

A mechanical account of fevers / By Laurentius Bellini ... Done into English: with a large explanatory introduction. Helping the better to understand some other writings also of the same author.

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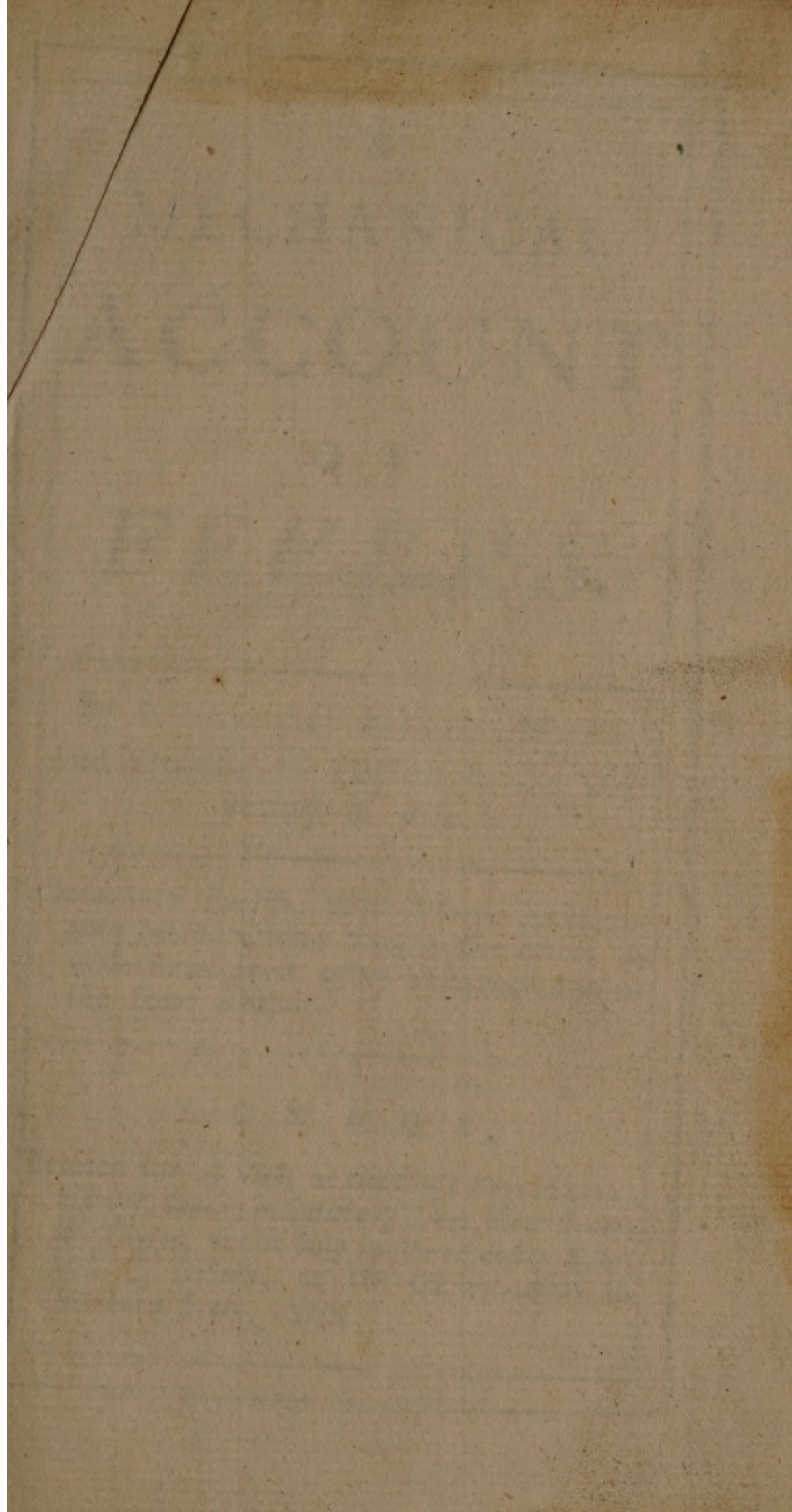


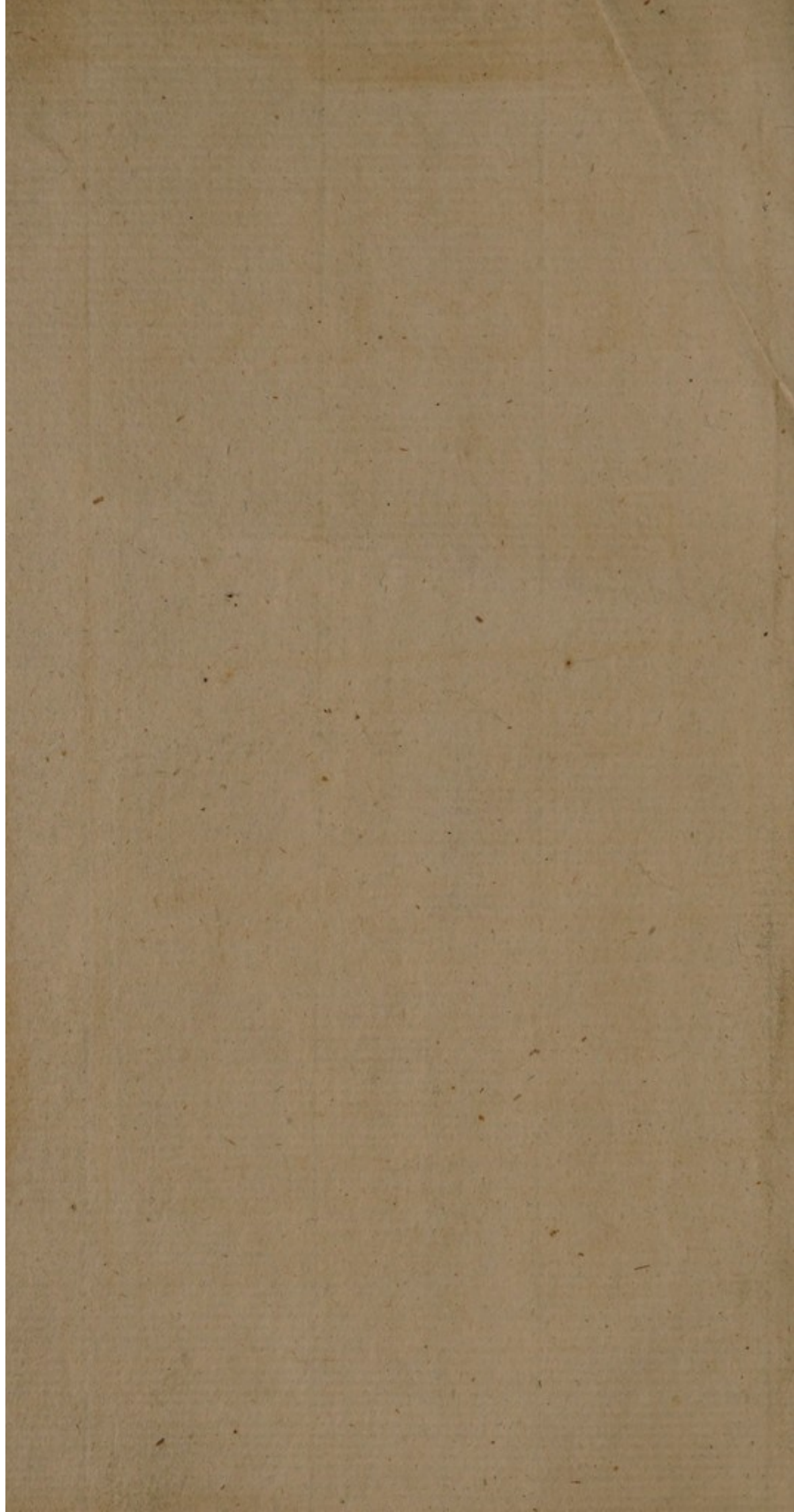
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A
MECHANICAL
ACCOUNT
O F
FEVERS.

By LAURENTIUS BELLINI, M. D.
And Professor of Physick in the Uni-
versity of *Pisa.*

Done into *English*: With a large Explana-
tory Introduction; helping the better to
understand some other Writings also of
the same Author.

L O N D O N,

Printed for *A. Bell*, at the *Cross Keys* in *Corn-*
hill; *J. Senex*, in *Salisbury Court, Fleet-street*;
W. Taylor, at the *Ship* in *Pater-noster-Row*;
and *J. Osborn*, at the *Oxford-Arms* in
Lombard-street, 1720.

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LONDON:
Printed for A. Bell, at the C. of the City, in Corn-
hill, by J. Sturges, in Pall-mall, near the
W. Taylor, at the Sign of the Rose, in Pall-mall, near
and J. Osborn, at the Sign of the Lion, in
Lombard-street, 1750.



THE PREFACE.



ALTHOUGH the Name of Bellini and his Writings, are both well known and esteemed amongst the greatest Judges; yet it may perhaps be acceptable to many Readers, for whose Use this Translation is chiefly designed, to be somewhat particularly informed of the Means and Advantages by which this wonderful Man made such surprizing Discoveries and Improvements in the Theory of Medicine.

A small Acquaintance with Books, and the State of Learning for the last Age, will teach any one how much the World hath been obliged to the Italians for their Advancement of the most substantial Philosophy, and leading into the only Means of arriving to the Knowledge of Nature, by Experiments, and Mechanical Reasonings thereupon: This happy Turn had its due Influences also on the Study of Medicine; and Malpighi, Redi, Steno, Borelli, with many others, laid a sure Foundation in Anatomy, and the Knowledge of what an Animal was in its natural State; and Borelli in particular, by his Application to Mechanicks, and the Laws of Motion, taught how to account for the Powers of the Muscles, and the more bulky Instruments of the humane Frame. But it was his Scholar Bellini, the Author now before us, who first taught, upon the same Principles and Conduct, to reason demonstratively about the more minute, and more unheeded Agency of the animal OEconomy; and he first carried the Understanding

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standing into the most obstruse and remote Scenes of Operation, with the same Clearness and Evidence, as it had been accustomed to in Matters much more open to the Senses.

By this it appears that our Author had not only a happy Turn of Thinking himself, but also a most fortunate Conjunction to exert it, being led by such great Authorities into the only Helps on which any true Knowledge can be built: And of what extensive Use his Writings have been in the Study of Medicine since, cannot be unknown to any who have Acquaintance with such Things even but by Report. From so great, so advantageous an Instructor, the World hath since enjoyed a Pitcairn, and hath now the greatest Professor, that ever filled the same Chair at Leiden; from him also this City hath now to boast of the most able Physicians in Practice; who not only prove Ornaments to their Profession, but their Country, in now teaching to Europe by their Writings what they themselves first learn-

ed from Italy: Their Names need no Mention, because their Works testifie of them to the most knowing Parts of the World.

Tet because the Reader may be more excited in his Attention to the following Pages, by some unquestionable Testimonies already on Record, to our Author's happy Abilities, it may not be amiss to repeat what Pitcairn hath said in his Preface to the last Edition of his Dissertations, where mentioning the little Regard to the Opinion of those who had not received a Turn to that way of Thinking, which he judged to be the only Foundation of Knowledge in Physick, he owned himself fully satisfied in the Approbation of a few then living, whom he names, and adds, Nam BELLINI ad deos abiit, for Bellini is dead. A Compliment not only worthy the Person it is applyed to, but also very expressive of that disinterested Elevation of Mind with which the Speaker was most singularly endued.

Further,

Further, The last Edition of this Work, whereof this is a Part, was under the Care of Professor Boerhaave, whereunto he prefixes a very just and copious Recommendation, and particularly to his Pupils, to whom he thus concludes, Vos igitur Optimi Medicinæ Tyrones, hunc nocturnâ volvite atque diurnâ manu. You who I have most Esteem for as Students under me in Medicine, let this Author be your constant Study.

But why the Writings of a Person thus much in Esteem should not sooner spread in other Languages, than that only in which they were wrote, may be accounted for both from the Manner of Reasoning, whereupon they are strictly conducted, which but very few have been, till lately, acquainted with; and from the particular Style of Bellini, which, through an uncommon Diligence to keep the Mind close in View of the Subject, and to avoid too much Transition in Deduction, runs out into very long Periods, and

seemingly troublesome to such, who have been accustomed to read but with slight Attention.

As to the first of these Difficulties, we now have it to say, that almost every Day brings this way of Writing into Repute; and by the Encouragement of some great Examples, and the continual Helps from experimental Philosophy, the growing Age is brought into a Way of Thinking and Expression that abhors every thing delusory and hypothetical about Objects that are corporeal, and will not be satisfied without sensible Evidence, and such demonstrable Deductions therefrom, as keep in View every intermediate Transition from the first Principle to the most distant Conclusion, with as much Clearness and Strength of Proof as in a Proposition almost Self-evident: As to the latter Objection, it is endeavoured in this Translation, to avoid as much as possible, all the long Sentences and Periods of the Author, by breaking them as much as the Matter and Connection would bear, into shorter

shorter and more easy Conclusions; whereby the Mind is not so much wearied in Attention, and the English rendered more easy even to a Latin Reader. And to a Want of this Liberty, it is imagined, may be ascribed not only the Reason why Bellini hath so long lay untouched in this Nature, but also why many Translations are so much inferior to their Originals.

It may not be amiss here likewise to advertise, that as to our Author's Method in general, on the following Subject, it is as much conformable to the usual Distinctions of Fevers, as is consistent with his new Manner of treating it. In the Beginning therefore, the chief Distinctions of them are enumerated, with the Affections observed by common Experience to belong to each particular Division. Then follow general Propositions, shewing how the Antecedents, Concomitants, and Consequences of all Fevers, do necessarily produce certain Changes in the Blood, which are attended with certain Symptoms,

Symptoms, and followed by certain inevitable Alterations of the Habit; after which, the same immediate Cause is pursued into all its various Shapes of Existence, as determined by its Antecedents, and producing all the Variety of Appearances in particular Kinds of Fevers; so that the Reader will find all the Way a close Connexion between the first Division of Fevers into certain Classes, the general Propositions illustrating the common Cause of all, and the particular Ones, explaining the several Affections peculiar to every particular Kind.

*If to any it should be a Discouragement that herein is nothing extended to particular Practice, such are to be told, that a Master in the Theory, assisted by Experience and common Opportunities of Observation, wants no such Helps; and that wheresoever such Helps, as particular Forms of Prescription, come in the Way of any Person unskilled in Theory, and the true Foundation of Practice, they are
of*

of no other Use, than as sharp Instruments in the Hands of the unskilful, who are likely to do much more Harm with them than Good. The Art of Healing is now as much ceased to be the Gift of an Enthusiast, as that of a different Talent, and is now acknowledged to require the Assistance of humane Reason to conduct it; where therefore some Knowledge in the Structure of a humane Body, and the Nature of its Disorders, do not direct to the Means of Remedy, it is more than Ten thousand to one whether Means otherwise supplied ever answer their End; consequently whosoever is well acquainted with the following Theory, will know how to act in every particular Circumstance; and without such Knowledge, no Choice of Remedies, or particular Directions, will be of Use.

The Reader will likewise in many Places here observe Mention to be made of other Works of the same Author; if therefore the Pains which are here used to make this Part concerning Fevers acceptable in English,

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English, shall hereafter appear to answer the End, it may be Encouragement for bestowing the same Labour upon the Rest. But yet further to bring Writings of this kind into more Esteem, by being made easy to understand, there is hereunto prefixed a large Introduction, explaining every thing that may be imagined difficult to Readers not yet accustomed to mechanical Reasoning; and which, it is hoped, will not only facilitate their Progress through this Work, but make them both more able, and more desirous to be acquainted with the other Writings of the same Author.

Why in the Title it is called a Mechanical Account of Fevers, will not want any Apology to those who are rightly acquainted with the Import of that Term; Bellini hath truly treated this Subject in that Manner, and that hath been the greatest Motive to the Translator for his Pains therewith; the more especially too, because he conceives that if Readers of such Subjects could be initiated in-

to

to that just Way of Thinking, which a right understanding them does necessarily require, they will soon be brought into Contempt of that unmeaning Trash, and surprizing Emptiness, with which some Authors have lately entertained them on like important Subjects.



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THE PREFACE

in that part of the work, which is
concerning the more necessary
parts, they will soon be brought
to the notice of the numerous
persons, to which they have been
sent, and which will be
important subjects.



THE



THE
EXPLANATORY
Introduction.

BEFORE we go into any particular Explanations of Passages, or Terms in the following Pages, which may otherwise be difficult to Persons unaccustomed to such a Way of thinking and writing; it may be necessary to observe, that *Bellini* himself hath been so much aware of the Occasion for such previous Instructions, that to his Works he hath prefixed several *preliminary Propositions*; those therefore which relate to this Part, here translated, we shall first give the Reader, with such further Explanations, as may facilitate the main Design of understanding

standing the Whole aright: And this we shall do without any Regard to that Order *Bellini* hath given them; selecting them only as they best suit our Purpose for the following Work.

I. *The Blood circulates, as demonstrated by Harvey, &c.*

II. *When the Blood flows out of the left Ventricle of the Heart, its Force through each Trunk of the great Artery will be as the whole Momentum of Velocity communicated to it from the Heart; but its Velocity through the whole Length of the Arteries will be only as the Excess of that Momentum above the Resistances of those Arteries.*

III. *The Volocity of Blood through Arteries, whose Origin is from Trunks near the Heart, is greater than in Arteries arising from Trunks at greater Distances.*

IV. *There is a Liquid in the Nerves that thickens with Heat.*

V. *The Nerves in a natural State are always full of this Liquid, and it is in continual Motion through them; but with a very slow Pace, from the Brain towards the extream Parts; and it is separated*

rated by the Glands in the Brain: With the Brain we here also include the spinal Marrow.

VI. *That Power by which the nervous Liquid is derived from the Glands in the Brain, and set into Motion forwards, is a Pressure arising from the Dilatation of the Arteries, woven through the Pia Mater, and intimately interspersed through the whole Substance of the Brain.*

VII. *Although this Liquid moves through the Nerves with a continued Pace, yet it does not fall into the Parts, whereinto they open, continually, but alternately; nor is it necessary that the Times between every Efflux should be equal in every Part, for they may be greater or lesser, yet so frequent as to appear continually to distil, and produce Effects continually in Operation.*

VIII. *The nervous Liquid alternately distils into all the Muscles, as well those having Antagonists, as those which have none; and it exerts an Impetus upon all; but where the Muscles have equivalent Powers it is imperceptible, in others not so.*

- IX. Upon the Impression of sensible Objects there is a Reflux of this nervous Fluid made in the Nerves, with an Impetus exceeding that by which it flows from its Origin.
- X. The reflux Motion of the nervous Liquid, is always in Waves, whether it be occasioned by the Impression of sensible Objects, or muscular Contraction.
- XI. The Tremor or Vibration of a Nerve, and the Undulation of its contained Liquid, is as the Momentum of the contractile Muscles, or the Impression of external Objects.
- XII. The Tremor of one Nerve will shake all those in Confluence with it.
- XIII. In every Wave of this Liquid, the most subtile Part, which is called Spirit, will have a Nisus from the Centre of every Wave towards the Superficies of the Nerve on every Side, and gradually break through; and this is the very Matter of Perspiration in a natural State.
- XIV. The Separation and Derivation of any thing from a liquid, unequally Fluid, and confusedly passing through the Vessels, is by
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a Composition of two different Motions, one of which acts longitudinally, that is, parallel to the Axis of the Canal, and the other with a Nisus against its Sides.

XV. *The thinnest Part of any Liquid, unequally Fluid and at Rest, will soonest be forced out by any compressive Power.*

Thus far is collected from our Author's own introductory Propositions, to his whole Work, as they are such; and such only amongst them as particularly lead into some of the most difficult Passages of the following Account: And what he adds to the whole is likewise proper here; *It behoves every Reader to be Master of these PRECOGNITA; nor will any one stumble at Obscurities, who is duly herein instructed.* And to be thus far prepared, requires only a tolerable Acquaintance with a humane Body in Health; especially the Conditions of Circulation and Secretion, and with the common Principles of Mechanicks, and the Laws of Motion.

To such therefore the foregoing Propositions want not any more particular Explanations, nor will the intelligent Reader need to have it pointed out wherein they are applicable to particular

cular Passages, because they will easily occur to the Mind from their natural Connexion with one another. Such Things only therefore call for Explanation, which do not necessarily flow from any of these Premisses, and which are often mentioned in the following Work.

And on this Distinction comes first to our Enquiry the *Lentor*, whereof our Author makes such frequent Mention: To which Purpose the Reader is desired to observe, that in many Places the Blood is spoke of as being too thick and too thin at the same Time, the thickest Part therefore in the *Bellinian* Sense is the *Lentor*; not unlike what is commonly observed in all Coagulations, wherein some Parts of the Fluid thus changed is rendred thicker, and others thinner than before: And a Fluid thus circumstanced is said to be *unequally* fluid, (a Term much used by our Author, both with Relation to the Blood and nervous Juice) that is, having some Parts apt to adhere in its Passage, and cause Obstructions in the finer Vessels, by their Grosness and Tenacity, while others are more susceptible of Motion, and flow through minuter Canals than before.

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But further, in some nice Circumstances we are taught to make a Difference between this *Lentor* and *Viscidit*y; that is, when the coagulated Part of the Blood, which ordinarily goes under both these Appellations, is rendred by Heat, or any other sufficient Cause, so destitute of Humidity, that it will not recede from its Figure upon any Impulses made against it in the common Course of Circulation, and animal Action; whereas while it remains under that Property which gives it *Viscidit*y, it hath yet so much Share of Humidity, and is so lax in its Cohæsions, as to admit of a Recedure from any Figure into another, on any ordinary *Impetus* against it: so that every *Viscidit*y may be deemed a *Lentor* in the Blood, although every *Lentor* is not *viscid*; and the Difference herein may easily enough be conceived by what obviously occurs when any adhæfive, or such like moist Substance, is by Heat dried into a more tough Nature, until it arrives even to a Degree of Friability. Yet although our Author in some Places uses the Term *Lentor* in this Sense, where *Viscidit*y does not so well express the Thing intended, yet for the most Part it is to be understood only of some Part of the Blood made thicker than

natural, and by no Means reaching to Consistence or Hardness, as may be seen particularly in Page 248.

Another Circumstance of this *Lentor*, on which our Author lays considerable Stress in some Places, ought thoroughly to be understood, and that is, when it is washed out of the capillary Arteries into the Veins, under a certain Degree of Viscidity, that shall in a small Quantity be not so easily propelled forward with the Current, as a *Lentor* otherwise circumstanced shall in a much greater Quantity; which therefore may be here thus further explained.

Suppose then a Particle of *Lentor*, to be propelled by the circulating Current towards the Heart through any Vein whatsoever; but that this *Lentor* is so firm in Consistence, that the *Impetus* made upon it will not change its Figure, it is then manifest the Impulse of every circulating Particle of Blood against it from behind, will strike it forward, or accelerate its Motion; and that much faster than when its Consistence will admit of a Recedure from its Figure upon such Impulse, because in Proportion to such Recedure will that Impulse be lost; and the more especially where a certain Degree of Adhæsi^on or Tenacity

is also the inseparable Consequence of such a Consistence. For by the known Laws of Circulation, the grosser or thicker Particles (supposing them also specifically lightest, which is the Case here) will be thrown toward the Sides of the Canal, by a greater Velocity at the middle of the Stream, and consequently will the Particle of *Lentor* be oftener struck upon on that Side towards the Axis of the Vessel than on the other, and that too with a greater Force; wherefore then a Particle thus circumstanced in its Consistence, as this is supposed to be, that will admit of a Change of Figure on the least Impulse, happens thus to float, it will be quickly struck out into a longer Form; and the more so too, because that Part next the Side of the Vessel will meet with some Retardation on every Contact therewith. And thus a *Lentor* comes to be spread along the Coats of the Vessels, as *Bellini* expresses, like a *fine Web*, Pag. 196, and 200.

This also explains to us the 193, and 194 Pages, where it is accounted for, why a lesser Quantity of *Lentor* in some Circumstances should be longer in its Course through the Veins than a much greater Quantity, under different Modifications; as the Reasons here must be manifest to every one of ordinary At-

tention, why a viscid pliable Particle will not be carried so fast along the Current, as one that is rigid and hard. And this also plainly accounts for that great Retardation of Motion in the *Lentor*, as it returns through the Veins, which is frequently made Mention of; and particularly in the XIX *Proposition*.

Hereby likewise the Reader will easily perceive the Difference between breaking the *Lentor* in its *transverse* and *longitudinal* Contacts, and the different Powers by which they are effected; and clearly discern the several Means, frequently enumerated by our Author, either of lessening or increasing the Blood's Viscidity, and of obstructing, or opening again the capillary Vessels. For suppose a Particle consisting of yet minuter Particles, cohering in those Surfaces on all Sides which are at Contact; it is plain that every Impulse from the propelling Current will rather strike them into closer Contact, as to their transverse Surfaces, (unless in such a Circumstance of Consistence as before mentioned, where the Inequality of Impulse, greater towards the Axis than the Side of the Canal, stretches it out into a Film or Web) and give the *Lentor* a greater Resistance to Separation, or a more tenacious Consistence; but an Impulse upon it from the Side of
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the Canal, in that Contraction which it has frequently and strongly while in the Arteries, divides those transverse Contacts, and facilitates their Separation from one another, in that Agitation as is made by a Composition of both these motive Powers.

