp sourness, chalybeates are better administered in a dry substance, because at the same time that they obtund the sour acrimony, the dissolved steel will happily perform all its effects.

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*Of an Empyema.*

**P**ATIENTS under this disorder lie easy enough on their back, because the diaphragm descends much lower towards



wards the back and loins.—And for the same reason are they desirous of sitting upright in their bed, whenever a considerable quantity of purulent matter is lodged in the breast, because the weight of it in that posture presses down the diaphragm towards the abdomen, and thereby enlarges the capacity of the breast; and the breathing is thereby rendered more easy.

Those whose breasts are almost filled up with matter have red cheeks, and their countenance looks better, because in them the blood meets with a more difficult passage through the lungs, and of course the blood returning from the head by the jugular veins is more impeded in its reflux into the right cavity of the heart; whence the blood vessels of the face continue more than usually distended.—But a slow fever is usually the constant companion of an empyema, from the thinner parts of the matter absorbed and mixed with the blood. And as this fever  
gra-



fever gradually preys upon the habit of the body throughout, it is at length attended with an extreme leanness or consumption of all the fat: and since there is a good deal of this soft fat spread as a cushion under the globe of each eye, to sustain and facilitate their motion, therefore when the said fat is consumed among the rest, the eye-balls sink lower into their orbits or sockets, and the eyes are then said to appear hollow: and when the said fever has also consumed the fat that fills out the ends of the fingers, and constitutes the sense of feeling, the nails appear incurvated and more projecting. At the same time too a sharp heat is felt in the ends of the fingers, and in the palms of the hands, from the quickened or febrile motion of the blood through the more contracted vessels of these parts, that are yet more confined and compressed by the tendinous incumbent expansions, and are more dry or juiceless than other parts.

HIPPOCRATES has, with great care and industry collected together all the  
symp-



symptoms, by which a sure and ready diagnosis of this distemper may be obtained. He observes, that the side of the thorax which contains any considerable quantity of matter, so as often to yield no rattling noise, upon account of its being over-full, is more swelled than the opposite side; this is confirmed by the observations of our modern surgeons. And because the affected side grows hotter than the other, he therefore advises the whole thorax to be wrapped up in thin linen dipped in liquid bole or red earth dissolved or rendered very fine and thin by being well rubbed, and then directs an incision or cautery in the place which appears the soonest and most dry: or he likewise advises the whole naked chest to be anointed with a red-like liquid, and this on the same account; but then he very prudently observes that in this case several hands should be employed in rubbing in this liquid all over the breast, because a mistake might otherwise happen, as the part first rubbed in, would undoubtedly appear the soonest dry.

If



If a vomica has continued broken for four or five days, the physician ought closely to attend to the urine and stools, for if any matter be discharged that way, it is well; otherwise he must immediately, and without loss of time, have recourse to the operation of the paracentesis, which should by no means be deferred, if we are to expect any success from it.

We should never close up the external wound, unless the interior surface of the ulcerated thorax be rightly depurated, and afterwards thoroughly consolidated and cicatrised, for there might be danger of another empyema in consequence of such an incautious and imprudent treatment.

THE END.



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