Thus we come to understand how a less Quantity of a viscid *Lentor* shall be longer in shaking away from the Membranes to which it adheres, than a greater Quantity of a *Lentor* that is not so cohæsive or viscid in it self; and this chiefly for two Reasons, first, because the Contraction of the Vessel cannot make such a Separation of its transverse Surfaces, as to destroy or weaken that *Nisus* they have to mutual Contact; and secondly, because the preterfluent Current hath not so much Surface to strike against, when such Contraction thrusts it within its Reach, as will facilitate its Impulse in dividing it laterally, or by such a rotary Motion as is mentioned *Page 200.*

But what is of greatest Moment is hereby rendred plain, and that is, how it comes to pass that *Compression* may increase a *Lentor*, the Obstruction of an Artery, Entanglement of Heat, and a Perception of Cold; and likewise have Effects reverse to the whole; which Term is frequently made Use of

of for both; for it is hereby manifest, that in the first Acceptation is meant such Compression as arises from the Protrusion *à tergo* of the circulating Stream, which in a viscid Blood, and beginning Obstructions, will aggravate all the Symptoms of a *cold* Fit, by accumulating the Viscidity in the Capillaries, and inclosing the igneous Particles; but when such a Compression from a Protrusion of the Current internally, hath thrust out the Arteries to a Stretch wherein the *Nisus* of their Springs, or Endeavour of Restitution, exceeds the propelling Power, then will their Contractions, or Endeavours of Restitution, as in all elastick Bodies in the same Circumstance, re-act upon the accumulating Matter with such Force, as is sufficient to shake it away, to divide its Cohæsions, to let out the igneous Particles, and bring on all the opposite Appearances, which are the Affections of an *hot* Fit. When therefore the Terms *Pressure* or *Compression* are used in the former Sense, it is to be understood *that* from the circulating Stream; and when in the latter Sense, *that* from the Contraction of the Vessels. For although the Term is for both in many Places preserved the same, yet under these different Circumstances it hath contrary Effects.

And

And thus it comes in the clearest Manner intelligible, how that increased Contraction of the Arteries, so frequently mentioned in the XIX Proposition, and about the Beginning especially, shifts the Contacts of the inclosed *Lentor*, and in Concurrence with the direct Motion of the Current produces an Agitation, compounded of direct and transverse Impulses, which is by Degrees sufficient to break away the Obstruction, and in many Circumstances of Consistence and Cohæſion of the *Lentor*, to digest it into the State of natural Blood, or fit for Expulsion by Perspiration, or some other Outlet.

In the XIX Proposition, and some other Places, mention is made of a *Lentor* that is so dry, as to absorb from the Arteries so much Humidity, as destroys their Elasticity; which comes to the same, if the Reader understands such Dryness from the same common Cause, as gave the like Property to the *Lentor* it self; although it is not difficult to conceive how a very dry Matter adhering to their Coats should, as a *Stimulus* also to their more frequent and strong Contractions, occasion a greater Consumption of Humidity than is consistent with a Continuance of their Elasticity.

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The Reader will moreover frequently observe such Terms as dry, watery, &c. applied by our Author to the nervous Fluid; and which therefore we think necessary to take Notice of to such as are not accustomed thereunto, as signifying no more than that the nervous Fluid may, as all others of the same Denomination, be made up of Particles more or less endew'd with the Properties essential to Fluidity; and which will not be difficult to those who attend but to the obvious Qualities of such Bodies; for all Fluids whatsoever are made up of Particles in themselves as really solid, in Proportion to the Matter they contain, as those compounded of the most hard and constituent Bodies; but that a Collection of them makes a Fluid, is owing to their particular Figures, and Facility of Motion over one another; and in Proportion to the Aptitude of their Figures for Motion, and their Parts of Cohæſion, is a Collection of them more or less fluid: And as Humidity also is a Property resulting much from the same Mechanical Affections, which fits the constituent Particles to insinuate into, and adhere with any other Bodies, wherewith they come into Contact; so any fluid Body may be said to be
more

more or less moist, or said to be more watery or more dry, as its compounding Parts are more or less endued with such Properties.

Common Experience informs also, that a Collection of Particles may put on the Appearance of Fluidity, and answer in most Things to a fluid Body, which shall very little, or not at all, have the Quality of Humidity; Thus fine Sand, powdered Alabaster, and Quick-silver, are in many Respects Fluids, and yet have not one jot of Humidity, that is, have not the Property of wetting, or adhering to any Bodies, wherewith they come into Contact. As therefore the animal Fluids, and even the nervous Juice, which sometimes also goes under the Denomination of Spirits, are in some Measure compounds of different Particles, although all of them collectively constituting a Fluid, some of which Particles may be more fitted both for Fluidity and Moisture, and others for Fluidity only without the other Quality; according therefore to the different Proportions of these in the whole, will the compounded Juice be properly said to be more or less fluid, as also more or less dry. And as Water is the Standard of greatest Humidity, so any Fluid is said to be
more

more or less watery, according to its greater or lesser Participation of the same Properties; and the further it deviates therefrom, by abounding with Particles less adhæfive, more subtle, or more rigid, will it justly be termed comparatively dryer, hotter, or the like.

Thus much is hoped sufficient to give the Reader a just Apprehension of these Differences in the animal Fluids, and without it there can be but very little Advances made in any true Knowledge of the OEconomy; and the more particularly have we taken Pains to inculcate thus much here, because without it there can be no understanding the Writings of *Bellini*, either on the following, or any other Subject: And to a true Acquaintance with these Differences, in the compounding Particles of the Fluids, and the contractile Powers of the Vessels circulating them, may be ascribed the sole Foundation of physical Knowledge.

The Reader may perhaps find Difficulty in the *cold Ferment* which our Author sometimes mentions amongst the Causes of immediately running the Blood into a *Lentor*; but this will cease to be strange to any one who considers a Procedure of like Nature in many Instances; as all Acids, and Mixtures

tures abounding with saline Particles, do both immediately give a Perception of Cold, by deadening that Quantity of Motion in the sensory Organ, wherein its natural Heat consisted, and also coagulate every softer Fluid with which they are mixed, by curdling the lighter and more yielding Particles into a Grume, which is equivalent to our Author's *Lentor*, and rendering the other Parts thinner than before: And because such Mixtures brought into the Blood, whether from a sharp cold Air, which is known to abound with a nitrous penetrating Salt, or from Humours stagnating in the Glands, and turning therein acid, do give it Motions different from those of a natural State, they are properly enough termed Ferments; and as joined with a Perception of Cold, whether from their immediate Contact, or from their Consequences in producing a *Coagulum* or *Lentor*, they are also significantly called *cold Ferments*.

It is presumed needless to most Readers of Works of this Nature, to inform them, that by the Divisions of Fevers into *Quotidians*, *Tertians*, and *Quartans*, is to be understood such as return every Day, every other Day, or every third Day; for *Tertians* and
Quartans

Quartans are reckoned inclusively; in the former, taking in the two sick Days, with the well one between; and in the latter, the two sick Days, and the two well ones between. All other Subdivisions will from hence be easily enough understood.





O F
FEVERS.

The ANTECEDENTS, CONCOMITANTS, and CONSEQUENCES of every Fever.



SINCE it is our Intention here to be satisfied what a Fever is, it is necessary to enter on such an Inquiry by the same Steps as we come to the Understanding of any other Disease; that is, since by Physical Observations it appears what is peculiar to every Fever, what precedes, what accompanies, and what follows its several Kinds, in a Collection of all these together must consist the Nature of the Disease; and all these Antecedents, Concomitants, and Consequences, to every particular Fever, are first to be

set in View; whence the Necessity appears of finding out some Cause of all these Appearances, and the Manner of its Exertion; or, which is the same Thing, what is the real Nature of a Fever. Because therefore the Enumeration of these Feverish Attendants has no other Regard, than by them we may be carried on to their respective Causes, and the Means of their Operation, those very Affections ought distinctly to be proposed, without imagining or reciting any particular Cause, such as Putrefaction, Heat, an occult Quality, Poison, Fermentation, or any Thing like thereunto; but whatsoever may be their Causes, and their Manner of Operation, (all which shall be deduced in the subsequent Propositions) those Affections only are to be considered that are essential to every Fever, and are obvious to our Senses, that from thence we may be conducted to those necessary Causes, of which as yet we are in Doubt, and on Inquiry after. There is therefore no other Method in the Enumeration of these Feverish Affections necessary, but that they be severally recited as they appear in every Instance; and Putrefaction, Effervescence, with other Causes hereafter to be assigned, are not only needless to be joined to such Relations, but would be altogether foreign to our Purpose, and contrary to our Intention, which

which as yet only supposes some Cause, but what that is, leaves to Uncertainty, and future Inquiry.

If then we fix upon any Method in the Recital of these Affections, which indeed seems very little, if at all, necessary, we shall not however follow that which depends upon the most common and vulgar Division of Fevers, into an *Ephemera*, a *humoral* Fever, and an *Hectick*; because this supposes their respective Causes, as in the first an Accension of the Spirits or Blood, in the second a Putrefaction of Humours, and in the last an Accension of the solid Parts: For we would confine our selves under every Division of the Disease, to suggest nothing touching its Cause, the Knowledge of which is sought, as of a Thing yet altogether unknown, by an Acquaintance with those Affections of every Fever that occur to our Senses. But as it is our Desire to observe some Order in the following Searches, we shall confine the Enumeration of febrile Affections to two Distinctions only, which are obvious to the Senses, and are so far from any Supposition of a Cause, that they suggest not the least Hint that Way, and yet include an easie Division of all Fevers, so that there cannot happen any particular Case which is not reducible to one of those Heads: And these two Distinctions, obvious to the Senses, and

supposing no particular Cause, and to which all Fevers are reducible, respect only the Times of a Fever's Duration; for no one Fever can be met with, that does not at some Time or other totally terminate, or break into Intermissions and Returns; that is, there is no Fever but is either *continued* or *intermittent*; and these are two Divisions that are manifest to the Senses, and suppose no particular Cause, and yet include all the Kinds of Fevers that can possibly happen.

*All Fevers either Continued or Inter-
mittent.*

Let then a *Continued* and an *Intermittent* be the general Division, under which all particular Fevers are to be reduced; (for we cannot begin with the Definition of a Fever, because as yet we are supposed not to know what it is) and by a *Continuent* we understand that which never leaves the Patient through the whole Time of his being sick, or of which there is no distinct Termination within that Space, or no Intermission; (for all these are used by *Celsus*, *Lib. 3. C. 5.* to express the Time of the Fits Secession) but an *Intermittent* is that which within the Space wherein a Person is said to be ill, does for some Time leave the Patient free of it, or of which for some Time there is an entire Termination, or in which it altogether disappears.

What a Continuent.

What an Intermittent.

Because

Because therefore a *continued* Fever is that which never totally goes off during its whole Course, or that wherein the original and permanent Cause is totally exhausted by one simple Paroxysm; or so remains, that after one Circuit, it is still able to renew others before the preceding quite are off, either after a certain Interval of Time, or an uncertain one: If after one simple Paroxysm the whole original and permanent Cause is totally removed, and disappears, and upon a Removal of such a Cause the Fever ceases so as not at all to return again; this passes for a Fever of one simple Circuit, called a *Simple Continuent*: But if in this one Circuit the original Cause still remains, so as to excite other Fits or Exacerbations, before the preceding are quite off, and at stated or certain Periods of Time, it then becomes a Fever of many Circuits, and may be called a *Periodical Continuent*: But if its Exacerbations are not in any certain Quantity of Time, but return sooner or later, but yet before the preceding is quite off, it is a *Wandering* or an *Erratick Continuent*: But if the original and permanent Cause continues to excite new Paroxysms some Time after the preceding are quite off, an *Intermittent* is produced; and that a *periodical Intermittent*, if its Returns are at stated Times; but a *Wandering* or an *Erratick Intermittent*.

A Simple Continuent.

A Periodical Continuent.

An Erratick Continuent.

A Periodical Intermittent.

An Erratick Intermittent.

What Fevers
belong to Con-
tinuents.

tent, if those Returns are not at certain Periods, but happen sooner or later, before or after the Time expected. This therefore is all the Division of Fevers that our present Purpose requires, and this their Subdivisions; that is, every Fever is either *continued* or *intermitting*, and the *continued* is either *simple*, or *periodical*, or *erratick*; but the *intermitting*, only *periodical* or *erratick*: And from a Recital of the different Kinds of Fevers, it will immediately appear how they all come under this easie, perspicuous, and necessary Distinction.

For Instance: A *Legitimate Ephemera*, that finishes its Circuit in 24 Hours, or thereabouts, and goes off so as to leave no Cause of Return, is a *Simple Continuent*; an *Ephemera* of many Days is indeed longer, but then it is only one Circuit protracted thro' so much Time. An *imputrid Synochus*, (for here we are forced to use Terms for Want of better, which suppose Putrefaction as a Cause) or a *Simple Synochus*, or what is also called *Febris Inflativa*, is only one *Simple Continuent*, when it goes off so as not to return again. A *Putrid Synochus*, or *Febris continens*, differs from the foregoing in a greater Heat, and an Intension of all the Symptoms, but after one Circuit, the Patient quite recovers. A *Causus*, or a *burning Fever*, when it has no Periods, that is, without Return, differs from

from the two preceeding only in a yet more intense Heat, and extreme Thirst: And at last of all even a *Hectick* is of the same Class, when it is of one Course only, with equal Affections of Pulse, Heat, &c. unless when aggravated by Meals.

But to *Continuents* regularly recurring a *continued Tertian* is to be reckoned, since this consists of many Circuits, every one of which returns exactly on the third Day, before the preceding is quite off; and to this *continued Tertian* is reducible also the aforementioned *Causus*, since it has the same Types or Periods as a *Tertian*: And to this Head belongs the *Affodes* and *Elodes*, for the same Causes. A *continued Quotidian*, since this in like Manner consists of many Exacerbations, returning every Day at the same Time before the preceding quite ceases; and to this *continued Quotidian* some reduce, for the certain Coldness that attends it, an *Epiala*, the lesser *Syncopale*, and the *humoral* or *plethorick Syncopale*. A *continued Quartan*, since this also consists of many Circuits, which return every fourth Day at certain Times, before the preceding is quite off: And lastly, *malignant* and *pestilential Fevers* are for the most Part *Continuents*, with regular Exacerbations, altho' sometimes too they happen to be *Simple Continuents*, so as to be reducible

to both Classes, and even sometimes they are likewise of the *Erratick* Kind, as we shall have Occasion to observe hereafter: But all these Fevers are *Primary*, and called *essential* or *primary Continuents*, or *secondary Fevers*, which are accidental or symptomatick; and some are likewise termed *Concomitant*. The *Primary* are in themselves a Disease, and come not after any other Disease whereby they subsist: The *Symptomatick* subsist by another Disease from which they have their Origin: And the *Concomitant* Fever hath some other Disease joined with it, from whence it was necessarily produced, or with which it hath some common Cause. All these are alledged to be *Continuents*, (tho' I cannot see why they may not also be *Intermittents*, if they result from a Cause that periodically subsists) and to these are joined a *Phlegmonodes*, an *Erysipelatodes*, a *Typhodes*, a *Lypiria*, a *Lenta*, and the *Small-Pox* and *Measles* in Children.

*Intermittents, their
Sorts.*

To these succeed *Periodical Intermittents*, of whose Number is the *Intermitting Tertian*, consisting of many Paroxysms, every one of which returns every third Day at a certain Time, after the preceding hath been quite off: An *Intermitting Quotidian*, keeping to the same Regularity of Return every Day, after the preceding Fit had been off for some Time: And an *Intermitting Quar-*
tan,

can, orderly returning every fourth Day, some Time after the foregoing Paroxysm was quite gone.

Both *continued* and *intermitting* Fevers ^{Legitimate,} are either *legitimate*, *entire* and *true*, or ^{and spurious} *spurious*, and of the *bastard* kind; to ^{Fevers.} the former belong all Affections, and no other, but what are proper to some Kind of Fever; but to the latter only some of those necessary Affections, joined with what concerns also other Diseases. But we shall not here distinctly consider the *spurious* Kinds amongst those Affections that properly belong to Fevers, nor mention them in the following Propositions, because they will be easily understood from a right Knowledge of the *genuine* Fevers. Yet from hence it may by the Way be observed, that no *spurious* Fevers, which can be reduced to any certain *Genus*, will be omitted under some or other of the following Divisions.

Furthermore, sometimes both *simple* and *periodical* Continuents, as well as *Intermittents*, are confounded with one another; that is, more Fevers of the same or of different Kinds may afflict a Person at the same Time: As more *Simple Continuents* than one; more *periodical Continuents*; more *Intermittents*, either *periodical* or *erratick*; or *Simple Continuents* and *Intermittents* confused, may begin and terminate so near the same Time, as to be scarcely discerned.

Also

Also both shall keep its proper Affections, and neither prevail; or one shall change the other into its own Kind, or communicate to that somewhat of its own Nature; And by this they are distinguished from *spurious* Fevers, which participate of the Nature of many together, and take their Denomination from that which prevails, as a Mixture does from that Element which is most conspicuous in its Composition.

*Compounded
Fevers.*

Fevers are said to be *compounded*, when there subsists more than one at a Time; and they are evidently distinguished into such as are compounded of one Sort only, which take their Denomination from the Numbers concerned, two, three, &c. or *double, triple, &c. Tertian, Quartan, or Quotidian*; but when they are compounded of different Kinds, they are destitute of any proper Appellation, except that which is compounded of an *intermitting Tertian*, and a *continued Quotidian*, which is wont to be called a *semi-tertian*, or a *Febris Horrida*. When these Fevers are so compounded that one goes off as another comes on, they are called *Subintrant*; when one comes quickly after another is quite gone, *Coaltern*; but where one immediately takes Place after the Disappearance of a preceding by *Avicen*, it is called *Communicant*.

We shall not therefore hereafter, in the Enumeration of different Fevers, or in our Propositions, distinctly treat of those which are compounded; for whatsoever in them requires Demonstration, will be altogether found under those Fevers of which they are compounded: Only somewhat concerning a *semi-tertian* ought to be said, because there are in that what ought not to be omitted; and here also by the Way it may be observed, that in compound Fevers there cannot be constituted any particular *Genus*, which will not be touched upon in the proposed Method.

Lastly, It appears from their very Appellation, that *Wandering* or *Erratick* Fevers may be both *Continuents* and *Intermittents*; and for the same Reason also *Malignant* and *Pestilential*, which *Malignant and pestilential Fevers.* keep to no Certainty of Access, Termination, or Circuit, to no certain Form of a Fever, but repeat their Exacerbations sooner or later, oftener or seldomer, or for longer or shorter Times; and ending sometimes hot, and at others cold, with many Irregularities of like Nature, not reducible to any Standard; yet neither in these is there any Thing of Moment shall be omitted, and even the *Erratick* will be easily cognizable under some particular Divisions.

Because

Because therefore the Species of Fevers which we have reduced to *Continuents* and *Intermittents*, is supposed as much as is given to a skilful Physician to be acquainted with; and that their subordinate Divisions are in Conformity to those Affections which our Senses discover, nothing being suggested about their Causes, or Manner of Exertion: This Method seems most requisite, that in their proper Order may be recited the *Antecedents*, *Concomitants*, and *Consequences* of every particular Fever, about whose Origin and Nature we would be informed; it now behoves us therefore to follow such a Method, which the preceding Division leads us into, and consequently in the first Place to explain the Affections of *simple Continuents*, then *periodical Continuents*, thirdly, *periodical Intermittents*, and lastly, *continued and intermitting Erratics*; and what these singly are to investigate under several Propositions. Proceed then to the Work it self.

The

*The ANTECEDENTS, CONCOMITANTS,
and CONSEQUENCES of simple conti-
nued Fevers.*

*Of a Legitimate Ephemera, by the Greeks
called πυρετὸς ἐφήμερος.*

ANTECEDENTS. Sadness, Fear, Anxi-
ety, Anger, Watching, Trouble of
Mind, Evacuation, Exercise, any Excess,
Pain, Hunger, Thirst, hot Meats and
Liquors, Drunkenness, Crudity whether
from too much or too little Heat, Heat
of Weather, much sitting by the Fire,
or in the Sun, or in hot Baths, a dimi-
nished Perspiration, Things too cold, or
too astringent, as alluminous Baths, and
the like: Inflammations of the Glands,
or Bubo's, especially when they suppo-
rate, a hot and dry Constitution, too
much Sleep, a Retention of Vapours,
Stools, and Urine; Inflammation of the
extreme Parts, and a Plethora.

CONCOMITANTS. The Beginning from
some procatartick Cause, that is evident,
manifest, and immediately raising the
Fever, by a Diminution, for Instance,
of Perspiration, &c. the Urine at first
in Substance, Colour, and Contents, near
to that of well Persons, sometimes crude
and whitish, afterwards a good Sediment,
or a Cloud, Respiration great and fre-
quent, Heat and Pain of the Head, the
Pulse

Pulse not much differing from a natural one, only sometimes greater, swifter, and more frequent, sometimes also weaker, but always without any Inequality; and when the Fever ceases, soon coming again to its natural State, without any Return of Disorder, as it often happens in other Fevers; the Heat sometimes greater than natural, and more troublesome, but moderate and easily supportable even in the Heat of the Fit; its Accession without Cold, Rigor, Horror, Yawnings, Stretching, or sometimes with a slight and short Horror; an easie and equable Increase of the Heat and the Pulse: Its Declination, by *Celsus* called *Seccession*, is with a Moisture and humid Vapour, like the Sweat of well Persons; after which there will be a total Cessation of the Fever, or, as the same Author has called it, a perfect Termination, with an Increase of Colour in the Urine. From Anger, arises a Pulse that is high, quick, and strong, and the Heat is not acute, but diffused and moderate. From Grief, the Pulse is low, sluggish, languid and slow, and the Heat is intense rather than diffused, the Body emaciated, the Eyes hollow, and a total Change in the Complexion. Like to this is that from Disquietude of Mind, but with a lesser Degree of Waste, and sinking of the Eyes, and Discomposure of Countenance. From Watching, the
Face

Face is moister, the Motion of the Eyes more heavy, a more difficult raising the Eye-Lids, and on those also will their rise some Moisture. If the Patient hath been wearied with too much Labour, the Skin is drier till the Height of the Fit, but after that, in those who have not been over-wearied, a transpirable Moisture rises from the very inmost Parts, and covers the whole Surface with a Dew; but in those who have been extremely exercised, a Dryness remains upon the Skin, even to the Declension of the Fever. From Adstriction, the Skin is harder, more compact, and the Heat moderate to the Touch; but in the Progress of the Distemper, the Heat grows more intense, the Urine higher coloured, without any Hollow-ness of the Eyes, or Extenuation of the Body. From Buboes, the Pulse is high, swift, frequent, equal; the Heat great, but tolerable, and a Redness of the Face. From a *Plethora*, there is yet a higher Colour in the Face and Eyes, the Urine is redder, the Pulse great and swift, and the Fit lasts 24 Hours, more or less.

CONSEQUENCES. A *Simple Synochus*, or a *Synochus continens*, or an *Hectic*; especially in the young hotter Constitutions in the Spring-Time, and of a foul Habit: But what Fevers are subsequent to this, their particular Affections will dis-

discover, and they will be also foreknown by the particular Symptoms of the Patient before the *Ephmera* it self is quite off; and some of those Fevers already enumerated will arise after an *Ephmera*, if after 24 Hours there yet continues a Pain in the Head, and that continues for as long Time further without any Appearance of Sweat.

An Ephmera of many Days.

ANTECEDENTS. The same as in an *Ephmera* properly so called, but more aggravated; Obstruction of the Skin, Repletion, Debauches, Catarrhs, Buboës.

CONCOMITANTS. In like Manner the same, but their Continuance for many Days without Intension or Remission.

CONSEQUENCES. Likewise the same in all Respects.

A Simple Synochus, or that Fever called Inflativa.

ANTECEDENTS. The same as in an *Ephmera*, but especially a diminished Perspiration, and chiefly of hot Steams, a Fulness of the Blood-Vessels, or a *Plethora ad Vasa*, with a Hardness of the Flesh, the Spring Season, Youth, too plentiful a Use of Wine, Meats over-nourishing, a Suppression of the *Hæmorrhoids*, *Menjes*, or any other Flux, which

which Nature either requires, or is accustomed to.

CONCOMITANTS. The same as with an *Ephmera*, but more apparent, and more aggravated; the Heat tolerable, but greater; the Skin not dry, but covered with Moisture; Urine like to what is natural, but thicker and redder; the Pulse vehement, swift, quick, full, large, and equal; the Face and whole Body red, and as it were inflated; the Veins stretched and tumid with Blood; a Weariness with Stretching; Heaviness of the Head; Difficulty and Quickness of Respiration; Sleep for the most Part sound, but disturbed with the Appearances of Things red; a beating of the Temples; Straitness of the Breast; and great Restlessness. A Duration of all these for three, four, or more Days, even to the seventh, without Remission; and through that whole Space the Heat is equable, or of the same Height, and the Fever is called *Homotonos*, or *Acmaistica*; or it continually encreases, and is called *Epacmaistica*; or it continually decreases, and is called *Paracmaistica*. It is terminated either by Sweat, or by a *Hemorrhage* at the Nose.

CONSEQUENCES. As to Fevers, the same as after an *Ephmera*, and with great Fulness, which, if not lessened by medicinal Helps, ends in a Phrenzy, a

Pleurisie, or somewhat of the like Nature, that is caused by too much Blood.

A Putrid Synochus, or a Febris continens.

ANTECEDENTS. An Obstruction of the Skin, Liver, and other internal Parts, from gross and viscid Humours; too great a Quantity of Blood; Youth; Spring; a Suppression of natural, or accustomed Evacuation; a bilious, or a sanguine Constitution; much Labour and Exercise; much vexing Cares; a long Summer's Heat; and a long Use of Diet or Medicines, that are hot, drying, and apt to encrease Choler.

CONCOMITANTS. The Accession without Cold, Horror, and Shivering; the Heat considerable to the Touch, but less troublesome and burning than in periodick Fevers, but greater and more enflamed than in the *Simple Continents* already explained; in its Progress from the first Accession to its final Termination, it either decreases in a certain Proportion, or continually decreases, or continues at the same Height, and the Course of the first Day generally shews which of these Ways it will take: That which keeps up to the same Degree of Heat is called *Homotonos*, or *Acmaistica*; or decreasing, as in a *Simple Syno-*

Synochus, Paracmastica; or continually encreasing, *Anabatica*, or *Epacmastica*; no new Accession or Exacerbation; the Pulse great, vehement, swift, frequent, unequal and irregular; the Urine thick, turbid, without Sediment, and crude or slightly digested at first; sometimes also a Pain in the Head; Inquietude; Watching; Thirst; the Urine thinner; sometimes a Difficulty of Breathing; Inflation, and Swelling of the Belly; black Pustules, or livid: the *genuine* last seven Days, the *spurious* fourteen.

CONSEQUENCES. If the Urine is red towards the Accession, it generally ends in Recovery, and that soon; but where it is whitish, for the most Part in Death. If it be a long Time protracted, it often brings on an Asthma, or *Causus*, Inflammation of the Lungs, Hemorrhages, a Running or Tickling at the Nose, Flashing before the Sight, and a Heaviness upon the Countenance.

A Causus, or a burning Fever.

ANTECEDENTS. Whatsoever intensely dries and heats; a hot and dry Temperament; Youth, or a ripen'd Age; a hot and dry Temperature of Air; the burning Heat of Summer; immoderate

A Causus, or a burning Fever.

derate Labour; long Watching; Debauches of Wine; Anger; Thirst, &c. And *Hippocrates* says, that a *burning Fever* after great Pains in the Bowels is fatal.

CONCOMITANTS. A burning Heat, constant and perpetual, without any Exacerbations, and an inextinguishable Thirst, although the Patient drinks never so much; which two are the chief and constituent Symptoms, and both of them more intense in a *genuine Causus*, than in a *spurious* one; the Tongue dry, hard, and black; Gripping of the Belly; black Stools; Restlessness; a quick and difficult Respiration, with a loud Breathing though the Mouth open; Tossing about in Bed; a hard and very swift Pulse; and a Flame-coloured Urine. The *genuine Causus* goes off about the seventh Day for the most Part, but the *spurious* not till the ninth, eleventh, or fourteenth Day; and they terminate with a Looseness, Sweats, Vomiting, Abscesses, or the like.

CONSEQUENCES. Death most commonly in People of an advanced Age; as also those who are seized in the Air, the Temperature, Time of the Year, and other Circumstances abounding with Cold; an *intermitting Quartan*, especially after the Autumn Fevers.

AN
An *Hectick*.

A hot and dry Constitution of the solid Parts is called an *Hectick*; and when it wastes only their dewy Moisture, it is then said to be an *Hectick* of the first Degree; when it wastes the fleshy Substance and Fat, as *Galen* affirms it to do, of the second Degree; when the Membranes and Fibres, which *Galen* calls *Species Solida*, and others *Gluten*, it is of the third and highest Degree. Hence an *Hectick* is of two Kinds, *with a Consumption*, and *without one*; *without*, when the Moisture of the Parts is not wasted; but *with one*, when their Humidity is wasted and dried away; and then it comes to be called an *Hectica Marasmodes*, and its utmost Height is a natural *Marasmus*, or what the *Latin* Writers call *Marcor*, and it is that very same natural Decay of a living Body by Means of Dryness, with which all old People die, and is essential to the utmost Term of Age: From the like Property of Dryness does an *Hectick* go on to its most fatal Height, which does not kill by Dryness and Coldness, but by Dryness and Heat together. It is called an *Hectick κατ' ἔξιν*, *juxta Habitum*, or habitual; that is, one which is so fixed, that it subsists

of its ſelf, and has the Courſe of its Continuance ſubſiſting in the very Parts themſelves, and waſting them, and ſtanding in need of no adventitious Cauſe whereby it may be kept up: Whereas other Fevers are pronounced *per ſe*, or *Schetica*, that is, in ſome Diſpoſition which requires an Occaſion of Exertion, and a Cauſe without which no Fever would be raiſed.

ANTECEDENTS. Whatſoever can waſte the greateſt Part of theſe Humidities which are in the Solids, or raiſe a great Heat, or both, and a Diſpoſition to receive thoſe Impreſſions; thus conſtant and large Evacuations by Stool, Urine, or Sweat, Ulcers in the Lungs, Breſt, Womb, Reins, &c. Fasting, Labour, Grief, the Waſte of burning and acute Fevers, as alſo others of long Duration, an hot Conſtitution of Body, and an hot and dry Conſtitution of Weather or Climate, Debauchery, or Madneſs, will bring on this Waſte.

CONCOMITANTS. A Heat ſo much without Pain and Uneaſineſs, that a Perſon perceives not himſelf to be Feveriſh; that at firſt is gentle, but afterwards more intense and enflamed, and more ſenſible in the Arteries than any where elſe; its Increate after eating, at what Time ſoever it be, and whe-

whether every Day observed the same or not, and a Continuance of its Intension all that Time the Chyle is in Distribution, and after which the Patient returns to his wonted Temper, and so continues till after another Meal; with the Heat, the Pulse is also changed, and becomes higher and quicker during the Intension of that; and it also returns to its usual Condition some Time after Eating, that is, low and quick. These Changes happen without any Cold, Horror, Shivering, Yawning, and all those Symptoms which are common in the Accession of all other Fevers; and these Changes of Heat, and the Pulse after Eating, are proper only to, and inseparable from an *Hectick*. At other Times the Pulse is low, and moderately quick; the Urine of a Colour like to what is natural, with a continual Decrease of Strength, Extenuation and Dryness of the Body. But when it is come to its second Degree, a yet greater Dryness and Debility; the Pulse more weak, less quicker and harder; the Urine oily, with a Sort of Fat swimming upon it like a Cobweb. And yet in the third Degree all these Symptoms are aggravated, and attended with intense Dryness. Moreover, since in general an *Hectick* is attended with an

C 4

Heat,

Heat, at first moderate, but afterwards intended; with Dryness, Lifflesness to Exercise, and a Difficulty in Motion; this Fever may be ranked with *periodick Ephemera's*, both *continued* and *intermitting*; and it may be known by the especial Symptoms of each, easie enough to be discerned.

CONSEQUENCES. To the first Degree succeeds the second, unless that is first cured; and unless the second Degree is cured, (for some affirm that the second is curable) that is succeeded by a confirmed Consumption, a *Marasmus*, and inevitable Death.

The ANTECEDENTS, CONCOMITANTS,
and CONSEQUENCES of continued
Periodick Fevers.

A *Synochus*, or a *continued Periodick* Fever, is of such a Nature, that it never comes to an entire Termination, or to a total Cessation of the Fever, before a new Exacerbation; and it takes various Names, as those Exacerbations return sooner or later, in two, three, or four Days: But there is no Horror, Shaking, or Cold, precedes its Fits, nor do they terminate with Sweats,

A Periodick Tertian.

ANTECEDENTS. All those Things which dispose to a more intense Heat, a Redundance of Bile ; a hot and dry Constitution, whether of any particular Part, or of the whole Body ; Youth ; hot and dry Diet ; Fasting ; too sparing Nourishment ; frequent and violent Exercise ; Heat of the Air, or Climate, whether from the Season of the Year, Sun, Bath, &c. Suppression of bilious Evacuations ; too much Watching ; Trouble of Mind ; and the like.

CONCOMITANTS. Burning Heat, and Thirst ; Watching, or little Sleep ; frightful Dreams ; Deliria ; Bitterness in the Mouth ; a dry and black Tongue : The Exacerbations without any preceding Cold, Shivering, &c. the Secessions without Sweat ; the Pulse in the Accession, depressed, contracted, and as it were lost, small, quick and unequal, so that one Pulse is higher than another, and then swift and quick ; the Urine fiery, red, sharp, and in the Beginning crude without Sediment ; Nauseousness, bilious Vomitings and Stools, and great Restlessness, with Uneasiness of Mind.

CON-

CONSEQUENCES. Principally an *intermitting Quartan*, especially if the *Periodick Tertian* continues till Autumn.

Causus, what. A *Causus* also belongs to a *continued periodick Tertian*, since it observes the same Types, and keeps up to as great a Heat; but of this we have already spoke: Also a *Colliquant*, or

A Colliquative Fever.

Colliquative Fever, which is attended with the utmost Heat, that runs into Fusion the Fat, Flesh, and Substance of the solid Parts, exhaling them thro' the Skin in insensible Vapour, or expelling them by Sweat, Urine, or Stool; and herefrom happens a sudden Emaciation of the whole Body, and a Consumption, hollow Eyes, fallen Temples, a sharp Nose, Stools that are greasy, fetid, slimy, cholerick and frothy; the Urine also greasy like Oil: Under this Class comes likewise

Affodes, and the *Affodes*, wherein there is a continual Tossing about, and grievous Restlessness, for the most Part a Nauseousness at Stomach, and Vomiting, a gnawing Irritation at the upper Orifice of the Stomach, and its Membranes:

Elodes, what. And last of all the *Elodes*, which is continually attended with profuse Sweats.

A continued Periodick Quotidian, called Latica, because it is attended with an inward latent Heat.

ANTECEDENTS. Age; a moist Constitution; Infancy, Sucking Children, and such as have not yet bred their Teeth; old Persons of a corpulent Habit, and given much to Inactivity; Intemperance, and much Sleeping; damp Countries and Climates, and like Seasons.

CONCOMITANTS. The Heat at first Touch seems moderate, then intensely persevering from one to another Accession, and this chiefly about Evening, without any Cold, Shivering, &c. and its Decrease without Sweat; the Pulse slower, more unequal, and lower than in other Periodick Fevers; and in the Accessions yet more low and sluggish, and so depressed, as to appear almost quite lost. The Urine in the Beginning of a Fit is crude, then thicker, and less fiery and red than in other *Periodicks*; the Thirst is also less, unless the Patient abounds with Salt Juices; the Countenance a little bloated, flaccid, and wan; Doziness; Inappetency; phlegmy Excretions; and it lasts long, so as not to terminate seldom sooner than

than 40 or 60 Days, and sometimes it continues longer.

CONSEQUENCES. This Case is terminated by Sweats, Stools, or Abscesses, as also by the Parotide Glands; and is often followed by a *Cachexy*, *Dropfy*, or an *Hectick*.

An Epiala,
what.

To this Fever belongs the *Epiala*, either *ἐπὶ τῇ ἡμέρᾳ*, because it is slow and gentle; or from its Rigors, by the *Atticks* called *ἡπιάλα*, and under that Appellation in *Galen*, wherein every Part of the Body is affected with Heat and Cold at the same Time; but not as it is taken by *Avicen*, and the *Arabians*, according to whom, through the whole Course of the Fever, the inner Parts are cold, while the exterior are hot. Some reduce this to the Class of *Intermittents*; others to *continued Periodicks*; and others to *symptomatick* Fevers: And they say that it ought to be ranked with a *Periodick Quotidian*, because of the Cold which attends it, and must proceed from Phlegm which does not yet putrifie; and because of its Heat also, which is in like Manner from Phlegm in a State of Putrefaction; which Heat and Cold both subsisting in this Disease is witnessed by the Sense of Feeling. Hence likewise the same Persons affirm, that the Origin of this Disease is in a putrid Phlegm, or

a Phlegm just passing into a State of Putrefaction.

Hereunto also is reduced the *Synco- Syncopalis, ei-*
palis, which is of two Kinds, though ^{ther}
both belonging to the putrid sort;
the one *humoral*, or *repletive*, attended *humoral*, or
with a Redundance of crude and
phlegmy Juices, with a Sinking at the
Stomach, so that the Patient falls into
Syncope's, especially on the Fit's Acces-
sion, a great Dejection of Spirits, and
a little, weak, and unequal Pulse:
The other is a *Syncopalis Minuta*, or *Syncopalis Mi-*
the lesser *Syncopalis*; and this is attend- ^{nuta.}
ed with a thin, sharp, ichorous Hu-
mour, but so corrupt and tainted, that
it affects the Orifice of the Stomach,
and occasions a *Syncope*.

A continued Periodick Quartan.

ANTECEDENTS. All those Things
which generate viscid, cold or earthy
Juices; a dry, lean Habit of Body;
a dusky, obscure Complexion; a cold
and dry Temperament; a declining
Age; Autumn; great Irregularity in
Living; much Care and Anxiety; a
Suppression of the Hemorrhoids, and
a tumid Spleen.

CONCOMITANTS. Heat, every fourth
Day aggravated without any preceding
Cold or Quaking, and declining with-
out

out Sweat; in other Respects agreeing with an *intermitting Quartan*, unless in the Beginning the Pulse is less, slower, and more depressed, and afterwards more high, full, swift, and unequal, than in an *Intermittent*, and more enflamed at the Height; the Heat is more moderate than in a *Periodick Tertian*, and more intense than in a *Quotidian*; the Thirst is middling between that of a *Periodick Tertian* and *Quotidian*.

CONSEQUENCES. An *Intermitting Quartan*, a *Cachexy*, and a *Consumption*.

A Malignant Fever, and its several Kinds, viz. Morbus Hungaricus, Sudor Anglicanus: A Malignant Fever with Spasms, a Malignant Catarrh, and Malignant Epidemical Cough, see in Physical Writers.

ANTECEDENTS. Vitiated and depraved Humours accumulated in the Body from a bad Diet, subject to Corruption; a naturally depraved Constitution, easily falling into such Circumstances; and whatsoever is able to corrupt the Juices, and change them into a poisonous Nature.

CONCOMITANTS. A Species of some benign Fever, and such a gentle Heat, that at first there is no Suspicion of a worser Sort; but a little after there is a sudden Decay of Strength without any manifest Cause, and a greater Degree of Inquietude and Sweating, than could be expected from such a Fever, and such Heat. The Pulse is frequent, low, and very weak, sometimes like a natural one; yet with Inquietude, Anxiety, and all the worst Attendants, whence such a one is always the worst; sometimes at the Beginning of the Fever it is what is called a *Pulsus Formicans*, very small, very quick, and very changeable. The Urine at first is like that of well Persons, although attended with other bad Symptoms, sometimes thin, crude, without a Sediment; or if any Thing falls to the Bottom, it is more like an Excrement, than a settling from the Urine; sometimes thick, coloured, and turbid, with a thick, red, turbid Sediment. The Heat in Comparison to that of a *Causus* is less, although when at the Height in those Fevers, and very burning; but the Symptoms are much more threatening than in a *Febris Ardens*, and the Heat, to what might be expected in such Circumstances, not so intense. The Thirst is sometimes beyond the Measure

sure of the Heat, and sometimes none at all when the Fever is very high, with a Dryness of the Tongue, and a peculiar sort of Inappetency, or Loathing of Victuals, so that it seems some nauseous Medicine; with Vomiting also at the Beginning of the Disease, and frequent Shivering, which sometimes returns many Times in a Day at great Uncertainties. The Body seems very heavy, and the Limbs are quite useless; Delirium; Pain in the Head, shifting from one Place to another, sometimes in the Forehead, at others in the hinder Part; other Parts likewise are troubled with a fixed or a wandering Pain; Sweats frequent, small, and of no Service in the Beginning of the Disease; the Eyes often happen to look red, and the *Measles* and *Small-Pox* to break out, but much more in the Face, Hands, and Feet, than any where else; also Purple Spots, and those resembling a Flea-Bite, but these appear most on the Back and Breast, and less on the Face, Arms, and Legs, where there are sometimes none at all. The Face looks ghastly, strangely changed from its natural Complexion, and loses all its vivid Lustre and Spirit; and sometimes again comes to its natural Hue, and looks brisk and florid. Dozing, or Watchfulness; Loss of Memory; strange

strange Appearances; frightful Dreams; Confusion; Swimming; Tremblings; Convulsions; Inquietude; Anxiety; Dimness of Sight; Deafness, and Ringing in the Ears; Loss of Smell and Taste; Heart Burn, and an unquenchable Thirst; Nauseousness; and Worms from the Bowels, through the Mouth and Nose; loose and fetid Stools; Distillation of Blood from the Nose, especially at the Beginning of the Distemper; Swellings in the Neck, and about the Groin, that are difficult to cure, and which very often turn in again; the Tongue dry, rough, and black; the Mouth bitter; the Extremities sometimes cold, and suddenly burning hot; and in short, there is nothing bad that does not some Time or other happen in a malignant Fever; Spots, or Pimples of a purple Colour like Lentils, or resembling a Flea-Bite, as sometimes also of a violet, green, black, or livid Colour, and sometimes large like a Wale, or Mark left by a Blow, also of a livid Colour, as also at other Times very large, and covering most Part of the Arms, Legs, and Back, but these of a redder Colour; but when they are simple Spots, they do not rise above the Skin, but only discolour it: But indeed the *Small-Pox* are Pustules which suppurate; and

Of the Plague, or Pestilence.

*The Spotted
Fever.*

the *Measles* a lesser Kind, which lie rough only upon the Skin, and ne'er come to Suppuration. A Rash likewise sometimes breaks out in prominent Pimples which suppurate. The Fever which is thus attended with Spots, is called *Febris Petechialis*, or, the *Spotted Fever*.

CONSEQUENCES. A Pestilential Fever; for malignant Fevers at first private, grow popular and infectious, killing most whom they seize.

Of the Plague, or Pestilence.

A Plague and a Pestilential Fever are not the same Thing, or is the Plague always attended with a Fever, for according to physical Writers there are Plagues without Fevers: But when a Plague is joined with a Fever, it has its *Antecedents*, *Concomitants*, and *Consequences*, as any other Fever. A Plague differs from a Pestilential Fever, as the *Genus* does from its *Species*; for a Plague in general is a common Disease, or popular and contagious, killing most it infects; and all contagious Diseases that do so are called pestilential; where by the by it is to be noted that all popular Diseases are,

1. *Sporadick*; when many Diseases reign in the same Place at the same Time.

2. *Eu-*

2. *Eudemick*; when the same Kind of Distemper seizes many at the same Time in the same Place; and hath its Rise from somewhat that is familiar and natural to that particular Region: Or *Epidemick*; when the same Disease is translated from another Country, and infects many together in the same Place; and none of these popular Diseases are deemed pestilential, unless it carries off a great many, and is contagious; when amongst the *Greeks* it is called *Limodes*, which is the true Pestilence or Plague.

ANTECEDENTS. A scanty Diet; an Air corrupted either by some Fault in the Place, by Winds or Tempests changing from their natural Courses; Contagion brought from some other Place; venomous Exhalations from the Earth, upon Earthquakes, or sinking Pits, &c. sometimes just before its Seizure precede Epidemick Diseases of one Kind or other, as the Spotted Fever, Small Pox, Measles, Dysentery, Pleurisie, &c. or the Small-Pox and Measles, not only amongst Children, but grown Persons, Carbuncles, Buboës, great Want of Necessaries, and even a Famine, which Plague by the *Greeks* is called *ἡ λιμὸς μετὰ λιμῶν*, Plague after Famine.

CONCOMITANTS. A sudden Dejection of Spirits, and great Feebleness; but the animal Faculty is said to continue to the last Period of this Disease, as also the natural is sometimes not greatly damaged; the Contagion seizes a great many, and most of them die, and it is communicated either by real Contact with an infected Person, or by something exhaling from thence that participates of the Infection, and is inseparable from it. With the forementioned Sinking of the Spirits, there is joined Palpitation of the Heart, Syncope's, and the utmost Inquietude, that the Patient cannot rest in Bed, but tosses about, and continually changes Place; and such Decay of Strength is not from any manifest Cause, as large Evacuation, Watching, Grief, &c. The Pulse is low, small, quick, and unequal; the Heat is intense, sometimes inwardly, at others more externally; but the inward is much the more intense, and the other sometimes so little, that the Nose, Ears, Hands, and Feet, are not at all, or very little hot; whereas by Reason of the internal Burning, they are not able to endure any Cloaths or Covering. A Rash that is red, pale, black, livid, or other Colours, with Buboës and Carbuncles; all which
taken

taken separately even from the Rash to Carbuncles, do not prove the Disease to be a *Plague*, unless it hath also the other *Antecedents* and *Concomitants* of it; nor indeed is every Carbuncle a certain Indication of a *Plague*, but only that which depends upon, and is joined with the Causes of That. But when the animal Faculty is also affected, there ensues a Delirium, Loss of Memory, continual Watching, Dozing, Lethargy, an Aversion to see Light, Singing in the Ears, Deafness, Tremblings, Convulsions, Stammering or Lispings, and an Inaptitude to move the Tongue, without great Difficulty; sometimes also Nauseousness, and Vomiting. The Urine is sometimes clear, and at others turbid, as if Flower was in it, mostly of a Colour that is livid, or like Lead, sometimes fetid, and at other like that of well People: The Sweat is sometimes profuse, and fetid, at unexpected Times, sharp, and sometimes cold, and a dropping of Blood from the Nose. The Stools are fetid, ill coloured, and for the most Part small in Quantity; some are slimy, white, yellow, green, and not very thin in Consistence, but always fetid: A great Dryness, and Roughness of the Tongue; the Eyes without Brightness and Life, and big with Tears;

Symptomatick, or Secondary Fevers.

the Breath stinking, as also the whole Body of an ill Savour; an Appearance of a stinking Relish in every Thing taken into the Mouth; Heart-Burn, and Hiccup. Various Blotches and Ulcers upon the Skin, resembling an Erysipelas, Inflammations, Tetters, Leprosie, and Scabs; its Duration for one Day, three, four, five, seven, nine, and sometimes it is protracted even to the fourteenth Day.

CONSEQUENCES. Generally Death, after which break out upon the Skin Spots of divers Colours, like to those who die of any virulent Poison.

Symptomatick, or Secondary Fevers.

Hitherto we have treated of *primary continued Periodick Fevers*, which depend not on any other Disease, but come from a distant Cause, and are of themselves a Disease. There are other *Continuents*, that are *symptomatical* or *accidental*, as depending upon some other Disease, from whence they necessarily flow, as a *Phrensy*, *Pleurisie*, &c. and a Fever arising from Inflammation of pure Blood is termed *Phlegmonodes*; from an Erysipelas, *Erysipelatodes*; from an Inflammation of the Liver, *Typhodes*; and so of all others. Of this Class is the *Lypiria*, wherein all the inner Parts
burn,

burn, and the exterior are cold ; the Burning Fever, and that which is from any vehement Inflammation of some inward Part or *Viscus*, attended with a small, quick, unequal Pulse. Hitherto belongs the *Slow* Fever, from a latent Obstruction, or Putrefaction, or Corruption of some *Viscus*, a Fever the most mild of all, without almost any Symptoms, so that the Patient seems not to be sick, unless from some Variations in the Urine and Pulse ; the Strength indeed of the Patient declines, that he can hardly walk upon his Legs ; he is nourished by no Diet, but lingers and wafts continually, and he often continues 40 Days or more. The like *Slow* Fever attends *Cachectick* Persons, and *Leucophlegmatick* Girls, in whom it is called the *Febris alba*, or *white Fever*.

A Symptomack Fever also proceeds from Milk corrupted in the Stomach of Children and Infants ; the same from extravasated and putrefied Blood ; the like from Worms, but joined with a Thousand other Symptoms, Delirium, Loss of Memory, Convulsions, Faintings, Disorders in the Sight and Hearing, Watchings, grating the Teeth, biting the Lips, sighing and crying in an unusual Manner, picking the Nose, and a strange Itching there, great

Inquietude of Body, and variously changing into Anger, Inconstancy, &c. the Pulse small, weak, depressed, unequal, and hardly to be discerned; sometimes nauseating Food, at others of a canine Appetite, and all this while great Wasting of the Flesh with Vomiting, Nauseousness, great Thirst, the Stools sometimes hard and dry, but oftener loose and thin, the Urine frothy, white, thick, and always disturbed, cold and fetid Sweats, frothing at the Mouth in Time of Sleep, the Lips moist in the Night, but dry during the Day-time; a stinking Breath, as if from Vinegar or Leven; a pale Countenance; Coldness of the extreme Parts; Swelling of the Belly; Gripes, and Collick Pains; Yawning; Itching; Rubbing the Nose; and a short dry Cough. The like happens from Crudity in Infants for Want of their Teeth, and swallowing their Food not duly broke; and this with Swelling of the *Hypocondria*, and Flatulencies.

Many of those Fevers which are called *Symptomackal*, and especially those joined with Inflammation, may also be *Concomitant*; Such for Instance, as are themselves produced at the same Time with an Inflammation, or are such as necessarily bring an Inflammation with them; but because it is of no Moment,

ment, as to any Intentions of Cure, it is not worth while to recite their various Kinds here; only one Sort therefore we shall explain here, which, as it naturally comes upon all before they are passed to full Growth, it is of the greatest Concern that we should be furnished with Means of Preservation against it: And this is that sort of Fever that precedes the Measles and Small-Pox, of which we shall presently come to treat; but in the mean while it may not be amiss to observe, that the Reason does not plainly appear why Physicians should commonly rank *symptomatick* Fevers amongst the *Continuents*; for if the Cause generating a *symptomatick* Fever be of that Nature, as will suffer it to come to a Period, there will then be a *symptomatick Intermittent*; nor do I see any Reason why such a Cause should not subsist.

Of the Measles and Small-Pox in Children.

ANTECEDENTS. A beating Pain in the Head and Temples; great Doziness, frightful Sleeps; Deliria; sometimes Tremors and Convulsions; frequent Sneezing; Hoarseness; a Cough; Difficulty of Breathing; Heat; High-Co-

Colour, with a pricking Pain all over the Body; Pain in the Back; great Anxiety and Inquietude; involuntary Tears; Shining and Itching of the Eyes; the Face puffed and red; and a *Synochus* with all these Symptoms very much aggravated from the Beginning, insomuch that the Disease seems always to be at its Height.

CONCOMITANTS. Pustules, either of the larger Kind which suppurate, and are called the Small-Pox; or very small ones, like little Asperities upon the Skin with Redness, like an Erysipelas, and are called the Measles: These spread all over the Body, particularly the Face, Arms, and Legs, and they generally disappear by the fifth or seventh Day, without any Suppuration. The true *Small-Pox* come out with Redness and Inflammation; tho' there is a Sort that throws out Pustules like them in Bigness and Figure, by the common People called the *Chicken-Pox*, which are only Vesicles turgid with Serum, that break and dry away by the third Day without any Danger, and commonly happen without any Fever. The Measles and Small-Pox are reddish, white, yellow, purple, livid, and black; breaking out sooner or later, and sooner or later drying away; affecting either the exterior Parts of
the

the Body only, or also sometimes the inner Parts and *Viscera*; and lastly, they are either according to *Avicen*, *depurative*, wherein the excrementitious Parts of the Blood only putrefie, and are critically thrown out upon the Skin; or *corruptive*, wherein also the good Blood putrefies; those presage well, but these ill.

CONSEQUENCES. A thorough Recovery of Health after the Small-Pox with red, white, soft, distinct, and round Pustules, which, in a small Number, break out only upon the Surface, and not at all in the inner Parts; where the Fever ceases, or is much diminished upon Eruption, and all the Symptoms abate, with a clear Voice, and Freedom of Respiration: But, on the other Hand, where the Pustules come out slow, thick, large, double, continued, depressed, green, livid, black, or having black Specks in the middle, mixed with purple Spots, or such as are livid or black, Sinking soon after Eruption, and the Swelling of all Parts subsiding with a Loosness, and a Urine bloody or black, or both Stools and Urine bloody, or consisting of pure Blood, with bleeding at the Nose, from the Gums, or any other Part of the Body, with a high Fever, no Ways decreasing after Eruption, Anxiety, Inquietude,

quietude, Difficulty of Breathing, great Thirst, Flux or Dysentery, there is the utmost Danger, if not Death.

The ANTECEDENTS, CONCOMITANTS, and CONSEQUENCES to periodick intermitting Fevers.

An intermitting Tertian.

If the Circuit of an *intermitting Tertian* does not exceed 12 Hours, it is called a *legitimate intermitting Tertian*; but if it exceeds that Space, it is termed simply a *Tertian*, or a *spurious Tertian*; and if it is protracted beyond 24 Hours, a *long Tertian*.

ANTECEDENTS. All those Things which generate an excrementitious Bile; Intemperature, especially of the Liver, and a hot and dry Stomach; Youth; Heat; a hot and moist Constitution of Air; Watchings; Care; Anger; Fasting; hot Meats and Drinks; too great a Use of hot Medicines; and too much Labour and Exercise; and these are the Fore-runners of a *legitimate Tertian*; but if these happen to phlegmatick or pituitous Constitutions, so that they can be joined with Causes generating dry or cold Humours, they will precede a *spurious* or *long Tertian*.

CON-

CONCOMITANTS. On the first Attack of the Fit a vehement Rigor, Shaking the whole Body, and as it were pulling the Flesh; but it may also happen sometimes in a more remiss Degree, and on the ceasing of that comes on a great Heat, diffusing it self all over very intensely, though upon laying the Hand long upon the Patient it seems to remit, and not to be greater than that of the Hand it self; Throwing off the Cloaths; Difficulty of Breathing; thick and hard Respiration; Thirst; Bitterness in the Mouth; Dejection of Appetite; a Desire of any Thing cold; Watchings; Deliria; Pains in the Head, especially about its Height; the Pulse in the Beginning of the Paroxysm small, weak, and slow; but on its Aggravation, high, quick, and equal. (Some say in other Respects unequal, in particular Regard to the Unequality of the Fever; that is, the Dilatation is quicker than the Contraction, as also when the Contraction is in less Time than the Dilatation; but both these are notorious Fictions, and contrived to explain the Expulsion of Fuliginosities, and an Attraction of cool Air, and may easily be demonstrated fictitious from the very Nature of Pulses.) If a Person drinks when the Fit is at the Height, a Profusion of Sweat rises

rises through the Skin; at this Time also there are bilious Vomitings, tho' these are more common in the cold Fit; high coloured Urine; a warm and equable Sweat all over the Body; the Pulse quick and high; the Urine grows less red, and yellowish, of a moderate Consistence, and at last with a whitish Cloud, or settling in it; and the Fever is then not protracted beyond the fourth Fit: But if the Urine is very red, and there appears no Cloud or Suspension in it during the first Circuit, it will continue to the seventh Paroxysm; and that *Tertian* which is attended with all these Symptoms, and shews in the first Fit a light and equal Sediment, will be very mild, and not continue beyond the third Return. It also will go away if Pustules and Scabs break out upon the Lips and Nose; as also upon a Looseness.

CONSEQUENCES. *Hippocrates* says :
 ' Whatsoever Fevers which do not in-
 ' termit grow stronger on the third
 ' Day, it portends Danger; but if they
 ' intermit but in any Respect there is
 ' no Hazard at all.' But this is not
 universally true, as will be made appear
 from the following Demonstrations: A
Spurious Tertian.

An intermitting Quotidian.

ANTECEDENTS. All those Things which generate Phlegm; a languid Warmth of the Bowels; a cold and moist Diet, and Plenty of it; a corpulent and pale Habit; contracted Veins and Arteries; Declension in Age; female Constitutions; Inactivity; intemperate Eating; a cold and moist Temperature of the Season, Air, Climate, or Place; long Sleeps after Dinner; the Use of cooling Medicines; Listlessness of Body and Mind; much Sleeping; Dreams of Water, Snow, and Drowning; a slow, small, soft Pulse; and the Urine sometimes white, pale, and thin, and at others, thick with much settling.

CONCOMITANTS. It comes upon a Person chiefly in the Night Time, and not suddenly, but by Degrees, with great Cold in the extreme Parts; nor is the Shaking like that in a *Tertian*, but gentler, and afterwards a Heat slowly, with Difficulty, and much Inequality increases, so that sometimes the Patient seems to be hot, and at others to be cold; and this Heat is not sharp or dry, but attended with Moisture, not unlike what arises from the Burning of green Wood, and it affects
the

the Feeling, as if passed through a Seive: If the Hand be continued upon the Patient, the Heat after some Time appears more intense, and it diffuses universally; but the sick Person is neither impatient of Cloaths, so as to throw them off, nor does he breath thick or hard, nor covet Drink, nor is his Tongue dry, but moist. In the Attack, the *Hypochondria* are swelled and puffed up; and the Countenance continues pale even to the Height of the Fit, and is sublivid and swelled; the Body is lumpish, and there is a great Propensity to sleep, especially in the Fit, and in which there is also sometimes a Sinking at Stomach, as it is commonly called. The Urine is at first white, thin, crude, and sometimes deposits a Sediment; but that Sediment is not in Reality the Effects of true Digestion, but a Portion of crude Humours; in the Progress of the Distemper it becomes thicker, more turbid, and sometimes red; the Stools are crude and slimy. At first there is no Sweat, but after some Time the Patient begins to sweat towards the Declension of the Fit. The Pulse is very small and low; but about its Increase quicker and unequal, and throughout slower than in any other Fever; whereas in a *Tertian* it is greatest and

and quickest, but in a *Quartan* between both. The Fit is extended to eighteen Hours, and sometimes to twenty four, so as to resemble a *Continuent*. This Fever continues a long Time, (tho' it seldom happens,) as three or four Months, and sometimes much longer.

CONSEQUENCES. A Cachexy, a Drop-sie, a Cerus, Lethargy, and the like grievous Diseases.

An intermitting Quartan.

ANTECEDENTS. All those Things which generate black and melancholy Humours; the Age above forty Years; Autumn; a cold and dry Constitution; a weak, obstructed, and tumid Spleen; the Use of gross Food, such as Beef, Stag, or Brawn, salted and Smoak-dried, foul Water-Fish; coarse Herbage; Pease; Beans; unfermented Bread; foul Wines, and Beer; Vinegar, whence *Hippocrates* asserts Vinegar to be hurtful to melancholy Persons; Cares; Grief; hard Study; Hurry of Employ; suppressed Evacuations, and chiefly that of the Hemorrhoids; the Colour of the Face and whole Body dusky, and unequally inclining to Blackness, and Spots sometimes all over the Body; a dry and lean Habit of Body; Sadness of Countenance; Love of Solitude; disturbed
E Sleep,

Sleep, and Dreams of Death, dead Carcasses, Funerals, and the like Occasions of Sorrow; the Urine, if nothing of Melancholy is separated with it, is thin and white; but if it has Melancholy in it, it is thick, livid and black.

CONCOMITANTS. Its Attack with Yawning and Stretching, and a troublesome Sensation all over the Body, which is followed by a Shaking at first gentle, but in the Progress of the Fit by Degrees greater, until it becomes vehement, with a chattering of the Teeth, as those who shudder with the Winter's Cold; and it gives a Sensation of something not so much pungent, as ponderous, compressive, and as it were breaking the very Bones, which Pain by the *Greeks* is therefore called *ὀστοχόμ*; and afterwards a Heat begins by Degrees, not raging and burning as in a *Tertian*, but remiss. It terminates in a long and perfect Cessation of the Fever: The Pulse through its whole Progress is slow and small, and in the Beginning slower than in any other Fever, and this Property is preserved through its Rise and Height much beyond what it is in all others. The first Days there is no Sweat, but afterwards very large ones. The Urine is in the Beginning white, thin, and limpid; but as the Disease goes on, grows more red,

red, and both its Colour and Contents are frequently changed. The Thirst is moderate between that of a *Quotidian* and a *Tertian*, greater than in one, and less than in the other. The Duration of the Fits, much the same as a *Tertian*, and sometimes longer.

CONSEQUENCES. A short and salutary Dysentery; and *Hippocrates* says, *Lienosis difficultas intestinorum superveniens, bonum*; and elsewhere, *Qui Lienis difficultate intestinorum corripuntur, iis longam supervenientem Dysenteriam aqua inter Cutem, aut Lavitas intestinorum excipit, & moriuntur*. A Dropsie, or a Scurvy, if it be attended with any Disorder of some of the more noble Parts, as the Liver, Stomach, or Spleen; it is for the most Part fatal to People of sixty Years of Age, and mortal when it turns into a *Continuent*; in like Manner a dangerous Hemorrhage at the Nose, and a Cachexy.

A Semitertian Fever.

A Semitertian is, 1. *Phricodis*, commonly called a Shaking Fever; and, 2. *Imitritæos*, which, properly speaking, is a Fever compounded of an *intermitting Tertian*, and a *continued Quotidian*, so that it never comes to a final Termination; and in this Disease it is particularly

cularly to be remarked, that through its whole Progress the Shakings and Rigors very often return, and especially in the Accession of the *Tertian*, wherein it differs from the Rigours that happen upon internal Abscesses; for *this* returns many Times in a Day without any Manner of Certainty, and for the most Part with a small Appearance of Sweat, which the Rigour of a *Semitertian* has not. It is for the most Part mortal, and affects the Mouth of the Stomach, and nervous Parts; it brings on a Lethargy, Delirium, and faint Sweats; greatly dries the Tongue, and causes *Syncope's*, vehemently affecting the inner Parts, and hath in all Respects, as *Galen* expresses in his Book *de Typis*, a very unruly Progress.

The ANTECEDENTS, CONCOMITANTS, and CONSEQUENCES of erratick Fevers.

ANTECEDENTS. A vitious Disposition of divers Humours, from Errors in Diet, as the Mixture of many Kinds of Food, some of which are of easie, others of difficult Digestion; some disposed to generate Bile, others Phlegm, &c. Inequallity and Changeableness of Seasons, and Diversities of Heat, Cold, Moi-

Moisture, or Dryness every Day; and other Fevers not finally terminated.

CONCOMITANTS. Vague and uncertain Accessions, without any set Form, or the Appearance of a Fever without any Rule or Method of Progress; in the first Accession sometimes a Rigour is followed by Heat and Sweat, in the second no Rigour, but a moderate Shivering, and the Heat goes off, or their Deceptions, without any Sweat: Now they come on only with a Stretching, have a protracted Heat, and end without Sweat; at another Time with Vomiting and Thirst, and sometimes without either: Sometimes they return but once a Week, at others twice or three Times, but without any Certainty, or set Periods; sometimes they leave the Body free for five or six Days, at others they return at three or four Days End, and sometimes come even twice in one Day.

CONSEQUENCES. They commonly settle into *Quartans*.

CONCOMITANTS to Fevers in General, or the common Symptoms of all Fevers.

Pain of the Head; Watching, with or without Pain; a dozing Sleep in some Fevers, especially in *Quotidians*, *Semitertians*, and *Malignant*; Delirium; Phrensie; Convulsions, especially in *Malignant* and *Pestilential* Fevers; Bleeding at the Nose; a Cough; a Tongue dry, black, rough, inflamed, sometimes furred with Slime, at others with a Crust, which now and then likewise goes over the whole Mouth, and the Oesophagus, even down to the Mouth of the Stomach; Thirst, and that sometimes with a great Burning at Stomach, and at others with a scorching Heat from the Lungs, and great Burning in the Breast; Hiccup; Cardialgy; Loathing; Vomiting; Looseness; Symptomatick Sweats; Fainting; Syncope's, especially in the *Malignant* Kind; Pain in the Loins, Inquietude, and an Inappetency common to almost all Fevers.

But although many of these are enumerated under all Fevers in their respective Places; yet because they are uncertain, and may happen to this or that Sort, and sometimes more, and at others

others fewer, chance to appear in the same Fever, in Proportion to its Intension or Remission, it was judged proper to recite them here together, that it may be known these are not all necessary Conjuncts of *this* or *that* Fever, or to belong to any particular Period; but that some Fevers happen without them, most of them especially, and others with them all, or most of them at least, as will abundantly appear from those Propositions in which we are going about to demonstrate, *What is a Fever*: And these are as follow:

What is a FEVER.

PROPOSITION I.

There is no FEVER without some Fault in the Blood.

By Blood, I would be here understood to mean with *Galen* and other physical Writers, whatsoever naturally flows through the Arteries and Veins; for they so call that circulating Fluid, although it is not pure Blood, but compounded of Blood and other Humours. Because *these* therefore are the

Requisites of a natural Pulse, that every Stroke of it against an Artery hath a certain *Impetus*, that it presses the Artery outward for a certain Time, and that some certain Space intervenes between every Appulse of it against the Finger; with many other Properties of like Kind, that are most remarkably known to be inseparable from the Pulse of a Person in Health; where *these* do not happen, the Blood is necessarily vitiated, for while it continues its natural Properties in the Vessels, the Pulse will also be natural; but there is no Fever wherein the Pulse does not deviate from its natural State, that is to say, wherein it does not want some or all of *those* Requisites which constitute a healthful Pulse; and therefore there can be no Fever without some Fault in the Blood; according to the Proposition.

Because therefore every Fever is attended with some Fault in the Pulse, and every Fault of the Pulse with some Fault in the Blood, it concerns us now to enquire how many Ways there are to vitiate the Blood, and whether every one of these can disorder the Pulse: For if we can find some or all of those Ways which vitiate the Blood, necessarily to induce some Fault in the Pulse, and moreover that if with all the Relations and manifold Affections with which

which all Kinds of Fevers are attended, it comes necessarily to be discovered that *this* or *that* particular Kind, or *this* or *that* Fault of the Blood, is from *this* or *that* Cause, and thence be collected some one Thing that is common to every Fever, we shall then know what a Fever is in General. To this therefore let us immediately proceed.

PROPOSITION II.

The Blood cannot be vitiated, unless its Motion, Quantity, or Quality, is vitiated: There are no other Ways of disordering it, and every one of these is attended with a vitiated Pulse.

It is the current Opinion that nothing can be intimately vitiated, and as they term it commonly, in its *substantial Form*, unless a Progress be made towards such a Change by the Mediation of those Qualities that are essential to its Existence, into which the Corruption is first to be induced before it can reach the Form it self. But if we will hear *Aristotle* himself, this Change of Qualities is the Change of its Form, I say, of
its,

its, so much talked of, *substantial* Form; which, whether it be in the Elements, or in the Compound, he asserts to be nothing else than, in the *former* certain primary Qualities, and in the *latter* a particular Contemperation of them together. But since *Democritus* hath before advanced the same Opinion with *Aristotle*, although not perhaps in the same Words, we may rely upon the Opinion of either, or both, those great Men in the Case before us, and according to their Doctrine pronounce the Blood to be vitiated where its Qualities are so, because the Blood is a Compound of them, whether such Corruption is supposed to be communicated by those Qualities only, or gone so far into that secret and constituent Principle wherein its very Essence as Blood consists. And here by the Way it is desired to be taken Notice, that it is of no Purpose to distinguish in this Proposition, wherein the Blood is said to be vitiated, whether it is so formally and substantially, since that is not separable from its Qualities.

But because that an Animal may exert those Operations which are derivable from the Blood, it is not sufficient, that this same Blood should be compounded of certain Elements, and be

be in a particular Manner blended together; but that also it should subsist in such a Quantity, as from it may be derived whatsoever is necessary to circulate through the animal Canals, and as much as is necessary for a continual Recruit; it follows that as often as the Blood is defective in Quantity, although not so changed in Quality as to induce a Disease, it may properly be said to be vitiated; not as such a particular Composition, but as there is not enough of it, for the Preservation of that animal, for whose Sake such a Fluid is contrived by Nature: And by the same Way of Reasoning it will appear, that the Blood ought to be accounted in Fault, although existing both in due Quality and Quantity, whensoever it flows not according to the known Laws of Circulation (for this we always understand when we speak of the Blood's Motion absolutely) from the Heart through the Arteries, and thro' the other Canals back again to the Heart; for such a Circulation is necessary to an Animal's Preservation, and to enable it to perform those Functions that are requisite to it as such. Because therefore, besides the Quality of the Blood, there are no other Affections belonging thereunto, but its Quantity and Motion, it is plain that the Blood
can-

cannot be vitiated any other Way but in its Motion, Quantity, or Quality, or that it can be in any other Respect faulty, which is the first Part of the Proposition.

It remains therefore to shew, that from which soever of either of those Causes the Blood is faulty, whether in its Motion, in its Quantity, or in its Quality, the Pulse is always necessarily disordered; and that it may in particular happen from a vitiated Motion, is thus easily to be demonstrated.

Because the Celerity and Slowness of the Blood's Motion constitute the Measures of its Velocity; and the Diversity of that *Impetus* with which the Arteries are thrust outwards, is measured by its Strength or Weakness; and the Diversity of those Intervals wherein the Blood is alternately protruded through the Arteries, consists in the Rarity and Frequency of the Pulse; these, and all other Conditions of like Kind, succeed regularly or irregularly in

The Pulse disordered by a vitiated Motion, and by an augmented Quantity of Blood.

the Pulse, as the Blood flows regularly or irregularly through the Arteries: and therefore from a vitiated Motion of the Blood in the Arteries must ensue a disordered Pulse.

It is yet of a more difficult and extensive Nature to demonstrate, how the Pulse is disordered from a Blood vitiated

vitiated in Quantity or Quality, but that it is so from both Causes is equally evident.

Since the Blood may err in Quantity, either by abounding, or being deficient, first of all let it be supposed in Fault from too great a Quantity only, in all other Respects remaining in its natural State. Because then the Blood is supposed more in Quantity than it ought to be, the Arteries will be fuller than natural, and consequently the Pulse fuller also; and because also with this over Quantity there is in other Respects supposed its natural Qualities, therefore in such an over Quantity will there be contained more of that Liquid which is destined for the Nerves, and consequently will more of it be separated into, and flow through them, than in a natural State: The over Quantity of this Liquid flowing through the Nerves causes the Elastick Fibres, into which it runs, to contract more frequently, and with greater Strength. The Heart is a Complication of such Elastick Threads; since therefore with a greater Quantity of Blood there runs a greater Quantity of Fluid into those constituent Elastick Threads, the Heart will beat with more Strength and Frequency in such an over Quantity of Blood,

Blood, than when it is in its natural Quantity: If therefore from a more strong and frequent Contraction of the Heart, the Pulse is also more strong and frequent, of Consequence must a greater Quantity of Blood make the Pulse more strong and frequent than natural.

The Pulse also is from the same Cause greater, for since with all the forementioned Conditions there is likewise joined a Fulness of the Arteries, from such an increased *Impetus* of the Heart, will such an increased Quantity of Blood more distend the Arteries, and thrust their Coats outwards for a longer Space of Time; that is, the Pulse will be greater.

But these Appearances yet arise more necessarily on two other Accounts; for because the Arteries are filled with a greater Quantity of Blood, insomuch that they cannot be more distended but by a greater Quantity yet protruding into them, and endeavouring their farther Dilatation; their Coats in all Parts endeavour to dilate outwardly, and by that Means the more press against every Thing with which they come into Contact; and as the whole Body of the Brain is wrapped round by the Arteries of the *Pia Mater*, by a greater Quantity therefore of Blood the Brain must

must be more compressed, and consequently in any given Time a greater Quantity of Fluid derived into the Nerves, and contractile Membranes, than in the same Space of Time from a lesser Quantity of Blood; whence the Heart must beat more frequently and strongly, and the Pulse also be stronger, quicker, and greater. Again, because the Blood is supposed to abound in Quantity, and on other Respects to be in a natural State, therefore in every Restitution of the Auricles and Ventricles of the Heart, more Blood than natural flows into their Cavities, or a Quantity containing more Particles of Blood; but by Nature these are all equally hot, and therefore in a greater Quantity of Blood there flows into the Cavities of those Parts more hot Particles than in a natural Quantity, whence there will arise in those Parts a Heat greater than natural, whence also a Derivation of more Fluid through the Nerves into those Muscles, and consequently a stronger and quicker Contraction, and a corresponding Pulse. But what is here advanced concerning the Heat of the Blood, appears not to be the Result of any new Quality, but its Quantity only, for it excites a Sensation of greater Heat, not because the Heat is more intense in every respective Particle

ticle of Blood, but because while the same Degree of Heat continues in every single Particle, those Particles are increased in Number.

Yet if all these do not suffice to account for the Disorders of the Pulse from a greater Quantity of Blood, the Reader may turn back to what hath been said concerning an intermitting Pulse; for from thence it appears, and is plainly demonstrated, that every Kind of Inequallity in the Pulse is to be accounted for from this very increased Quantity of Blood, even thro' all the Varieties of Intermission, and Death it self: And therefore does it necessarily conclude from all the forementioned Premisses, that a disordered Pulse is inseparably the Attendant of an increased Quantity of Blood.

Here it is however to be further noted, that the Quantity of Blood may be increased to such a certain Degree, as to change the Pulse, during such an Increase, from a strong and quick one, into slow and weak; for if the Arteries are so distended, that they press upon the Brain too much; that is, if they straiten the Nerves, and render their Capacities less, so as not to admit of a due Influx of Fluid into them from the secerning Glands; and in like Manner if the Arteries, running
amongst

amongst the contractile Fibres, do by their Distention outwardly so compress those minute Tubes, that their Cavities are lessened, and the Admission of that Fluid necessary to contract them rendered more difficult, such Fluid will distil into them more sparingly, and in lesser Quantity, whence their Contractions, and that of the Heart it self, will be slower and weaker, that is, the Pulse will be slow and weak; and therefore in all Respects does the Proposition hold good. On the contrary likewise is it manifest what Disorders of the Pulse must arise from a Quantity of Blood less than natural; wherefore it stands demonstrated, that a disordered Pulse is the necessary Consequence of the Blood's Error in Quantity.

The Pulse disordered from a diminished Quantity of Blood.

In the third Place it concerns us to enquire, whether a disordered Pulse is occasioned by Blood vitiated in Quality, and whether from its being vitiated in all its Qualities, or only some of them. First then, it is manifest that its Qualities can be vitiated only in two Respects, either in that Principle whence they all result, or when that Principle, in it self naturally disposed, is restrained from Exertion, or, which is the same Thing, produces no Qualities, and which is all one as to

Only two ways of vitiating the Blood, either in its Principles, or the Qualities resulting therefrom.

the animal Functions, as if it was plainly destitute of all Qualities, or produced such as are vitiated. Because therefore the Origin of Operation, or of Qualities, both according to *Democritus* and *Aristotle*, is nothing else than a certain Power, or Condition of Cohæſion in the Parts constituting every Compound; by whatsoever Cause therefore that certain Power, or Condition, is vitiated, the Origin of Qualities will be so to, and consequently the Qualities thence arising. Every Power likewise of a determinate Degree can be disordered only in two Respects, that is, in being greater or less than natural; and in like Manner every Condition of Cohæſion between the Parts of a Compound can be but two Ways perverted, either in a Separation of some Parts from their natural Contacts, the others remaining as before, or a Change in the natural Contacts of all the compounding Parts: And how the Pulse is affected by all these several Ways is now to be shewn.

And first of all let there be supposed a greater Cohæſion than natural between the compounding Parts of the Blood, that is, that the primary constituent Parts have a greater *Nisus ad Contactum*; and there be supposed also a certain Point of Time wherein
such

such a Cohæſion of the Parts greater than natural firſt takes Place; before this certain Time then all Things will be in their natural State, the Nerves will contain their natural Quantity of Fluid, which will flow in its natural Pace, and contract the Heart, and determine the Pulse, as in a State of perfect Health. But becauſe by the circular Motion of the Blood, ſomething is continually ſeparated from it that paſſes into Perſpiration, Sweat, Urine, Bile, Phlegm, Spittle, and other Humours, every one of which hath a determinate Quantity of Cohæſion in the whole common Maſs, that cannot be overcome, but by the natural Motion of the Blood; where therefore the Cohæſion between the Particles of Blood is ſo much increaſed that the Humours are not ſeparated from it in any given Space of Time, as they would be in a natural Cohæſion, ſo that the Veſſels become more full, the Arteries will preſs more ſtrongly outward from the very Moment of ſuch an augmented Cohæſion; and therefore as they then alſo find the Nerves turgid with their natural Fluid, that will flow into the conſtituent Fibres of the Heart, both in greater Quantity, and faſter, whence the Pulse will be

quicker and stronger, and by Means of an increased Quantity of Blood also greater and fuller.

The Pulse disordered from an increased Cohæſion of the Parts constituting the Blood.

But in the mean Time, by Reason of an augmented Cohæſion, there is little or none of the nervous Fluid strained through the Glands of the Brain after a few Pulsations, the Pulse then becomes weaker and slower than natural, and may in a little Time altogether cease beating, when the nervous Fluid ceases to flow into the Fibres contracting the Heart, altogether, or in a very little Quantity: The Cohæſion therefore of the compounding Parts of the Blood being vitiated, so that it becomes greater than natural, the Pulse will also correspond therewith.

As also from a diminished Cohæſion.

Because by the *Impetus* of a natural Motion, attended with a Power of Cohæſion between the compounding Parts of the Blood that is likewise natural, the whole Maſs is reſolvable into its ſeveral Humours, so that in a given Space of Time they are derived into their reſpective Canals in their natural Quantities; therefore the ſame *Impetus* being given, but a leſſer Degree of Cohæſion, that is, the Reſiſtance neceſſary to be conquered by ſuch an *Impetus* of Circulation, in Order to a due Secretion of Humours, being leſſen'd, a greater Quantity of them than

than natural will be separated in any given Space of Time: And hence likewise will it also follow, that more Fluid will pass through the Nerves, whence a more frequent and strong Pulse. Because moreover from the same Diminution of Cohæſion, the Heat is put into more Liberty of Motion, with other Particles also of greatest *Impetus*, whence the Blood swells, rarifies, boils, and ferments, so as to take up more Space; on these Accounts likewise will the Pulse be affected, as from a Distention of the Arteries by too much Fluid, and the same Disorders in that arise, as we have already shewed to happen from an augmented Quantity of Blood.

From too free an Heat, and such like vellicating Particles, the Heart feels a *Stimulus*, or a Sensation sharper than natural, by the Means of which a greater Quantity of nervous Fluid is derived into it, and the Pulse is more frequent and strong with all those other Concomitants resulting from too great a Distention of the Arteries. The Pulse is therefore equally disordered both from an augmented, and a diminished Cohæſion of the constituent Parts of the Blood.

Yet this Disorder of the Pulse does not necessarily happen from a vitiated Cohæſion of the Particles, whether it be

The Pulse is total or partial. Suppose, for Instance, *probably, but* this last to be the Case; and therefore *not necessarily* some only of the constituent Particles *disordered by* of the Blood continue in their natural *a vitiated Cohæ-* Contact, and therefore from them alone *sion.* can be generated a Supply of the nervous Fluid; which then being not generated from all the Parts of the Blood, will be less than that Quantity required to produce a natural Pulse, and consequently on this Account will the Pulse be slower and weaker; that is, it will be distempered. But because it may also happen, that although those other Parts separated from their natural Contacts may not be able to produce all those Effects, to which the Particles constituting a natural Blood are destined, yet they may supply Recruits to the nervous Fluid in Quantity sufficient to a natural Pulse; and therefore will there be a Case where the Conditions of Cohæsion in those Parts constituting the Blood are vitiated, without any Disorder of the Pulse. Again, because it may in like Manner happen for the Particles which are divided from their natural Contacts, to change into some other Disposition, suitable for the Production of a greater and more vivid Quantity of Spirits, the Pulse must then also be disordered, and in the same Circumstances as have been

been

been described already, to proceed from a diminished Cohæſion of the ſame Particles.

The like to theſe will further happen, if all the conſtituent Particles are looſened in their natural Cohæſions; for if by ſuch Separation ſuch a new Diſpoſition ariſes that will yield fewer or no Spirits at all, the Pulse will be ſlow, and weak, or altogether ceaſe; if the Spirits are generated in Quality and Quantity like that which is natural, although nothing elſe natural reſults from this new Compoſition, the Pulse will be natural; but if it generates Spirits in greater Quantity, or of greater Activity, the Pulse will then be quick and ſtrong, ſuch as is before explained to happen in a diminished Cohæſion. Therefore the Conditions of Cohæſion in the conſtituent Particles being changed, by their Separation either totally or partially, does not always neceſſarily change the Pulse.

Let it be next ſuppoſed, that the Principle of the Blood's Qualities, the Conditions and Quantities of Cohæſion in its conſtituent Parts to be natural, but that this Principle is ſo affected that no Qualities can flow from thence, there then muſt be ſome Cauſe hindering their Efficacies, and ſuch a one as cannot be inſinſick in the Principle it ſelf;

*The Cauſe
hindering the
Exertion of
the Blood's
Qualities is
not inſinſick,
but ſome ex-
trinſick Body;*

self; for otherwise that could not be in its natural State, and therefore must it be altogether external, and brought into Contact with the Particles of the Blood; nor can it be any Thing but something corporeal, as also some Species of Matter that never makes a Part of the Blood, but is altogether foreign to it, and the Vessels in which it circulates.

This Matter therefore, foreign to the Blood, is either of such a Bulk, as to take up more Space than is naturally found between two Particles of Blood, or it just fills so much Space: In the first Case it thrusts the Artery outwards more than natural, from whence its Pressure is greater upon the Brain, the Influx of the nervous Fluid more frequent, and in more Plenty into the Muscles, whence the Pulse is stronger and more frequent; And further, if this Matter mixed with the Blood be of that Nature, as not to remain at rest in Contact with its Particles, but to agitate it on all Sides, so that the whole Mass becomes more loosened in its Cohæsion, it will rarify, and rise in Bubbles, and the like, whence a greater Protrusion of the Arteries outwards, a greater Pressure upon the Brain, &c. All which happen in the first Moment of its Mixture,

ture, for then the Nerves are naturally full, that is, they are furnished with their natural Quantity of Fluid. But because by this Sort of Matter the Quality of the Blood is supposed to be restrained, this must therefore be in some or all of 'em; if in all of them, the Generation of Spirits is cut off, whence succeeds a sensible Debility, and a Slowness of the Pulse; the like also happens when all the Qualities are not restrained, so it chance to be that whereby the Spirits are generated in the Brain; but this Damage may again be repaired by Means of the same Mixture, if it chance to be of that Nature, as in its Passage through the Glands of the Brain will admit of a Separation of such Parts from it into the Nerves, as from a natural Blood; and if such a Separation happens in a Quantity greater than natural, the Pulse will become more quick and strong than natural; if less, slower and weaker; and if equal, a natural Pulse. But it never fails in this Circumstance, but that the Pulse is fuller than natural, by Reason of its Excess in Quantity from the foreign Mixture.

It again further appears, that when this foreign Matter possesses those Spaces only which are contained between every two Particles of Blood, it ought

When the Blood is necessarily vitiated by the Mixture of such Matter,

to remain there at Rest, or in some Measure so; for otherwise it would shake those Particles further asunder, and make greater Spaces between them, under various Diversifications. But if this Matter thus causing more Room, immediately on its first Moment of Admission falls into quiet Union with the Particles of the Blood, the Arteries must be more protruded outwards, and the Pulse become fuller, more frequent, and more strong, by Means of the Quantity of Spirits already prepared, and existing in the Nerves; but because this foreign Matter is supposed quietly to remain in Contact with the Particles of Blood, and these again to keep in Union with them, whence a more consistent Mass of Blood will be generated, or a Coagulation of it more or less in Proportion to its Measure of Union with the Blood, whether it be absolutely so, or joined with it only imperfectly in some few Points of Contact; on this Account therefore will the Velocity of the Blood be less, and its Quantity of Cohæſion greater; whence a lesser Quantity of Spirits will be generated, and the Pulse be sensibly weakened and slower, unless in like Manner this Inconveniency be repaired from the Nature of this Mixture being such, that

that howsoever flow it flows through the Arteries, it is able to supply a Quantity of Spirits greater, lesser, or equal to what is natural, whereunto the Pulse does correspond in its Qualities. But whether this Mixture goes into these Contacts with the Particles of Blood, or agitates its Mass on all Sides, there will immediately ensue some Disorder in the Quantities and Conditions of its Cohæsions, whence correspondent Irregularities in the Pulse will follow.

Again, it may possibly happen that this Mixture in the Blood may be in less Quantity than the least Particle thereof, but of such Energy as to communicate thereunto successively a preternatural *Impetus*, whence will flow some or other of those Affections already explained, and a Pulse suitable to such Affections.

Lastly, This Foreign Cause is either mixed with the whole Mass of Blood, or only with some Part of it flowing through the Brain, at certain Intervals of Time, that is, as it happens to be thrown into its Course of Circulation; and if it happens to unite with the whole Mass, the Disorder of the Pulse is continual; but if it recurs at certain Intervals, and mixes only with some Part, such Disorder is diversified, as it may easily

easily be conceived in all its possible Circumstances, from what hath been already demonstrated. The Blood therefore cannot be vitiated, unless it be vitiated in its Motion, Quantity, or Quality; there is no other Way of vitiating it; and with every one of these is the Pulse disordered: which was to be demonstrated.

PROPOSITION III.

There is no Fever without some Fault in the Motion, or Quantity, or Quality of the Blood; or in some or all of these together.

Because there is no Fever but from some Fault in the Blood, with which is conjoined also a Disorder in the Pulse; and that the Blood cannot be vitiated but in its Motion, Quantity, or Quality, with every one of which the Pulse is disordered, as already proved in the foregoing Proposition; therefore there can be no Fever without some Fault in the Blood, either as to its Motion, Quantity, or Quality, and consequently is the first Part of this Proposition true: But because it
may

may happen, that in Conjunction may be vitiated its Motion and Quantity; Motion and Quality; Quantity and Quality; and its Motion, Quantity, and Quality altogether, as is in it self apparent, and will hereafter be more fully demonstrated; and that from every one of these Defections the Pulse will also come into Disorder; therefore the Pulse will in a much greater Degree, and more easily be disordered from some or all of those supposed Defections of Blood together; which in like Manner is plain from the foregoing Explanations, and the Doctrine of Pulses, and will be occasionally more clearly demonstrated in the following Propositions. This therefore under present Consideration remains proved.

And thus we have endeavoured to come at the Knowledge of that certain Condition, without which no Fever can subsist; and this Condition appears to be a Fault in the Blood, as to one, more, or all the above-recited natural Affections belonging thereunto: But because the necessary Conjuncts with any Thing may be different from that Principle which constitutes the very Nature of its Being, and is commonly called its Essence; therefore in order to understand

stand what a Fever is, it is not sufficient to know that it cannot subsist but with some one of the already enumerated vitiated Affections of the Blood, more, or all of them; but it lies upon us to find out something else in a Fever, which makes the necessary Connexion between a Fever and those vitiated Affections, and is also the Cause of all other consequential Disorders both of the Mind and Body, that are met with in a Fever; or to demonstrate that these very Faults in the Blood, which hitherto have appeared to us only as necessary Conditions, without which a Fever cannot subsist, to be in Reality that very Thing wherein the Nature of a Fever consists, to be its very Principle, Constituent, or Essence. Because therefore a Fever is a Collection of some or more of such Affections as are not natural to an Animal, if therefore we can discover what it is of those Affections in every Fever which does necessarily depend upon, and is joined with those Faults of the Blood, without which a Fever cannot subsist; we have demonstrated that those very Faults of the Blood are not only a necessary Condition to the Existence of a Fever, but also that very Thing wherein the Fever consists; so that the Thing sought,

sought, is nothing else but a Fault of the Blood; and this or that Fault, determines the Fever to be of this or that Kind. Let us therefore enter upon this difficult Enquiry, so that it may appear, *a Fever is nothing else but a vitiated Blood*; which we shall endeavour to do, by shewing in particular, whatsoever must necessarily happen in every Fever from a vitiated Blood.

PROPOSITION IV.

All those Things which precede a Legitimate Ephemera, disorder the Motion of the Blood.

Because Sadness and Fear are Affections attended with languid Motion, ^{Grief and Fear.} they occasion a lesser and slower Influx of Juice into the Nerves; and therefore by such Means are the Muscles contracted seldomer and weaker, the Heart partakes of the same Motion, and with that the Pulse or Motion of the Blood corresponds.

But as Anger is attended with ^{Anger} brisker Motion, it causes a greater Influx of Fluid into the Nerves, that is, more frequent and swift, and the Muscles, and consequently the Heart, con-

contract more frequently, more swiftly, and more strongly; and to that answers a Pulse that is strong, frequent, and swift; and to this a correspondent Motion of Blood.

Sollicitude.

But because Sollicitude of the Mind, is joined either with Grief, with Fear, or with Anger, or with Expectation that is equivalent to Fear, or Anger, it disorders the Motion of the Blood, and the Pulse in either of these Extremes, as appears from the preceding.

Watching.

Watching, if it is supposed so protracted, as to have in great Measure wasted the nervous Fluid, by their Defect or Poverty, the Pulse will become small, weak, slow, and seldom, and consequently a vitiated Motion of the Blood; or if it is continued but for a short Time, so that the more humid Part only of the nervous Fluid is wasted, and the Remainder reduced to such a Degree of Dryness, as to exert it self with greater Energy, it then comes to pass that the same Fluid, for Want of its usual Contemperature and Humidity, distils from the Nerves into the Muscles, both more frequently, and more strongly inflates them, whereupon the Pulse becomes more frequent, strong, and quick; and therefore is the Blood vitiated in its Motion. The like

like as happens to Watching in either Case, also belongs to Intention^{Intense} of Mind; whether it be greater and ^{Thought} longer, so as to waſt moſt Part of the nervous Fluid, or ſhorter, and carry away only its moſt humid Part.

Evacuations likewise belong to this ^{Evacuations} Head; for thoſe which are moderate may draw away only the more humid Part, and render the nervous Fluid more dry, but when in Exceſs they ſink the Spirits. But theſe do ſomething alſo on the Account of a *Stimulus*, eſpecially when they happen by Stool, or upwards; whereupon, by Way of Derivation, a greater Quantity of nervous Fluid than natural flows into the Heart, that is, as often as there is exiſting already in the Nerves univerſally ſo much, that it may by Derivation be drained into this or that particular Nerve; but if that univerſal Supply be deficient, there will not upon Derivation be drawn ſo much into any particular Nerve as a natural Quantity, but yet more than if ſuch *Stimulus* or derivative Motion was abſent.

Since therefore Pain may be conſi- ^{Buboes, eſpe-} dered as a *Stimulus*, it is manifeſt that ^{cially when} Pain will alſo diſorder the Pulse; and ^{they ſuppu-} the *Stimulus* at the Heart will be great- ^{rate.} er or leſſer, in Proportion to the Proximity or Diſtance of the Nerves primarily

marily affected; for the further they are off, the more languid is the Reflux, and consequently will it more difficultly pass into the Cardiac Nerve, not accustomed to dilate beyond its natural Capacity without Force; and the like even when the stimulated Nerve is nearer, in Case its Inclination towards the *Immissary* disposes it to affect the *Immissary Nerve* with more or less Difficulty, that is, with more or less Pain. There may happen therefore a very intense Pain, and that not far from the Heart, which shall not disorder the Pulse; and, on the contrary, a more remiss one in Nerves very distant from the Heart, which shall disturb it. Since likewise in Suppuration there is Pain, and moreover that all Tumours, when they are upon membranous and nervous Parts, so as to load, extend, and draw them from their natural Postures, occasion Pain, it is manifest that the Pulse, and Motion of the Blood, must be vitiated by them; and all this must happen on a double Account in an *Erysipelas*, because that cannot happen any where, especially in the finer Parts, without some Tumour, although small, since the Blood continually crowds thither, and some of it remains behind; And yet further, the burning Heat of an *Erysipelas*,

pelas, more sharply vellicates, or stimulates the Coats of the Nerves; and all these Ways of stimulating become of greater Efficacy on those extreme Parts where great Plenty of Nerves are distributed, and where they are very tense.

The Motion of the Body also necessarily vitiates the Pulse, for that shakes the whole nervous System; and, as it happens in the most minute Canals where Water sticks, or is but slowly moved, that it drops away upon Shaking, so their Contents which move on slowly, are forced hereby with *Impetus* into the Muscles, and such Efflux is rendered more frequent, than in a natural State, and more in Quantity also is shook out every Time, whence the Pulse becomes more strong, more frequent, and more swift, that is, the Pulse and Motion of the Blood are disordered.

Hunger and Thirst in Excess, suppose the Body already exhausted of its natural Humidities and Spirits, whence the Pulse becomes languid, slow, and seldom; but when these are not continued to Excess, wherein the aqueous Humidity only is wasted, and the Spirits rendered hotter, the Pulse appears under very different and opposite Qualities,

lities, as hath been before said of Watching.

A hot Temperament.

Hot Diet.

Air.

Drunkenness.

A hot Temperament generates more lively Spirits, from whence they more frequently distil into the Fibres of the Heart, and in more Plenty; whence the Pulse is more strong, and more frequent, and consequently the Motion of the Blood disordered; the same is also caused by a hot Diet, as will appear from the preceding: Also a warmer Air, and a Continuance in the Sun, or by a Fire, will, by wasting that Humidity which makes a necessary Part of the nervous Fluid, or by rarifying, or attenuating it, or by all these together, occasion the Remainder to flow through the Nerves more briskly, and to distil into the Fibres more copiously, and with greater *Impetus*, whence a Disorder in the Blood's Motion. Somewhat analogous to this will follow from Drunkenness, by Reason of the Heat which comes from the Wine; and moreover will there in this Case be a greater Fulness of the Vessels of the *Pia Mater*, whence a greater Compressure, and, on this Account, a greater Disorder of the Pulse, and Motion of the Blood, as it appears, must necessarily happen upon every Plenitude of the Vessels, from whatsoever Cause that Plenitude happens.

pens. Bathing also by Means of its *Hot Baths.* Warmth will for the same Reason disorder the Pulse and Motion of the Blood; and moreover as the Water relaxes and wearies the Body, it may easily occasion such a Transpiration of the Spirits, as thence to cause the same Alterations in the Pulse and Blood's Motion, as were before observed to arise from a Poverty and Defect of the nervous Fluid.

A Diminution of Perspiration by *A diminished Perspiration.* Fuliginosities, which are at that Time retained, will render the Spirits more acrid; and so by them, as well as the retained Humidities, will the Blood-Vessels be more filled, whence the Pressure upon the Brain is greater, and a Pulse and Motion of the Blood answering thereunto.

Crudity of every Kind, supplies but *Crudity.* a little of such a Juice as is necessary to generate Spirits, and even that is either acrid, or subtle, watery, or viscid: In the first Case the Spirits will be too sharp, and immediately exceed by their peculiar Activity that Quantity of Motion, which more consistent, and less sharp are Subject to in a natural State; whence the Pulse will be more strong and frequent; but by its continual Decrease of Quantity, will the Pulse soon grow weak and slow,

which likewise in the same Manner happens, when the Promptuary, whence the nervous Fluid is supplied, is too viscid and watery; because such a Juice contains a very small Quantity of Spirit.

Sleep,

Because also Sleep moistens, gives a Kind of Numbness, and procures a greater Sluggishness in the nervous Fluid; in too long Sleep the Spirits will become loaded with so much Humidity, as to grow more languid, sluggish, and scarce, and a less Quantity of them will fall into the Fibres of the Heart; whence the Pulse will be weak, seldom, and slow, and also a like Change in the Blood's Motion: And on the contrary by too little Sleep, as by immoderate Fasting, so much Humidity will be exhaled from the Spirits and Blood, as to give opposite Qualities to the Pulse.

too much.

Costiveness.

Lastly, Since the *Faces* of the Bowels by being retained too long grow hot and dry, the nervous Fluid will also be so too, both too hot and dry, or more apt to rarifie, and quicker of Motion, whence the same Disorders of the Pulse and Motion of the Blood, as was before explained to result from the same Qualities.

Retention of Urine.

The Urine being retained, makes it irritate and stimulate very much, whence it

it comes under the same Consideration as Pain; and therefore it appears that with all the above-enumerated Accidents there is necessarily joined a Disorder in the Blood's Motion, so that *this* does absolutely depend on *them*. But we must here observe, that since with many of the enumerated Affections there is also joined a Cause in the Blood that gives those Disorders of Pulse and Motion, yet it is not our Business here to enter into its Examination, because it concerns us here to explain only how it comes about, by Means of the abovementioned Affections, that the Motion of the Blood is disturbed, although there were not subsisting any Cause in the Blood, or in any Part of the Body vitiating it, but only affecting the animal Spirits in a Manner that is not natural. Wherefore the Proposition appears to be true.

PROPOSITION V.

From the above explained Disorder in the Motion of the Blood, does necessarily flow all the Concomitants of a Legitimate Ephemera.

Pulse.

From what hath been already said, it appears upon what the Disorders of the Pulse does depend, and upon what Necessity they act in a *Legitimate Ephemera*; as well when it is slow, weak, and small, as when more quick and strong, &c. since these all flow from a greater or lesser, a swifter or slower Influx of Spirits through the Nerves into the Fibres of the Heart. But because such Influx, whether greater or lesser, is for the most Part equable, that is, its Cause does equably persevere, hence must continue also the same Kind of Pulse, as long as such Causes cease not to operate, and the Operation of those ceasing, the Pulse returns to its natural State; or, which is the same Thing, the Pulse will remain equably vitiated, and when the Cause of its Disorder ceases, it will again come to its natural Measure.

But

But because Respiration is also per-^{Respiration.}formed by the Action of Muscles, where there is a greater Influx of nervous Fluid through the Nerves, and one that is more frequent, there likewise Respiration will be stronger and thicker; the like to which will also happen when such Influx is made by Spirits of greater Energy, &c. but the contrary when influenced by Spirits, and other Conditions of lesser *Moment*; but because by an augmented Force of the Heart the Blood is increased in that Velocity and *Momentum*, whereby its own Particles, which in the Vessels are compelled into Contact, act against one another; when therefore they recede from such Contacts with a greater *Momentum* than natural, they will more easily be separated, and obedient to those Properties, which even with a lesser and natural *Momentum* would part them from each other; and consequently from an augmented Velocity of Blood will there be a greater Number of Particles set at Liberty, and if they can perspire, and be perceived by the Touch, will appear to be greatly augmented in Efficacy and Quantity.

Heat however even in the Blood's ^{Heat.} natural Velocity is separable from it, perspires, and is sensible to the Touch; there

therefore in an increased Velocity of Blood, a great Portion of it will escape, and perspire, and affect the Touch more sensibly, or the Heat will be felt greater than natural, which either by Means of its greater *Impetus* of Motion, or Excess in Quantity, will prove very troublesome to the Patient. In Proportion also to its Increase of Motion will the Heat appear more or less moderate and pleasant; and if this Increase is really moderate, it will the more plentifully attenuate and evaporate; but it will not yet so far attenuate the Juices, as to render them altogether subtle and active, like the Particles constituting Heat, but they will so far still keep their own Nature, as in their Transpiration with the Heat to compose a Mixture of both Heat and Humidity, and render the Perception of it moderate and pleasant. For the same Reason also that this is the Result of transpiring a moderate Quantity of Heat, will such Heat be more diffused and general, and not burning and unequal, like that of a more intense Nature, but mild and remiss. The Increase likewise of this Heat will be equable, for since it owes its Rise to a Motion equably augmented, its own Progress must also be attended with the like Condition.

Be-

Because therefore from an Increase ^{Heat and} of the Blood's Velocity, its ^{Pain in the} *Moment* ^{Head.} within the Vessels is increased, and consequently its Heat, thence also it comes to rarifie, whereby on another Account it comes to have a greater *Nisus* against the Coats of its containing Vessels; wherefore it will distract them, and the Perception of such Distraction will be chiefly upon those Parts that are most membranous and tense, and so implicated with the Blood-Vessels, as to give some Check to its Progress, and such they are in the Head. In like Manner, as by this Implication of the Vessels, the Blood hath not so free a Current through them, so likewise by the Increase of its *Momentum*, and the Efforts of the Heat to escape, there is felt not only a distractile and drawing Pain, but also a Throbbing; and from the *Nisus* of the igneous Particles against the Membranes, a Sense like Pricking: The Heat also for the very same Reason will be most sensible about the Head, because the Blood by such Retardations as here mentioned will be more crowded there, and consequently those Particles be more numerous which give a greater Perception of Heat.

But because such a moderate In-*Urines* crease of Heat as is here supposed, or
its

its easie Escape from those Particles of the Blood with which it was before combined, hardly vitiates the Mass it self, therefore the Secretions of its derivative Juices, and those Fluids themselves which are naturally strained from it, will hardly be changed from their natural State; whence the Urine will be like that of sound Persons, and it will be well conditioned in Colour and Sediment. And further, because with that Disorder in the Blood's Motion which is occasioned by its Increase of Quantity, there is only an Increase of Velocity, by Means of that increased Velocity those gross Parts cannot be separated in the Kidneys, which give to the Urine its Colour, but only the more watery Particles, whence its Crudity and Whiteness; that is, in every increased Velocity the Urine is more crude and white, although there be not any Change of Quality in the Blood, whence such Appearances might otherwise be derived.

*Accession
without Cold,
&c. or some-
times a tran-
sient Sh. ver-
ing.*

Since therefore by an Increase only of Velocity, the Blood it self is not vitiated or disordered, but in an Augmentation of its Heat, immediately upon such Increase of Velocity will there also be a greater Heat, whence in the Beginning of a Paroxysm there is no other Perception but of Heat; and

and through its whole Progress, so long as the Cause of an augmented Quantity subsists, so long will the Perception of an increased Heat be continued. But if with the Cause disordering the Blood's Motion, something be joined that hinders the Separation of the Particles of Heat, or that prevents them when separated from evaporating, so as to affect the Senses of Feeling, then at the Beginning of such a vitiated Motion of the Blood, and throughout the whole Duration of that Cause, whatsoever it is which thus hinders the Heats Escape, or Influence upon the Nerves, there will be a Perception of Cold, or some Degree of it, which is called Shivering, or Stiffness, and such as is wont to happen more especially in that Change which is made by Drunkenness, too full a Meal, Diminution of Perspiration, and the like, which are more properly ranked amongst those Things which disorder the Blood in Quality.

Because by that Motion of the Blood *Decrease with* whereby its Particles act against one *Sweat, &c.* another, some are broke from their former Combinations, the Mass is rarified, and presses more forceably against its Vessels; and therefore the Blood more distends the Coats of its Canals, and is in it self more crowded, whence

whence there is rendered a more difficult Escape for its fluid Parts, which otherwise would evaporate and breath out, and consequently is there no Sweating in the greatest Degree of Heat; but when that sensibly remits, the Membranes grow more flaccid, and the Distention of the Vessels decays, the moist Parts get out, and appear in Sweat, and therefore is there a Diminution of the Heat with Sweat; which Sweat will resemble that of healthful Persons; because by such a moderate Augmentation of the Blood's *Momentum*, only the more lax Parts of it have been exhaled, and lie upon the Surface of the Body in a Dew, after which is restored a State of perfect Health; as the Cause which at first disordered the Motion of the Heart now totally ceases. Since these therefore are the *Concomitants* of an *Ephmera*, the Proposition appears to be true.

How the Urine in Passions of the Mind,

The Urine happens to be higher-coloured than natural, in such Passions of the Mind as are either attended with a diminished Velocity of Blood when more gross Parts are separated through the Kidneys with the aqueous ones, than are wont to be in a natural State, or when such gross Parts happen to be mixed with the Blood in an over-

over-Proportion, and belong to that Class where the Blood is vitiated in Quality, or when the Motion of the Blood is so augmented, that by Excess of Heat the more humid Parts are exhaled and wasted; so that there is less of it to be separated in the Kidneys, than is necessary to dilute that high Colour which arises from the solid Particles.

Since Anger is accompanied with *Pulse and* Briskness of Motion, it makes the *Heat in Anger.* Pulse high, swift, and strong, it evaporates much Heat and Humidity, and the Heat will be perceived more increased, but mild and not sharp.

On the other Hand, Sadness is attended with languid Motion, and makes the Pulse slow, languid, and small; but little Heat escapes, and much less Moisture, which is more difficult of Motion; whence the Heat will be felt natural, but in a lower Degree, more contracted, and less diffused. And because from such a sluggish Motion, the Blood becomes unfit for Nourishment, the Body becomes emaciated, and the Eyes hollow, and from the Blood's Distemperature in Quality, a very strange Change of the Countenance from its natural State.

If the Intention of Thought be such *Intention of* as makes less vivid Impressions upon *Thought.* the

the Nerves, then all those Consequences will happen as above explained of Sorrow; but on the contrary, if it excites greater Energy to Motion.

Watching.

But because by Means of Sleep such Particles are added to the Substance of the Body as are fitted for its Nourishment; in the Time of Watching therefore such are defective, or cease to be so added; so much then of them as is not wasted by Perspiration, remains in the Mass of Blood, and gives to it a Redundance of Humours; hence the Complexion and whole Constitution abound with Moisture, and consequently a Dulness of the Looks, a slow Motion of the Eyes, and a Rheum hanging about them; although even all these may happen from Heat in Watching, if such Watching is too long continued, so as to weary the Muscles, and to relax the membranous Parts, so that their Humidities flow through them.

Labour and Weariness.

In hard Labour the natural Moistures are exhausted, whence a Dryness comes upon the whole Body, and the Skin; of which a certain Forerunner is great Thirst, but of that Moisture which is left, the Skin will have some Share, since it is most likely to pass that Way, tho' when there is no Humidity left by Means of such Motion

as fuses the Blood, as in extreme Exercise the Skin, will become dry.

From Adstriction of the Skin it becomes thicker, and more compact, whence the Passage of the Heat more difficult, and consequently at the first Feeling it is less perceivable, and thought moderate; but if the Hand be continued long upon the Skin, that Heat which would otherwise make its Escape, collects in Quantity under the Hand, and enlarges the Pores, whence the subsequent Vapour exhales in greater Quantity, is joined with the preceding, and excites a Perception of a much more intense Heat. But here it is possible to fall into a Mistake, that is, by confounding the Perception of the first Heat with the subsequent, and which may the more easily happen, because a Perception of the first Heat continues upon the Nerves some Space of Time, so as to anticipate in some Measure a Perception of the subsequent Heat. The Urine in this Circumstance comes to be higher coloured by a Retention of Fuliginosities, or solid Particles; but the Body is yet not wasted, because the Blood is not vitiated, and the Vessels are not only not drained, but even over filled, from the Retention of perspirable Matter that

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could

could not pass through such a constricted Surface.

Buboes.

From Buboes the Pulse comes to be affected as before explained from Pain; but from a great Increase of the Blood's Velocity, the Heat is also much increased, yet seems pleasant to bear; yet hence when it comes much to rarify, and thereby cannot suddenly fill the innumerable Capillaries, and the most complicated Vessels about the Head, it collects in the larger Vessels upon the Face, whence they become extended and bloated, and give a very high Colour to the Countenance.

Plenitude.

From the very same Causes, when the Motion of the Blood and Pulse is disordered by Redundance, the Eyes, Face, and Urine grow higher coloured, and the Pulse great and quick.

*Duration 24
Hours.*

Because every one of those Causes which are able to disorder the Pulse may continue for more or less Space of Time; whenever therefore it ceases to produce that Effect in 24 Hours, or thereabouts, there will be a Time given by this Cause commensurable to a *Legitimate Ephemera*; and from the same Error likewise are all its other *Concomitants* to be accounted for, as they have been already explained; the Truth therefore appears of the whole Proposition.

PRO-

PROPOSITION VI.

From the above explained Disorder in the Motion of the Blood being longer protracted, does necessarily follow all the Consequences of a Legitimate Ephemera.

The Patient may sweat, and yet the Cause disordering the Blood's Motion continue, therefore such Sweat does not proceed from the Cause of such Disorder, but from some other Cause whatsoever it be, and consequently the Disorder will be protracted into a longer Time of Exertion. There would no Sweat rise, if the Cause vitiating the Blood's Motion was absent; where therefore that does continue, and Sweat for Reasons before given ought to appear, the disordered Motion of the Blood will also remain, and be protracted beyond the Space of 24 Hours. If moreover through this whole Space the Pain in the Head continues without Cessation, and is longer protracted, therefore the immediate Cause procuring that Pain must also continue, that is, the Tension and Throbbing of the

Protracted sometimes beyond 24 Hours.

H 2

Vessels,

Vessels, or both of them, proceeding from too great Velocity, *Nisus*, Rarefaction, and Heat of Blood, and the Cause producing all these will be yet remaining, that is, a Blood vitiated in its Motion.

What succeeds such Protraction.

By Means of a longer Continuance of this Error in the Blood's Motion, the Heat is more diffused, and all those Consequences already mentioned become necessarily more aggravated; and such Disorders more especially will be continued, which necessarily depend upon a vitiated Motion in the Blood, for two, three, or four Days, or so long as the Cause vitiating its Motion continues, and hath not any Thing particular joined therewith, different from a *Legitimate Ephemera*, besides a longer Duration, and other *Concomitants*, which are altered in no other Respects than in being somewhat more aggravated.

A Simple Synochus and Continuent.

But if the vitiating Cause be yet of greater Influence, all the Consequences of this Distemper will be yet more inflamed, such as are the *Concomitants* of a *Simple Synochus*, and a *Simple Continuent*; which as they are all easily to be explained, and do easily appear from what hath already been demonstrated in the two preceding Propositions, it is sufficient to revise them; and from a greater Energy in the Cause to account

count for all the Affections and Degrees of these Fevers.

Why these Fevers are either *Acmaſtica*, that is, always of the ſame Degree of Heat; or *Epacmaſtica*, always increaſing; or *Paracmaſtica*, always decreaſing; in like Manner may be underſtood from the preceding. For where there is ſuch a Measure of Efficacy in the Cauſe vitiating the Blood's Motion, and ſuch a certain Denſity of Humours, that but juſt ſuch a Quantity of Heat can ſeparate and exhale, the Fever will be of the firſt Sort, always of the ſame Degree of Heat; but where the Quantity of Heat ſeparating from the Blood, and breathing out from thence, is always increaſing, it will be of the ſecond Kind; and where the evaporating Heat decreaſes, of the laſt Kind. But becauſe from ſuch a Reſolution of the Blood, as in this Caſe is ſuppoſed, there may reſult many other Circumſtances, which may neceſſarily give Riſe to other Diſeaſes, as well as a Fever at the ſame Time; and that theſe will eaſily appear from the Doctrines of Diſeaſes, and ſhall alſo further be explained hereafter, when we come to ſpeak of the Blood vitiated in its Qualities, and the Manner of producing a *Synochus*; for theſe Reaſons, I ſay, we ſhall not make

any further Inquiry into them here, because from what hath been already said the Proposition appears in all Respects true.

But we must not here omit one Circumstance relating to an *Hectick*; because the Fault of the Blood's Motion in this particular Case is more especially aggravated, it therefore produces a more lively Heat, and a greater Power of dissipating the natural Humidities, which it attenuates and drives away by Perspiration; the longer therefore this Cause of a vitiated Motion in the Blood remains, its Dryness and Heat will increase after a very great Rate, which will also transfuse into all the Solids a Heat much greater than natural, and waste their Humidities; all which Disorders will remain as long as the original Fault continues in the Blood; nay, although even the Cause which first brought this Disorder into the Blood should cease, yet after the Blood hath obtained such a dry and hot Constitution, the same Consequences will remain, whence the Matter supplying the nervous Fluid will in like Manner be hotter and dryer; whence the Spirit be also more acrid, of greater Energy, and rush with greater *Impetus* into the Fibres of the Heart. This increased Heat moreover of the Blood will

will stimulate those contractile Threads, on which Account likewise the Spirits will be more agitated, the Pulse quick, a wasting of the Flesh, a sharp and continual Heat, which will be intended after Meals, both from an Increase of that Matter from whence new Heat is generated, and from the Acrimony of the already formed Blood, working the new Chyle into Heat; on which depends all the *Concomitants* of an *Hectick*; as shall hereafter be more particularly made appear. Here then is demonstrated what was proposed.

PROPOSITION VII.

A Legitimate Ephemera is a Fault in the Motion of the Blood, produced by a disordered Influx of a Liquid through the Nerves, into the Fibres of the Heart; and this is the first Way of generating an Ephemera, and after the same Manner may an Ephemera of many Days be produced.

Because a *Legitimate Ephemera* is nothing else than a Collection of all those

Appearances which we call the *Antecedents*, *Concomitants*, and *Consequences* of this Fever; for in the preceding Propositions it hath been demonstrated, that all those *Antecedents*, *Concomitants*, and *Consequences*, do necessarily depend upon a Disorder in the Motion of the Blood, which is produced from an irregular Influx of Liquid through the Nerves into the Fibres of the Heart, and therefore that disordered Motion of the Blood is not only the Condition necessary to the Subsistence of a *Legitimate Ephemera*, but is also that very Thing which gives Being to all the *Antecedents* and *Consequences* of it, in the Collection of all which together the very Essence of the Disease consists; it therefore appears, that a *Legitimate Ephemera* is a Fault produced in the Motion of the Blood after the Manner proposed. And because an *Ephemera* of many Days is nothing else but a *Legitimate Ephemera* longer protracted, with all its *Antecedents*, &c. although sometimes not so intense, or aggravated; it also appears, that an *Ephemera* of many Days is nothing else but a Fault in the Blood's Motion, only somewhat more than ordinarily continued from a greater Irregularity of a Fluid's Influx into the Fibres of the Heart. The whole Proposition therefore appears to be true,

true, and here the Manner of producing both these Kinds of an *Ephmera*, from a vitiated Motion of Blood, is said to be the *first* Way of producing this Effect.

PROPOSITION VIII.

The Blood errs in Quantity, from Fulness or Emptiness, and all that is reducible to those two Heads; as to the latter, Hunger, Thirst, all Exercise, whether of the Body or Mind, Pain, Costiveness, Retention of Urine, Evacuation; to the former, hot Meats and Drinks, Drunkenness, Heat of the Season, Continuance by the Fire, or in the Sun, hot Baths, diminished Perspiration, too much Sleep, and a hot Temperament; Crudity belongs to both Distinctions: And from this Fault in the Blood's Quantity does necessarily depend all the Concomitants and Consequences of a Legitimate Ephmera.

That Fulness or Emptiness will vitiate the Blood in Quantity, is manifest from the very Import of those Terms; for by Fulness it comes about that
what-

whatsoever is contained in the Vessels, or the Blood, is greater in Quantity; but by Emptiness, less. Hunger and Thirst must therefore belong to the latter Distinction, since they grow uneasy to us by the Consumption of those Parts out of the Blood, which are necessary to our Nourishment, or by its Diminution in Quantity; all Exercise, if it be of the Mind only, as that takes away a great deal of Spirits, whose Supply from the Blood must thereby be also much exhausted, will be followed by Emptiness; but if it be of the Body also, or of the Body alone, since this employs many Muscles together, it makes a Waste both of Spirits and Blood. To this Class belongs Pain, because it occasions such Reflexes of the nervous Fluid as contributes to its Consumption; and also the Retention of the Fæces in the Bowels, which dries up the Humidities, and the Suppression of Urine as it proves a *Stimulus* by exciting Pain; in like Manner all Evacuations, for Reasons that are obvious at first View. But Crudity belongs to this Distinction only when it is of such a Nature, that the unconcocted Juices do not reach so far as the Blood, but stop in the Mesentery; for when it can arrive to the Blood, it will fill the Vessels with Juices

Juices no ways fit for the Exigencies of the OEconomy, and only distend them, and encrease the Quantity of Blood beyond what's natural. A hot Diet will rarifie the Blood, so as to have the same Effects in distending the Vessels, as if they were in Reality filled with a greater Quantity; the same also will be done by intemperate Drinking, Heat of the Season, Continuance by the Fire, or in the Sun, Baths too hot, and a hot Temperament. A Diminution of Perspiration does in Fact increase the remaining Quantity of Blood, by a Retention of what ought to exhale; and on this Account too much Sleep belongs to Plenitude, because those Parts which are unfit for Nourishment, and hang upon the Fibres, are by that Means not shook away; and moreover because by too much incrassating the Juices, and numbing the Parts, it occasions that the whole Mass of Humours are the less perspirable and fluid, as they are less acted upon by the Solids: and therefore appears the first Part of the Proposition.

In the second Place then, I say, that *Pulse*, all the *Concomitants* and *Consequences* of a *Legitimate Ephmera* do necessarily depend upon the Blood's being vitiated in Quantity; and it hath been already shewn

shewn in the *second Proposition*, that from an increased Quantity of Blood does necessarily result a greater, a stronger, and a more quick Pulse; and on the contrary, in a diminished Quantity; both of which are observed to happen in a *Legitimate Ephemera*. To this it may be moreover added, that in a diminished Quantity of Blood the Pulse may be brisk and quick, that is, when the influent Spirits are hot and copious, although not so much as observed in the *fourth Proposition* above; and when the Cause producing such Pulses is equable, the Pulse will also be so too; and upon the Cessation of that, the Pulse will return to its natural Measures; and in Proportion to its greater or lesser Recedure from a natural Standard, will the Pulse be more or less like to that of a Person in perfect Health.

Urine.

With an increased or diminished Quantity of Blood, will the Quantity of Urine be also increased or diminished; and no other Changes will be made thereby, unless that in an increased Velocity the Colour will be somewhat heightened, by the Augmentation of Heat attenuating and exhaling some of the more humid Parts; or if the Heat is less, or the Blood more viscid, an increased Velocity will detach

detach off the more watery and fluid Parts, and retaining the more gross, render the Urine more crude and white.

Heat and Pain of the Head will ^{Heat and Pain of the Head, and} both be more intense from Fulness, by Means of an augmented Quantity, as demonstrated in the *fifth Proposition*, as also from Exinanition, when most of the natural Humidities are wasted, for then there remains an over-Proportion of stimulating Particles; the same holds good also concerning the ^{whole Body} Heat of the whole Body.

Respiration is also as in the same ^{Respiration.} Place observed, and in Plenitude or Exinanition may in Conjunction with a sharp Disposition of the Juices, be greater and thicker, than when the Motion of a Fluid through the Nerves is only irregular, and the Blood remaining in its natural Quantity; for in both these Cases either more Plenty of Spirits will be separated from a greater Quantity of Blood, and the Brain will be compressed more forcibly than from a natural Quantity; and Exinanition with a sharp Disposition of the Humours, is accompanied with such an Energy and Quantity of Influx, as answers the Deficiency of Matter, and occasions a quicker and harder Respiration to follow. But this may

may also become low and faint, if such Emptiness be either very great, or if it be moderate with such a Disposition of Humours, as gives Spirits of less Energy.

*Accession
without Cold.*

But because it comes to the same Thing, whether true Blood fills up the Cavities of the Vessels, or one that is rarified, yet when the natural Quantity rarifies, and the Cause so rarifying it begins to operate, immediately there is a Perception of Heat only, according to the *fifth Proposition*, and no Manner of Cold or Shivering: And it happens also that there is no Perception of this Kind, when the Blood is diminished in its Quantity, but becomes sharper; and for the like Reason as there recited, does Sweat succeed, when the Cause of such Plenitude or Acrimony ceases. But this is not necessary in *Ephemeræ's* from great Exercise, as many Physicians assert, for the Skin will then be dry, and in such as are extremely fatigued, continue so to its total Termination.

*Termination
with Sweat.*

The other *Concomitants* are as shewn under the *fifth Proposition*, and may without any Trouble be deduced from thence, or from what is here said. If therefore the Cause vitiating the Blood's Quantity continues 24 Hours, all these in like Manner will continue as long; and

*24 Hours Du-
ration.*

and if that Cause persists longer in Exertion, the Heat will also be longer continued, as explained in the *sixth Proposition*; and it may be succeeded by an *Ephemera* of many Days, one or other Sort of the *Synochus*, a *Hætick*, &c. and all these consequential Affections will be intended or remitted in Proportion to the Quantities of Blood, and its Degrees of Acrimony. Wherefore the whole Proposition is true.

PROPOSITION IX.

A Legitimate Ephemera is a Fault in the Quantity of Blood from Plenitude, or from Exinanition; and this is another Way of producing an Ephemera, and by the same Means may an Ephemera of many Days be produced.

In like Manner as in the *eighth Proposition*, a *Legitimate Ephemera* is nothing else, than a Collection of all those Affections which either precede, are joined with, or follow it; and in that it is further demonstrated, that all those *Antecedent*, *Concomitant*, and *Subsequent* Affections, altogether depend upon a Fault

Fault of the Blood in its Quantity, produced either from Plenitude or Exinanition; therefore that vitiated Quantity of Blood is not only the Condition without which an *Ephmera* cannot subsist, but it is the Thing it self that constitutes its very Being, because that same vitiated Quantity of Blood gives Rise to all its *Antecedent*, *Concomitant*, and *Subsequent* Affections, the Collection of all which into one, constitutes the Essence of this Fever; it appears therefore, that a *Legitimate Ephmera* is the Production of a vitiated Quantity of Blood, as proposed. But because an *Ephmera* of many Days is nothing else than a *Legitimate Ephmera* protracted into a longer Space with *Antecedents*, &c. somewhat more intended, tho' not always; it also appears that an *Ephmera* of many Days is nothing else but a Disorder in the Blood's Quantity; only somewhat more aggravated, from a greater or lesser Exinanition or Plenitude. The whole Proposition is therefore true; and this Way of bringing on an *Ephmera* of either Kind by a Blood vitiated in Quantity, is the second Way.

PROPOSITION X.

All the Antecedents to a Legitimate Ephemera vitiate the Blood in its Quantity.

Because Grief and Fear are, or very *Grief and Fear.* probably may be, Hindrances to Motion, therefore all that while such Impressions continue, will there be a less Consumption of Spirits for some Time, but after longer Continuance, a much greater Quantity will be exhausted; and therefore as their Supply is to be had from the Blood, a greater Quantity of such Particles is drawn from thence: Now that Fluid passing thro' the Nerves is a Kind of *Lympha*; consisting of a more viscid Juice, and a Spirit which is very active, and of great Energy; a greater Consumption therefore of such a Fluid will drain also the Blood of its most viscid and most active Parts together, and consequently will render the Remainder both more loose in Texture, and less disposed to Motion; that is, it will be changed and vitiated in Quality.

But this will more easily happen in *Other Affections* other Affections of the Mind, that are *ons of the Mind.*

I of

of greater Energy, for such will not only waste a great deal of Spirits by their sole Properties, but by being accompanied with violent Motions of the Muscles for the most Part, especially in Anger, that in the Solids, and even in the whole Mass of Blood, will be exhaled, whence the Blood will grow more hot, and from a Consumption of its Moistures, grow harsher and dryer; that is, the Blood's Quality will be changed.

Watching.

The same is caused by too much Watching, and that on a double Account; first of all through an over-Quantity of Spirits, which in protracted Watching is elaborated from the Blood, whence the Remainder is left colder and moister than it otherwise would be; and secondly, because in Watching a great deal of Moisture is exhausted from the solid Parts, which they must again immediately draw from the Blood, and render it dryer; which yet is the more easily brought about by an Evaporation of the hotter Particles, whence the Blood being robbed of its Principles of Motion, becomes more chill and dryer, through too great Expence of Moisture, all which happen in long Watching; but after a more moderate Manner, in less protracted Watchings;

ings; whence in both Circumstances the Blood is more or less vitiated in its Quality.

Exercise of the Body wastes its Moistures and Spirits, whence by Means of that Humidity which is drawn from the Blood, the Remainder is left more sharp and active; but if such Exercise is protracted and vehement, insomuch as to waste the greatest Part of the Spirits, the Blood will be yet more dry; which then containing but a small Portion of active Particles that cannot extricate themselves into Action, it will consequently become both colder and dryer; but if such Exercise is more remiss, and shorter, it will then become hotter and dryer.

But because all Pain contracts, and every Contraction presses out of the Arteries and other Vessels what is most fluid, therefore by Pain the more watery Parts of the Blood will be discharged, with others of greatest Fluxility; whence what remains in the Vessels will be dryer, of a fiery and earthy Nature, and they will be in more Liberty for Action, whence the Blood will be more vivid and dry. The same is also the Effect of Evacuation, when they are procured by stimulating; to which Class are reducible Buboës, Inflammations, Retention

of Urine, and Stools; for when the
Fæces of the Bowels are some Time
retained; they grow dry, and absorb
Moisture from the Blood.

Hunger and Thirst. Hunger and Thirst suppose the Blood
vitiated in Quality, and they will still
encrease such Disorder the longer they
are continued; for it is certain that
under such Circumstances there will
be wanting what is necessary to repair
the Blood's Loss, viz. a balsamick
Moisture, such as Lymph and Spirits,
whereupon the Mass becomes a Kind
of coarse Recrement, and earthy.

All hot Things. Because Heat increases by an Increase
of Motion in the Body, and the Vessels
grow tumid, as likewise doth the
same happen from adventitious Heat,
of the Fire, and the like; by such Heat
the Blood rarifies, and is thereby more
disposed for Reception of it; whether
it be therefore from a hot Tempera-
ment, or Season, or Bath, or Diet, or
Drinking, or a sulphureous Crudity that
partakes of a great deal of Heat, or
Suppression of Perspiration of what is
of a fuliginous Nature, like dry Smoak,
that is sulphureous and hot, the Blood
obtains a greater Share of Heat, and
rarifies, and is therefore altered in Qua-
lity. This Effect will an Inflammation,
upon the extreme Parts more especially,
have, as that is attended with an un-
common

*Inflamma-
tion.*

common Fervor of Blood in a particular Part, which is easily communicated in a little Time to the whole Mass.

This also may be the Effect of Ple. ^{Plenitude.} nitude; for as this already supposes a greater Quantity of Blood in the Vessels than natural, its Particles will be more crowded against one another, whereby they will press out or diffuse its Heat, and the whole Mass will grow hotter, rarifie, and exhale its humid Parts. But yet an obstructed Perspiration will more ^{Obstructed Perspirations} readily contribute to this Rarification, Exsiccation, and Augmentation of Heat; whether the perspirable Matter lodges in the capillary Vessels, and thereby straitens the Blood's Circuit, so as to produce the Concomitants of a Plethora; or whether the succeeding perspirable Matter, either from the solid Parts, or Blood it self, does also hinder its Evaporation, and accumulate therewith in the Vessels, whence the Blood grows hotter, dryer, and more rarified.

Further, a sulphureous Crudity joined ^{Crudity} with Heat will dry and heat the Blood; but since it is taken for granted that Crudity is accompanied with indigested Humours, that is, such as are gross, and not easie to be dissolved, when such are introduced into the Blood, the whole Composition will partake of their Nature, become less fluid,

more thick, and compact; and a bare Crudity will do all this by its sole Properties; but when it is destitute of all Heat, it renders the Blood more viscid and cold, like Glue, Slime, or Gelly.

Again, Plenitude and an obstructed Perspiration, although they are not supposed to excite, and raise a greater Quantity of Heat, yet on this Account they vitiate the Blood in Quality, by destroying that Measure of Fluxility as is requisite to its natural State in the Vessels, as all Obstruction and Fullness must croud them, and render their Contents thicker.

Sleep.

But because in Sleep a great deal is taken from the Blood of a balsamick Nature for Nourishment of the Parts, therefore on that Account does Sleep leave the Blood dryer and hotter. Again, because from the same Parts a Sort of aqueous Moisture does rise, which cannot be excluded the Body during its Inactivity in Sleep, but is again absorbed by the Blood, from which in the mean time Spirits do evaporate, a great Part of this comes to mix with the nervous Fluid, and by Reason of its feeble Energy give but very little Motion to the Parts it should invigorate; whence the Blood by too much Sleep will grow more moist and cold than natural.

PRO-

PROPOSITION XI.

From these Faults of the Blood in Quality do necessarily flow all the Concomitant and Subsequent Affections of a Legitimate Ephemera.

Because from Passions of least Energy, ^{From Grief, &c.} or such as slacken the natural Motions, the Blood becomes sluggish, and sends but a small Quantity of Spirits through the Nerves and Arteries, therefore a less Quantity of Blood and Spirits will go to the Heart, and consequently the Pulse become slow, small, and languid. ^{How the Pulse and Heat.} Again, because the Blood is in some Measure fused, but hath yet little Heat, it cannot transpire very plentifully, and that which does perspire will be in Separation from such Parts as should contemporate its Acrimony, and consequently will it seem sharp.

For this very Reason, that is, from ^{Leanness and Hollownes of the Eyes.} such a Solution of the Blood that it becomes more sluggish and cold, it comes about that the Body cannot be nourished by Juices preternaturally disposed, whence all the Parts will waste by the Escape of those Particles which

have been Nourishment, and for want of a new, or a sufficient Supply; hence the Eyes will sink inwards, for want of Nourishment to fill up their Cavities, and to prevent such an Appearance.

Urine.

The Urine will be cruder for want of due Motion in the Blood, and a lesser contractile Force in the Membranes, whereby it comes about that the most liquid Part only is separated, and flows out; and if the Humours obtain also a greater Dryness, the Urine may then be lesser in Quantity, and much higher coloured.

Its Accession,

The Accession will be without any at all, or but with a flight Perception of Cold, because the fused State of the Blood cannot confine the Particles of Heat; and if it can do so for a very short Space of Time, (in the Manner as shall hereafter be explained) there will be a very short and transient Shivering.

Termination,

Its Termination in like Manner will be without any Eruption of Humidity upon the Skin, if either the Blood hath contracted the highest Degree of Dryness, or if all its humid Parts are so attenuated in the Fever it self by Motion, as to fly away by Perspiration.

and Duration.

If therefore this Constitution of Blood continues for 24 Hours, and then returns

turns to its natural State, there will so long be a Fever, or there will be joined with this Disorder in the Quality of the Blood, all the *Concomitants* of a *legitimate Ephemera*; but if it be longer protracted, all those Affections which necessarily depend upon it will likewise be protracted.

But because from Passions or Affections of the Mind of greater Energy, From Anger, &c. there is made a greater and more frequent Influx of Spirits through the Nerves to the Heart, and the Blood is rendered dryer and sharper, therefore the nervous Fluid and Blood will pass through the Heart faster and in greater Quantity, and the Pulse will be greater, quicker, and stronger.

The Heat, in Proportion to its different Degrees, renders the Blood more or less humid, and more or less able to restrain and temperate its Energy, and therefore will it be more or less, sharper or heavier, more sparing, more plentiful, more mild, or more pungent. The like will hold as to the Urine, for the greater, the more active, How the Pulse and Heat. and efficacious the Heat is, that will be in less Quantity and higher coloured; or if Humidity more abounds, in more Plenty; more thin and crude; in the first Case, because the Intention and Activity of the Heat hath wasted a great

great deal of the natural Moistures, and of what remains all will not be separated; and therefore those solid Particles which are secerned with the Urine, will be in greater Quantity than can be diluted by so small a Portion of Fluid; but if Humidity does abound, a great deal of it must be separated in such an accelerated Velocity; but of the more solid Particles, which require a less Degree of Motion for their Separation, but very little; whence the Urine is more copious, more watery, and more crude.

Accession.

Under this Species of Passion likewise, the Accession must be without any Perception of Cold, if we have Regard only to the greater Energy of a free Heat; but if the remaining dry Parts can in any Manner restrain its Exertion but for a small Space of Time, or of themselves impress a greater Motion upon the Nerves than the Heat it self can do, as it passes out of the Body, there may be excited a small Perception of Chilliness, which will very suddenly again vanish.

Deceffion and Duration.

Its Deceffion as above, either with or without Sweat; and as this Fault in the Blood continues 24 Hours, or longer, will all those Affections as usual be of the same Duration.

From

From the whole it demonstratively appears, that the *Concomitant Affections* of a *Legitimate Ephemera*, do necessarily depend upon those Disorders of the Blood in Quality as have been here recited, and which we have shewn to proceed from Watching, and other Accidents, even to Obstruction of Perspiration; for in every one of these the Measure of Cohæsion between the constituent Particles of Blood is vitiated, and upon such Defect while somewhat is loosened from them which exerts it self more than in a natural State, others in the mean time may operate variously; all which, according to the Method of reasoning observed both here and in the preceding Propositions, will easily conduct us into the Knowledge of whatsoever belongs to the *Concomitants* of a *Legitimate Ephemera*, necessarily arising from the same Causes.

But if a Diminution of Perspiration be looked upon as somewhat causing Plenitude, it will necessarily produce all those Effects mentioned concerning a *Legitimate Ephemera*, in the *eighth Proposition*; but if as leaving a dryer Constitution of Humours, mixed at the same Time with Sulphur enough to give a greater Heat to the Blood, there will be a more copious and brisk Influx of Spirits through the Nerves, and the Pulse

From Dimi-
nution of Per-
spiration.

How the Pulse

*Heat.**Urine.**Sweat.*

Pulse will be greater, stronger, and quicker. The Skin being obstructed, less Heat will be able to get through it, whence upon a short and slight Touch it will appear to be but little, but upon a longer Continuation of the Hand upon the Patient, by a continual Increase of igneous Particles at the Surface, the Heat will grow more intense, and by the additional Property of Dryness seem very sharp. The Urine, for Want of a sufficient Moisture to dilute the grosser Particles, will appear high-coloured, and by Reason of a greater Motion and Heat during the Fit, but small in Quantity; but on its Declension it will be more copious, especially if the retained perspirable Matter can be diverted that Way, by a Diminution, for Instance, of that Velocity, which had propelled the Matter suited to go off by Urine beyond its proper Outlets, into the Extremities of the Arteries; and this seems to be the very Necessity why Sweat, when the Matter to make it is in Readiness, breaks out in the Declension, because then there being a Retardation of the Blood's direct Velocity through the Arteries, there is Time given for its lateral Secession out of the common Current, into those oblique Canals destined for its Separation.

When

When therefore a Diminution of Perspiration causes Fulness, although the Body during such a short Space as a 24 Hours Fever, is very little, or not at all nourished, its Decrease will not be apparent to the Senses, which otherwise might be perceived upon a Defect of Nourishment; for the obstructed perspirable Matter keeps up a Distention of the Parts equivalent to true Nourishment, and on that Account prevents Extenuation, and the Eyes from sinking in hollow. Its Accession may also under this Circumstance be without any Perception of Cold, if the Diminution of Perspiration hath nothing joined with it that can hinder the Diffusion of Heat; or there will be but a very slight Perception of Cold if the Heat is in some Measure restrained, if the Nerves are yet invigorated with as much Motion as at other Times; and this will continue for one Day or more, in Proportion to the Duration of the primary Disorder.

What hath been said about an obstructed Perspiration, may be easily applied to Crudity, and the other *Antecedent* Affections, whence appears the first Part of this Proposition; for what belongs in general to an *Ephmera*, as difficult Respiration, Pain in the Head, &c. they will easily be understood, partly

ly from the Mechanism of the animal Operations, partly from particular Diseases, and partly from what hath been already said above; but from all these Deviations of Nature does necessarily arise the *Subsequent* Affections of a *Legitimate Ephemera*, as will easily appear from what hath been said in the *sixth* Proposition; therefore the whole of this stands demonstrated for Truth.

PROPOSITION XII.

A Legitimate Ephemera is a Fault in the Quality of the Blood, and that manifold, as the Qualities of the Blood have in the two preceding Propositions been shewed to arise many Ways: whatsoever other Ways there are of producing an Ephemera, may by the same Means produce an Ephemera of many Days.

The Demonstration of this depends upon the same, as in the *seventh* and *ninth* Propositions.

PRO-

PROPOSITION XIII.

A Legitimate Ephemera is a Fault in the Motion, Quality, or Quantity of the Blood, or in some or all of these, continuing for one Day, from their respective Causes; but an Ephemera of many Days is that very Fault protracted for a longer Space of Time.

Because the Blood cannot be vitiated but in its Motion, Quality, or Quantity, or in some, or all of these, and there is no Fever without some Disorder of the Blood; therefore there cannot be an *Ephemera* in which the Quantity, Quality, or Motion of the Blood is not vitiated, or some or all of them: but every *Ephemera* is nothing else than a Collection of all its *Antecedent*, *Concomitant*, and *Subsequent* Affections, and this Combination we have not only shewn to belong to all the recited Disorders of the Blood, but to depend necessarily upon them even in a *Legitimate Ephemera*, so as to protract it for 24 Hours Space, but in an *Ephemera* of many Days to a longer Time; both Kinds therefore of an *Ephemera* can-

cannot only not subsist without the recited Disorders of Blood, but in those very Disorders consists their very Nature, and constitutive Essence, and therefore a *Legitimate Ephemera* is a Disorder of the Blood in Motion, Quantity, or Quality, or in some or all of these, (for it easily appears from the foregoing, that the nervous Fluid may be primarily vitiated, or that the Motion of the Blood may be primarily vitiated; and that it may be vitiated in Quantity and Quality; or in Motion and Quality, &c.) continuing for one Day from their respective Causes; but an *Ephemera* of many Days, is the same Fault protracted for a longer Time, which was to be demonstrated.

PROPOSITION XIV.

Whatsoever does precede a Simple or a Continent Synochus, does vitiate the Blood in Motion, Quantity, or Quality, and from this Fault do necessarily result all the Concomitant and Subsequent Affections of both Kinds.

The Antecedents in a Simple Synochus. Since all the *Antecedents* to a Simple Synochus, are the same as to an *Ephemera*, and

and it appears from the preceding Propositions, that all these vitiate the Blood in Motion, Quantity, or Quality, the first Part of *this* that regards a *Simple Synochus* must be true; even as it is restrained by Physicians to that Distinction only as comes from Plenitude; but such a Restriction is not just, since all its Affections also subsist with the Motion and Qualities of the Blood being primarily vitiated: But although that should be allowed, it yet appears from the *Antecedents*, that the Blood may be primarily vitiated both in Quantity and Quality; thus a diminished Perspiration not only fills the Blood-Vessels, or disorders the Blood's Quantity, but it also may happen that in a lesser Degree of such Diminution, the Heat of the Blood may likewise be intended, and all those Affections produced which necessarily accompany a *Synochus*; thus the Suppression of hot Exhalations, the Hemorrhoids, Menfes, and all *Antecedents* which increase the Blood's Quantity, both add to its Heat, and generate Spirits of greater Energy; and whether or no the Fault is from an increased Quantity of Blood, a vitiated Quality, or a Motion vitiated primarily from a Fault in the Spirits, the Truth of the Proposition is equally certain.

Antecedents
to a Synochus
continens.

In like Manner as the *Antecedents* to a *Synochus continens*, are altogether the same as to a *Synochus simplex*, the Motion, Quantity, and Quality of the Blood will by them be vitiated; and all those which have been recited further than in a *Simple Synochus*, as hard Labour and Exercise, vexing Cares, &c. will be accounted for by what hath been explained amongst the *Antecedents* to a *Legitimate Ephemera*. Obstructions also of the Skin, Liver, and other Parts, in the same Manner likewise disorder the Blood in Motion, Quantity, or Quality, as does a Diminution or Obstruction of Transpiration; all the *Antecedents* therefore to both Kinds of a *Synochus* vitiate the Blood in Motion, Quantity, or Quality, as laid down in the Proposition.

Concomi-
tants of a
Simple Syno-
chus.

Since further the *Concomitants* of a *Simple Synochus*, are the same as with an *Ephemera*, but more distinguishable and aggravated, it appears that they all depend upon the same Causes, but operating with more Energy, viz. a greater Influx of Fluid through the Nerves, a greater Augmentation in the Quantity of Blood (since a diminished Quantity has nothing to do here), or a greater Change in its Quality, that is, more fused and inflamed. But as all these may easily be recollected from their

their own Appearances, as well as from what hath been already said, and more especially if the Cause be according to most Physicians assigned to a *Plethora* only, we shall not be any more particular thereupon. But as the same Things may happen from the nervous Fluid being first in Fault, so as to impress a greater *Impetus* of the Blood through the Heart, and greatly to rarify it; all the same Affections may then ensue, and in the same Manner, as from the Blood primarily vitiated, when it is greatly heat; for the whole Body will look red, and be as it were blown up by a rarified Blood, the Veins will be turgid, and the Vessels extended on all Sides from an universal *Nisus* of the Blood against them outwards; hence the Passages into the musculous Fibres will be closed, whereby they cannot be contacted, that is, there will be Inaptitude to Motion; the Head will be pained from a Compression of the distended Arteries; Respiration must be also difficult and frequent, by a continual Tension of the membranous Parts from the Pain in the Head, and a greater Protrusion of Blood through the Lungs. Sleep will, or seem to, be more deep, for the same Reason, and Images of Red, (if Relations are true)

having Resemblance to the Colour of Blood, continually floating through the Imagination; the Temples will beat from the Blood crowding through their Arteries; the Breast will seem squeezed and contracted; and the Uneasiness of such Compression and Heat, render the whole Body very restless: But when the preservatory Cause of the Fever comes to be weakened or diluted, so that it breaks through in Sweat, or in such Hemorrhages as cool the Blood, lessen its Quantity, and give more Room for the Remainder, that it may rarifie without Distention of the Vessels, then the Fever will terminate. All the rest may be understood from a *Legitimate Ephemera*, and what hath been more particularly said in the *sixth* Proposition, in the Explication of an *Acmaistica*, *Paracmaistica*, and an *Epacmaistica*.

Concomi-
tants of a
Synochus
continens.

The *Concomitants* of a *Synochus continens*, appear only to be in a more aggravated Degree, and therefore depend upon the same Causes operating with more Energy; and their Necessity of so doing may be understood from what hath been already explained. As the Heat herein is more intense, it will more dry the solid Parts, and thin and evaporate the Humidities of the Blood; whence both Liquids and Solids will

will be exhausted of their sufficient Moistures, and as the Heat is more intense, a Necessity also of Watching. In like Manner if from the same Cause that Humidity is evaporated that should pass into Spittle, there will be a Dryness of the Mouth only; but if that which should moisten the internal Parts, then the Patient will be thoroughly thirsty; the same of which will likewise happen if the Blood is clogged with Viscidities, or any gross Matter that obstructs those Vessels destined for the Separation of Moisture.

A Shortness of Breath, and Difficulty of Respiration, will also arise, for the same Reason as in a *Simple Synochus*. But if, by the Motion and Heat of the Blood, these Humours, which are separated from it, and carried into the Cavity of the Stomach and Intestines, can, when they are mixed, ferment, froth up into Bubbles, and then suddenly burst with Force, the Belly during their Formation will swell, and when they break away, will make a Noise: But when the Humours which are separated at the Glands of the Skin, obtain also a Power of fermenting, they will irritate the Fibres, and generate little Blotches of a Diversity in Colour, according to the Dispositions of such Humours, and become livid,
K 3 black,

Duration.

black, &c. and Humours will easily ferment, when they stagnate from Obstruction; and the Canals will easily obstruct when the Blood is either too viscid, or crowded too fast in its Motion. Both these Kinds of a *Synochus* will last so long as the preservatory Cause subsists, and that may be for three, four, or seven Days in a *Simple Synochus*; and in a *Synochus continens*, as it already appears by Observation, from seven to fourteen Days.

Consequences to a Simple Synochus.

From the same Disorders of the Blood do in like Manner arise all the Consequences of a *Simple Synochus*, as after a *Legitimate Ephemera*, as may appear from what hath been already said: But if the Fault of the Blood be by its Increase in Quantity, that can in no wise be diminished by Art, all those Affections will ensue which depend upon an augmented Quantity of the Blood; and from an augmented Quantity joined with an aggravated Heat, will it happen as already observed of a *Legitimate Ephemera* passing into a *Simple Synochus*; and these Inflammations will be most considerable in those Parts where the Heat of the Blood is most intense, and its Afflux very great, as in the Lungs; or where its Motion is much retarded, as about the Throat, within the Skull, and the Pleura,

Pleura, &c. on which Account do easily arise a *Peripneumony*, a *Pleurisie*, a *Quinsie*, a *Phrensie*, or any other Distemper that hath its Rise from an augmented Quantity of Blood, and an Increase of Heat conjointly.

These in like Manner do succeed a *Synochus continens*, as also an Hemorrhage at the Nose, or any other Parts of the Body where the Blood is too much accumulated, or occasions too much Irritation, so that it at last breaks thro' the Vessels, or so distends them as to ouze through their Pores: An Asthma likewise, as observed in the foregoing Propositions: An Itching, and Defluxion from the Nose, caused by the same Protrusion and Erosion of Blood: A Dimness of Sight from so great a Crowd of Blood compressing the Nerves, that due Flux and Reflux cannot be made through them, or so straitening the Humours of the Eyes, that through them cannot pass the Species of Objects; or by Reason of Viscidities in like Manner obstructing the Nerves, or preventing due Influx of Fluid into them: Flashing before the Eyes, either from lucid Species occasioned by a greater *Impetus* of Blood, or from Light separated from the Blood within the Eye by too great a

Consequences to a *Synochus continens*.

K 4 Pressure,

Pressure, as it is wont to happen when we forceably shut the Eyes.

*Passes into a
Causus.*

Further, because a *Causus* is nothing but a more aggravated *Synochus*, as it will easily appear by comparing the *Antecedent*, *Concomitant*, and *Subsequent* Affections hitherto explained, and as it will be immediately demonstrated; therefore a more protracted *Synochus*, that is, a *Synochus* with greater Aggravations will easily pass into a *Causus*. In the last Place a crude Urine, about the Beginning, is an Argument that such a Solution of the Blood as is made in that Velocity, is less suited for the Separation of those Parts which are capable of an oblique Secession, or such as are gross, and unapt for Motion, whence the most fluid only get through; and as such are with Difficulty comminuted, they easily make Obstructions, and therefore a yet more crude Urine denotes Death; but a red and a thick one Health, because with that are expelled also the thicker Parts, broke by the Force of Circulation, fine enough for Ejection. The Proposition is therefore demonstrated.

PRO-

PROPOSITION XV.

A Simple Synochus is a Fault in the Motion, Quantity, or Quality of the Blood; or in some or all of these; produced from the same Causes as a Legitimate Ephemera, but somewhat more aggravated, and operating for a longer Time: And a Synochus continens is that very Fault, but arising from more aggravated Causes.

All this is manifest from the preceding Propositions, if the Demonstration be conducted as in the seventh and ninth; and from all together it is put out of Question, that a *Simple Synochus* is nothing else but a more aggravated *Ephemera* of many Days; and that a *Synochus continens* is also an *Ephemera* of many Days, but more intended than a *Simple Synochus*; and that both these Kinds are to be brought about by as many Ways as an *Ephemera* of one or more Days; which was to be demonstrated.

PRO-

PROPOSITION XVI.

All those Things which precede a Causus, or a burning Fever, vitiate the Blood in Motion, Quantity, or Quality, and upon the same Fault do necessarily depend its Concomitant and Subsequent Affections. What a Causus is.

Antecedents. Although it may appear to all who turn back to the *Antecedents* of a *Causus*, that from them is produced a Fusion in the more humid Parts of the Blood, with their Evaporation and Consumption, so that the Blood is more strictly said to be vitiated in Quality; yet because from the same *Antecedents*, as appears from our Explanation of the *Antecedents* to an *Ephmera*, the Influx of Spirits through the Nerves may primarily be vitiated, and by a Consumption of Humidity the Quantity of Blood may be lessened; and that whether the Influx of the nervous Fluid into the Fibres of the Heart, or the Quantity, or Quality of Blood, are primarily vitiated, and the Fever arises from

from this or that immediate and preservative Cause, it is manifest that the *Antecedents* to this Fever ought to be considered in every Capacity of Exertion wherein they are able to vitiate either of these Conditions in the Blood. And it may be sufficient to hint this only here, because the Existence of such *Antecedents*, and the Manner of their Operation in vitiating the Blood, either in Motion, Quantity, or Quality, will appear from what hath been said concerning an *Ephemera*.

Since therefore whether the Motion, ^{Concomi-} Quantity, or Quality of the Blood be ^{tants.} primarily vitiated, this is one most constant Effect that its Humidity is wasted; therefore will there remain a greater, more free, and a more active Heat, restrained by no cold or viscid Humours; whence it will exert it self on every Side with the greatest Energy against the sensible Fibres of the Patient, or any other Person feeling him, insomuch that it will seem even to burn the Flesh ^{Burning heat.} for Want of Humidity to temper it. Since also the whole Mass of Blood partakes of the same Quality, it will always communicate the same Perception of Heat, whence there will not be felt any Exacerbation; or if at some-^{Without Ex-} times there is a small Variation, nei-^{acerbation.} ther the Patient, nor any other Person,

son, will be able to discern it, since it will be so extremely little in Comparison to that continual Heat, which is always intense and burning.

Thirst,

The Thirst is likewise inextinguishable, and will be in the highest Degree aggravated, not only in the Mouth, but throughout the whole Body, so as to produce a Sense of total Dryness; which will also continue because the intense Heat exhales all the Liquids that are taken in, or suffers that to strain through the Body, which otherwise would lodge therein, by the constituent Particles of the animal Juices being entirely broke in their natural Cohæ-sions, and in the highest Degree of Solution. Hence in like Manner is the

*and dry, black
Tongue.*

Tongue dry and rough; dry for Want of Moisture, but rough by the Hardness of the *Papillæ* which cover its Surface; for when these are destitute of their proper Moistures, they grow stiff, and disjoined in their Points, whereby they seem to the Finger sharp and pungent, as when it is drawn over the Teeth of a Comb. It looks black, because by Means of its great Dryness the solid Parts cannot contract, so as to move the constituent Fibres, whence the Particles of Blood, and those the most dry too, have the less Motion, and in a Manner stagnate near the Super-

Superficies, where the more fluid Parts of Heat exhale through; and as these are tinged with a deep red, when they are accumulated and crowded together they will appear black.

Further, since the Blood is thus sharp, *Gnawing in* and the Heat so liberal, the Juices also *the Belly.* which are naturally derived into the Intestines, will also be sharper, and less yielding, or more at Liberty for Action and Efficacy; whence the Nerves of the Stomach and Intestines will be more sharply vellicated, and a Sense of gnawing occasioned in the Belly: And be- *Black Stools.* cause the Stools are tinged with Bile, the more this hath a Mixture of an aqueous Humidity, it will be the more yellow and diluted; but the more it is deprived of it, the more deep will its Colour be, and inclining to greenish or black; in such a Disposition therefore of the Blood, where almost all Moisture is wanting, the Bile must also be separated extremely adust, or tending towards a black Colour.

It is certain also that Watching de- *Watching.* pends upon the same Heat and Dryness, since Sleep requires that there should be some Moisture in the Juices, which is at that Time to be added to the Nourishment of the Parts, whence a Privation of Sense; that therefore does not happen, when such Addition can-

cannot be made, and it cannot be made, when there subsists no Humour to be added.

*Deprivation
of the Under-
standing.*

Deprivation of the Understanding is a *Concomitant* of this Fever, either because the Nerves being too tense from a more than natural Heat and Dryness, cannot excite such Tremors as where the Understanding is right; that is, they excite none, or not all, or those not regularly; or because from too much Heat and Dryness of the Blood, the Spirits generated are too vivid and perspirable, so that in their Passage they have not sufficient *Impetus* against the Membranes or Coats of the Nerves; or because those Spirits are destitute of their aqueous Vehicle, whence they do not adequately fill the nervous Canals, nor make the Impressions of any Species forceably enough to be perceived, and conveyed along those minute Passages; or any other like possible Causes, comporting with the Laws of the OEconomy.

*Respiration
difficult, &c.*

Respiration is rendered difficult by too great a Protrusion of Blood upon the Lungs, which in the present Circumstance being also very hot, greatly rarifies therein, and distends them on all Sides, whence the Ramifications of the Wind-Pipe unfold or open with much more Difficulty, to remove such

such an increased Pressure; and hence also to get rid of that uneasy Sensation of Heat and Tension, we strive to breath oftner, which likewise without our Endeavour will happen, by Means of the Sharpness and Activity of the Blood and Spirits, oftner distilling into the Fibres and Muscles which act in Respiration: And in Regard to the Force of Respiration, it will be very great, both by Reason of such an Influx which more strongly contracts the Muscles, and distends the Breast to a greater Capacity, and makes a greater Respiration, and by the Assistance of an Endeavour to enlarge the Respiration, in drawing in as much Air as possible, in Hopes to remove that troublesome Sensation upon the Lungs, which is seated in the Blood-Vessels.

Continual Breathing with the Mouth open, in Order to force out, if possible, that inward Heat, and to give more Room for the Ingress of cool Air; or to remove that troublesome Sensation of a Pressure upon the Lungs, or to receive more conveniently a Refrigeratory from the external Air, to assuage that which to the Patient really is, or seems, hot to the very Bottom of the Lungs. But this may likewise happen from a Convulsion of the digastrick Muscle,

*Breathing
with the
Mouth open,*

Muscle, as it appears from the Nature of a Convulsion, which will continually or alternately draw the Mouth open, as such Convulsion is continual or alternate.

Inquietude.

The Body will be also restless, and toss up and down in Bed, either by Means of convulsive Contractions of the Muscles, sometimes in one Part, and sometimes in another, or by too free Excursions of the Spirits, now rushing inordinately into one Nerve, and then into another; or for the Conveniency of changing into a cool Place, which the Patient hath not before made hot; and such tossing about will be continual, because the Cause of desiring fresh Cold will always continue, which is a burning Heat.

*Pulse hard,
&c.*

The Pulse will be hard from the Dryness of the Artery, and its difficult Restitution inwardly against such an *Impetus* of swift and rarified Blood.

Fiery Urine.

The Urine is of a Flame Colour, and hath nothing of Sediment in it, since by Means of its increased Velocity, or difficult Motion of its more solid Parts, or both together, it cannot recede laterally, so as to enter the secreatory Organ; but that may notwithstanding pass so which is most Fluid, and in Company with the more active, rigid Particles that are separable, and which
give

give to the Urine its thin, shining, and fiery Colour.

This Fever will last so long as this Duration and Termination.
State of Blood continues, and until the peccant Matter can, by the accelerated Motion of the Distemper, or by Medicines, be purged away, by its being reduced to this or that Nature as renders it separable through the Intestines, Glands of the Skin, or Kidneys, &c. A *Causus* therefore terminates either by Stools, Sweat, Urine, Vomitings; or Abscesses, if the peccant Matter is deposited upon any Parts of the Body where it putrefies, &c.

Because then in a *Causus* there is an Consequences.
exceeding and burning Heat, where therefore it seizes a Person, and the Quality of Cold would otherwise most predominate, every Thing will be most changed from its natural Course; and in old Persons, and a cold Constitution of Air, Temperament, or Season of the Year, cold Things do most exert their Qualities; if a *Causus* therefore seizes a Person under such Circumstances, Nature will be most perverted from her accustomed Course, and will therefore with the greatest Difficulty be brought to it again, or Death will follow: But if this *burning* Fever comes on in more temperate Seasons of the Year, as in Autumn, its Rage may be moderated,
L and

and a Fever produced with a less Degree of Heat and Dryness, such as a *Quartan*, either *continued* or *intermitting*. Death also may be the *Consequence* of a *Causus*, as *Hippocrates* asserts, when it is attended with a racking Pain of the Belly, or any other Part; because since in this Case the Fever is supposed to come from Pain, it will be so violent, and so agitate the Body, as to exhale all its Humidity; and if therefore the Pain be still protracted longer than any Humidity remains, the Fibres will either break, or be unable to move by Reason of their Dryness, and consequently Death must ensue. From the whole therefore it appears, that the *Antecedents* of a *Causus* do vitiate the Blood in Motion, Quality, or Quantity; and that from such Disorder do necessarily follow all its *Concomitants* and *Consequences*, as in the first Place proposed. It appears therefore that a *Causus* without a Period may be reduced to an *Ephemera* of many Days, and is only the most intense Degree of that Fever from the same Causes, but in a more aggravated Manner exerting themselves; and that it may be produced as many Ways as *that* can; the whole therefore is demonstrated.

PROPOSITION XVII.

The Antecedents to an Heetick may vitiate the Blood in Motion, Quantity, and Quality, but its Concomitants and Consequences have a necessary Dependance on its vitiated Quality only: And what is an Heetick.

The first Part of this Proposition abundantly appears from what hath been already said concerning the *Antecedents* to an *Ephemera*, and where almost every Thing is recited which is reckoned *Antecedent* to an *Heetick*; and it is also there demonstrated by what Means and Necessity they come to vitiate the Blood in Motion, Quantity, or Quality: But most of the *Antecedents* to an *Heetick* do so plainly of themselves point out their Manner of Operation, that their Necessity of disordering this or that Affection of the Blood, will abundantly appear without any Recourse to the preceding *Propositions*; and therefore may we take the first Part of this to be demonstrated.

We now further assert, that the *Concomitants* and *Consequences* of an *Hectick*, have their necessary Dependance only on a vitiated Quality of the Blood. For because an *Hectick* is a certain Disorder that by long Continuance passes into a Habit of that Kind, as hath nothing in it unnatural, but Excess in Heat and Dryness; the Essence therefore of this Fever is not to be fetched from its first Cause, and that which primarily occasioned such a Disposition to Heat and Dryness; but in a certain Confirmation of that Heat and Dryness in such Manner, that although the Cause first inducing them ceases to operate, yet those Qualities continue in their Substance and Efficacies. Notwithstanding therefore a Heat and Dryness of Blood may be increased by Means of a vitiated Influx of Fluid through the Nerves, and in like Manner by a Consumption of its Humidity, the Blood may be vitiated in Quantity, so that the Remainder shall be necessarily hotter and dryer: And because this Fever is so constituted in a Habit of Heat and Dryness, that although there is not supposed either an irregular Influx of Fluid through the Nerves, or a vitiated Quantity of Blood, but that they are returned from the Cause which first vitiated them into a natural State, yet this

this Heat and Dryness will remain in the Blood; it is therefore manifest that the *Concomitants* and *Consequences* of an *Heftick*, are not necessarily joined with a Disorder in the Blood's Motion or Quantity, since a Combination of them together, that is, the Fever it self may subsist after such Disorders cease, or if they never were in Being.

That the *Antecedents* to an *Heftick* do so vitiate the Blood in Quality, that it becomes hotter and dryer, appears from the preceding Explanations; it only therefore remains to be demonstrated, that the *Concomitants* and *Consequences* of an *Heftick* do necessarily depend upon a vitiated Quality of the Blood, in Order to such a suitable Definition of an *Heftick* as may include a Combination of all its *Antecedents*, *Concomitants*, and *Consequences*, necessarily depending upon their respective Causes; and which will not be any very hard Task to perform.

Be it then taken for granted that the Blood is hotter and dryer than natural, and that it is become habitual by a long Continuance; such a Heat therefore will become familiar to a Person, and its Excess will be made tolerable by Custom, especially when it is not very intense; as with Uneasiness we bear the first Changes to

How the Sense of Heat to the Patient.

the extreme Heat or Cold of Seasons, yet they soon grow tolerable by Use; so likewise we are at first very sensibly affected by a sudden Change of Cloaths to thicker or thinner, though after some Time it grows unheeded; and the like of many other Instances. The Patient himself therefore will not discern with Uneasiness any Heat greater than natural, and will hardly discern himself to be Feverish. But if another Person lays his Hand upon the Patient, there will be perceived at first a slight Heat, as arising from the Flesh much diffused, and thereby of no great Energy, or to the first Touch but weak; but by a Continuance of such Application, and a Repetition of its Occursions against the Hand, it will become more sensible, and as the Heat rises from dry Humours, it will be altogether destitute of such moist Vapours as would check its Activity, whence it will seem sharp and pungent. But if this Heat be yet more at Liberty, and in greater Quantity, so as to give a more discernable and vivid Perception to the Touch, in the original Source of hot Humours, the Arteries, than in the circumjacent Parts, a greater Degree of Heat will be felt in the Arteries than any where else. And as hot Irons thrown into cold Water excite in it an Heat, or cold

*To a Person
feeling the
Patient.*

*In the Arte-
ries.*

cold Water grows hot by being thrown upon live Coals; so the Chyle formed from a fresh Meal, as soon as it comes into the Current with an hot Blood, is every Way agitated in its constituent Particles, and broke in its Cohæſions, so that the included Heat breaks thro' it; whence the whole Maſs of Blood, in Conjunction with the influent Chyle, raises a greater Quantity of Heat, and communicates a stronger Perception of its Qualities, both to the Patient, and the Hand of another applied to his Flesh, some Time after a fresh Meal, whensoever taken in, than in any other Space; and such an Intention of Heat will continue as long as fresh Chyle drains into the Blood, for all that Time a new Heat will be breaking forth; but after all the fresh Chyle hath got into the Blood, and been wholly broke in its Cohæſions, so as to have let out all its igneous Particles, then the Patient will revert to that former State of Heat which he possessed before the Supply of a fresh Meal, and in which he will continue until a Repetition of the same Cause.

*Its Intention
upon eating.*

From the Doctrine of Pulses, and what hath been already said in the foregoing *Propositions*, it is manifest that the Pulse must be changed by an Increase of Heat, and become greater and

Pulse.

quicker; for by a greater Heat of the Blood it will be more rarified in the Arteries, whence a greater Pressure upon the Brain, and a more frequent and copious Influx of Fluid through the Nerves into the Fibres of the Heart, and consequently a greater and quicker Pulse, which will continue the same Measure, so long as such an additional Fervor in the Blood continues; and from thence it will return to its wonted, though diseased State, which is small and quick; small by Reason of a lesser Quantity of Blood and Spirits, but quick because the Spirits, which are generated in such a lax Constitution of Blood, are also in themselves more fluid, so that although they distil into the contractile Fibres in less Quantity, yet their Motions will be quicker, and likewise the Pulse correspondent thereunto; for that increased Celerity which is obtained from a thinner, and a less Quantity of Blood, occasions its Stay under the Finger applied to an Artery to be much shorter.

Because the natural Colour of the Urine depends upon a due Contemperature and Mixture of its solid and fluid constituent Parts in a diseased State, therefore the Urine will be like to that of a well Person, as long as there can be maintained a Contemperature like

to that of an healthful State. When then in a greater Heat and Dryness of Blood there is given a greater Quantity of dry, and a lesser of humid Parts, on this Account the Urine will be higher-coloured than natural; but because by the Activity and Force of these two Qualities, Heat and Dryness, when they are in full Liberty, there is continually a great deal of Humidity absorbed from the solid Parts, which they constantly act upon, and waste; some Parts of that may join with the adust Humours, so as to make a Mixture and Contemperature like to what is natural, and give to the Urine the Appearances of one in a State of Health; and this is the Reason why the Colour of Urine in *Hecticks* is like to that of well Persons. And this also suggests to us the Reason, why, upon the Aggravation of an *Hectick*, arising to its *second Degree*, the Urine becomes greasy, or as if Oil swam upon its Surface like a Cobweb; for by such intense Heat every Thing is set in Fusion that is purely fat, or lighter at least than Urine, but cohering in its Parts like all fat Substances, and may therefore have a Resemblance to what it is not in Reality.

Further, because through a Poverty *Heavy to Motion.* of Blood, the Fluid in the Nerves too

must

must likewise grow defective, all those Faculties which the Body enjoys by Virtue of either must grow languid, and the Instruments of Strength will fail, or will at least impair in Quantity, and by a greater Laxity of Texture waste in Transpiration; whence an *Hectick* Patient must be feeble, and slow to Motion.

*Heat in the
Hypoconders.*

That Heat which is remarkable in the Hypoconders, proceeds from the same universal Cause, but in the right Side more particularly, on Account of the *Liver's* lying most there, which being the Seat for Bile, such a Humour in this Circumstance will be very sharp and hot, beyond what it is in a natural State; although this *Viscus* also extends into the left Hypoconder, and there also excites considerable Heat: The like also happens in the *Spleen*, wherein it is certain that the Blood is prepared for its better Separation of Bile when it comes to flow into the *Porta*; and those Animals growing more salacious, and more ravenous, which have their *Spleen* taken out, is a most certain Argument, that by such a Loss there is somewhat left in the Blood that makes it more sharp, and which, when separated in the Liver, is naturally ejected with the Bile. This Humour therefore in the *Spleen* will in like Man-
ner

ner grow more sharp, and excite a greater Heat. To this also may contribute the acrid Juice of the Stomach, and the rarifying boiling Juice of the *Pancreas*; but the rest both of *Concomitants* and *Consequences* are in themselves manifest.

From the whole therefore it appears, that all the *Concomitant* and *Subsequent* Affections of an *Hectick* do necessarily depend upon the Dryness and Heat of the Blood, or upon its vitiated Quality; and likewise that its *Antecedents* do so vitiate the Blood in Quality, that it loses its Humidity, its Heat becomes more free and active, and its dryer Parts also more disunited in their Cohæsions; all those Things therefore that vitiate the Blood's Quality in such Manner, that it acquires thereupon greater Heat and Dryness than natural, and that too of such a Nature as passes into the very Habit, and subsists after its generating Cause ceases, all those Things, I say, will cause an *Hectick*; and its very Essence consists in this very habitual Disposition, which is nothing else but a greater Heat and Dryness than natural, protracted and changed into an Habit; nor is there any other Way, as is manifest from the very Nature of the Thing, of producing this Distemper.

But

But it is yet worth while to observe as to these Causes, if we have Regard to those which may possibly happen, although they never or seldom do so, it may chance that the first Disorder of all may be in an Excess of Heat and Dryness, or in an hot and dry Temperature, not in the Blood, but in the Solids themselves universally; for it is possible that these of themselves may be suddenly, or by Degrees, defrauded of their natural Moistures, either from some peculiar Make of the Constitution, or from some external Cause, in such Manner that the opposite Qualities of Heat and Dryness may take Place; and when this Error is once contracted by the Solids, it will easily and necessarily be communicated to their contained Fluids, so as to enter into intimate Contact with their constituent Parts. But on these Conditions an *Hectick* will arise that will soon terminate in an incurable *Marasmus*; for these very solid Parts, which otherwise might be repaired by Juices in their natural State, do now themselves destroy that necessary Property in the Juices, whereby the Disease comes to be fatal on a double Account; if then this Fever is to be denominated from the Part that is primarily affected, it is not to be pronounced an hot and dry Temperature

ture of Blood, but of the solid Parts; which as it also may be the Cause, there is another Way, possible at least, of producing an *Hæctick*.

PROPOSITION XVIII.

From a Blood vitiated in such Manner that it becomes more thick and viscid, and its hot Parts not so easily disengaged by the natural Force of Circulation, these necessarily follow: Heaviness of the Body; Listlessness to Motion, with a Decay of Strength; Chilliness of the extreme Parts, which by Degrees spreads all over the Body, but least in the Head, the same increasing to a very great Sense of Cold, accompanied with Trembling and Shaking, and a Perception of Cold only, or of some other Force that is pungent, compressing, and as it were even breaking the Bones: During this the Pulse is weak and slow, but sometimes likewise quick, yet so depressed, that the Artery seems to be lost, and sunk lower into the Flesh, and so contracted, as if the Artery were shrunk into its own Center, and sometimes quite imperceptible to the Touch. After this an Heat seems to be felt, but its Progress is opposite to that of the Cold; for as that first seized the

the extreme Parts, and by Degrees passed to the Center, so the Heat arrives at the Extremities last, which shall even continue cold after the whole Trunk begins to glow with Heat; but sometimes the Cold and Heat are felt alternately, before a Person passes into a settled Heat. On the Increase of Heat, the Pulse grows stronger, greater, and quicker, and the Artery seems to rise nearer the Surface, and open it self, and will be felt to beat, where in the cold Fit it could not be at all perceived. The cold Fit is over in some Hours Time, but the hot one lasts for one, two, three, or more Days. But from the same Disorder of Blood it may necessarily happen, that a Feverish Heat may first appear without any preceding Cold, that its Continuation may be for one, two, three, or more Days, and that from its Attack it increases to a certain Height, after which it decreases; and it is to be observed, that this Heat obeys the same Rules of Progression as in the first Case supposed, and that on its first Attack the Pulse is weak, low, and for the most Part unequal, so as not to beat always with the same Force and Quickness; but on the Heat's Increase, it becomes greater, quicker, and stronger; but this Inequality may also happen in the Case first proposed.

Because the Blood is supposed to be rendered more thick and viscid, it will therefore be rendered less fluid in its grosser Parts, and the more viscid will be less suited to flow uninterruptedly along the Coats of the Arteries, and therefore it will not be so fast propelled forward by the contractile Force of the Heart, where it will retard in its Passage, and as it were crowd the Vessels, and by Degrees bring on a Perception of Weight. From this *Lentor* that is supposed in the Blood, it also follows as a necessary Consequence, that the Secretions therefrom will be made with more Difficulty, because the Particles to be discerned will be more closely entangled in those viscid Cohæsions, and as it were more strongly bound up, which therefore, in Order to their Disengagement, require a greater *Impetus* of Attrition between the Blood's constituent Particles; and since such Attrition depends upon the Blood's Velocity, where it flows slowest, there will be the greatest Resistances to any Separation; and since of those Parts to be separated from the common Mass, those are of the most Importance which contact the Muscles, by being partly discerned in the Glands of the Brain, and partly from the Arteries immediately into

Whence
Weight of the
Body.

Listlessness to
Motion.

*Decay of
Strength.*

into their elastick Fibres, therefore the Muscles in this Circumstance will be less contacted, that is, there will be less Strength, whence a Difficulty, Sluggishness, and Inaptitude to Motion, and every Thing of that Nature, insomuch that a Person so seized, will on all Sides seek for Support, and want to lie down.

Whereas therefore the Blood grows hotter by Motion, and that by no other Means than as in such Motion its constituent Particles strike against one another with greater Force, and thereby break off and separate from their former Cohasions, whence the Heat gets more Liberty, and diffusing it self on all Sides, affects the Organs of Sensation against which it occurs with a greater Perception. On a double Account therefore in this State, the Particles exciting Heat meet with a Difficulty of Disengagement, both by Reason of a slower Motion in a viscid Blood, and the Nature of its Viscidity, which resists the Separation and Attrition of its Particles, whence the Heat is more strongly restrained and entangled. The least Heat therefore will be separated, where the Velocity of the Blood is least; and the less Quantity of Heat will yet be separated in those Parts, wherein, to a diminished Velocity of Blood, is added a great-

*In what Parts
chiefly.*

greater Degree of Viscidity, from whatsoever Cause such an Increase of Viscidity proceeds. Because therefore in every Section of an Artery the Velocity of the Blood decreases, in Proportion to their Distances from the left Ventricle of the Heart; consequently there must be the least Velocity in the capillary Arteries: but not so that this diminished Velocity is in the same Degree in every Capillary, but where they are smallest, and at greatest Distances from Branches, that are smallest also in their Origin; for although even in those Ramifications that are immediately from the Heart, or from the Trunk of an Artery very near it, the Blood's Velocity is much less than in the Trunk it self, yet it is there much greater than in the Capillaries from Ramifications of Arteries very distant from a large Trunk, or the Heart it self.

But if these capillary Arteries terminating near the Heart, happen to be upon Parts constantly in Motion, and to be distributed through them in Plenty, they will be so affected by their Motions, as to give a much greater Quantity of Agitation to their circulating Contents; whence the Blood's Attrition and Solution, with the Disengagement of its Heat, will be much more promoted, insomuch that very

*Not in the
Heart or
Lungs;*

But in the extreme Part.

little of the Sense of Cold will be perceived therein; and of this Kind are the Heart and Lungs, and therefore will there be no Cold at all, or very little complained of in those Parts: But since in the Extremities of the Body there is hardly any Pressure from the Muscles, and contractile Membranes, the Blood's Velocity will be there least of all, not only by Reason of the greatest Distances from the Heart, but for Want of that Compressure which the Arteries in those Parts have not the Benefit of.

Further, because the *Impetus* and Velocity of the Blood decreases in those Sections of the Arteries most distant from the Heart, both on Account of its Occursions and Resistances, the Decrease of its Velocity from Resistances will be yet much greater in such a vitiated State of Blood as renders it more viscid, for it will flow with much the more Difficulty, from the Stops of its most glutinous and adhesive Parts against the Coats of the Arteries; and on that Account will also its Velocity be much retarded. Add to this, that as the Blood is supposed to be thicker, it will easily, for that Reason, totally obstruct the capillary Arteries; not by Particles of Blood disjoined from the rest, wherein some flow near the Axis of

of the Vessel, and leave others behind them in Contact all round its Sides, which are either less suited for Motion in themselves, or more apt to be detained in Contact with the Membranes, but by all and every Part that circulates near the Sides, and adheres to the internal Superficies of the Arteries, and by that Means gives greater Obstruction to all further Motion through them, till its whole Circuit is stopped; and this is, for all the Reasons already recited, the more particularly effected in the extreme Parts, because the Influence of external Compression is there much the least. But there are also very many Things which naturally give great Diminution to the Blood's Velocity, and in this Circumstance it seems almost altogether to be stopped; but if it arrives to its greatest Degree of Thickness and Viscidity, its Motion then wholly ceases. In the present Case then let it be supposed, that by this Property only so much of the Blood's Velocity is diminished, that its igneous Particles cannot get into Liberty enough to excite Heat; hence may a very great Degree of Coldness be felt in the Extremities. But this Sensation will *Not in the* notwithstanding be never able to reach *Head.* the Head, even although there are a great many capillary Arteries about it;

for there they run cross one another very often, and empty into each other, from whence the same Particles of Blood strike oftner against one another with some Degree of *Impetus*, and whence so much Heat may be set at Liberty, as to preserve the Brain and circumjacent Parts in their natural State of Warmth, and which it can for this Reason never be said perceptibly to recede from.

*Its Extension
all over the
Body.*

Because the Blood vitiated in this Manner obstructs in the capillary Arteries; the Time therefore being given of its compleat Circuit once through the whole Body, a lesser Quantity of Blood will flow through the Arteries into the Veins, than is wont to pass through them in that Space of Time; and therefore during that whole given Space, in which the Blood is supposed to finish one compleat Circuit, the Blood must flow slower thro' the Veins than naturally; and consequently in every Contraction of the Auricles of the Heart will there be less Portion of it pass out of them than in a natural State, and that less Portion will less fill the Arteries, and occasion a less Attrition of the Particles of Blood against one another, and a more languid Diffusion of Heat. There will likewise be a weakned Contraction of
the

the Heart, by Reason of a lesser Influx of Spirits into its Fibres, when they come to be separated in the Brain from a thicker Blood, and also a lesser Velocity of the Blood it self, by Means of its Viscidity through the coronary Arteries, on both which Accounts there will be less Attrition, and less Diffusion of Heat; and as this gradually makes its Progress further than the Capillaries, the whole Mass will be under some Sort of Stop; and since it is supposed to be in such a State of *Lentor* and Viscidity, that it cannot by the *Impetus* of its natural Velocity be duly comminuted, much less will it be so when flowing with a diminished Force; and therefore will the Perception of Cold extend it self also to other Parts, and seize the whole Body. And yet not only in the Time of a compleat Circuit, but in any given Space, does the Blood flow in less Quantity out of the Arteries into the Veins, than otherwise it would do naturally in the same given Space; in Case that through the Arteries more or less obstructed, some thinner Parts of the Blood do not supply the Defect of such a retarded Velocity; but this can hardly be expected to happen in a Velocity so much retarded, as here is supposed from a weakned Contraction of the Heart.

*Accompanied
with pricking
&c.*

If further the Matter obstructing the Heat's Diffusion is of that Nature as to vellicate, stimulate, and as it were prick the Membranes, there will at the same Time be a Perception of Cold accompanied with a Pungency; and if it be very gross, so as to fill the Capillaries, and quite stop them up, and if the animal Spirits are carried through the Nerves with great Difficulty into the Muscles, there will be caused a Sensation, which we express by bruising the Flesh, or breaking the Bones themselves, and the like, as will appear from the Doctrine of Weights, Fractures, &c.

With Tremors

Again, as it is necessary to the Regularity of Motion in Parts enjoying Antagonist Muscles, that such a certain Quantity of nervous Fluid and Blood should flow into each Muscle, in order to give them equal Powers of Expansion, whensoever therefore the Quantity of Fluid into either of these Muscles is greater than what flows at the same Time into its Antagonist, one will be contracted and the other relaxed; but this natural Quantity is to be had only from a Blood of a natural Fluidity, so that whensoever it is more thick or viscid than natural, as it flows in Arteries with greater or lesser Velocity, according to its Measures of Viscidity in these Parts, the
Seps

Separation of its proper Fluid into the musculous Fibres will be more copious in one Muscle than another, which therefore will render their motive Powers unequal; and because by Means of the Blood's *Lentor*, or its Scarcity in Quantity, that Fluid which is necessary to contract the Muscles, distils but very sparingly into the contractile Fibres, the Contraction of the Muscles must consequently be very weak; that is, there will be a *Tremor*, a frequent Motion of the same Part, and a very feeble Restitution of it to its desired Posture. But moreover from the Coldness of the Parts the nervous Fluid may uncertainly be interrupted, in such Manner as to make it flow sometimes more plentifully into one Muscle than into its Antagonist, and at others less; or this Fluid may be so interrupted by the distended Arteries against its Canals, that it cannot flow in due Quantity into this or that Muscle, at the same Time that it naturally fills its Antagonist; with many other Circumstances of like Nature. But if by the Continuance of a greater Compression from a *Lentor* of greater Tenacity, there is yet made a stronger Expression, so that the rarifying Fluid hath a less Check in its *Impetus*, from Parts more sluggish and unactive, there will ensue

a vehement *Tremor* and Concussion of the whole Body, so that sometimes one and sometimes another Part is more strongly shook, and in the same Part sometimes one and now another Muscle, without any Equality or Certainty.

The Pulse

weak,

small,

slow,

*sometimes
quick,*

Yet since all this while the Heart continues in Motion, when it is supplied with a lesser Quantity of nervous Fluid into its contractile Fibres, the Pulse will be weak; if a lesser Quantity of Blood than natural passes through the Auricles and Heart when they are contracted, the Pulse will be small; and when such a diminished Quantity flows with a diminished Velocity, it will be also slow, and the Spirits instil more slowly into the contractile Fibres: But because it is possible to happen, that in the Secretion of a nervous Fluid, by Means of a greater *Lentor* in the Blood, when it arises from a greater Pressure, and a stronger Cohætion intangling the more subtle Parts, the Spirits may be separated more sharp; it will then occasion the Pulse to be weaker through a diminished Quantity of Spirits in the Nerves, but also more quick at the same Time from their greater Activity and Subtilty, and their more quick and frequent Instillation into the Fibres. The Pulse
also

also may be unequal, both as to the *unequal*,
Times between its Beats, and the
Strength of it against the Finger ; for
since these Affections of the Pulse are
as the Conditions of the circulating
Blood, it is not to be expected that
they should be always the same, be-
cause they depend upon the uncertain
Measures of Blood differing in Degrees
of Fluxility and Velocity ; but the
Times between every Pulsation, are as
the Distillation of the nervous Liquid
into the Fibres of the Heart, and that
is varied as many Ways as a Blood
unequally Fluid is capable of passing
through the coronary Arteries, and
those in the Head. But because the
Blood is contracted by Cold, or con-
fined within less Space, and the Mem-
branes also shrink from the same Cause,
when a lesser Bulk of Blood flows
through the Arteries than natural,
the Arteries will shrink inwards,
and that Part of them towards the
Skin draw from it, so that the Pulse
will be as it were contracted and bu-*contracted*,
ried ; and the Artery will, to a dili-
gent Observer, seem to have grown slen-
der, by its shrinking on all Sides to-
wards its own Center. But because
the *Impetus* even of a natural Blood
decreases continually, and is much
more diminished by the disordered
Qua-

none at all.

Quality above supposed and explained; as often therefore as a Blood is given of such a *Lentor*, that by the *Impetus* impressed from the Heart it is not propelled so far as those Trunks of the Arteries where we feel to examine the Pulse, or that it hath not Force enough there to thrust their Coats outwards, then there will be no Pulse at all discernable in those Parts.

How Heat ex-
erts it self.

Since likewise the hot Particles of the Blood are so restrained by the viscid ones that they cannot perspire, if therefore they come under such a Degree of Pressure, joined to the *Nisus* of such Particles to disengage themselves, that exceeds the Force of Cohæsion in the implicating Parts, the Heat will at length break forth, exert its Energy, and become perceptible to the Organs of Sensation. When therefore a viscid Blood adheres in the Capillaries, and there is a continual Afflux of a fresh Quantity, there will at least be accumulated so much as to obstruct them, whence upon a double Account will it come to be strongly and continually pressed upon, both from the following Blood, and from that contractile Force in the Arteries, which makes them resist all Distention. Such Compression therefore continually increasing, its *Momentum* will at length exceed that in
the

the Cohæſion of the viſcid Parts, whence the Heat will get diſengaged, and ſtrike againſt the Nerves with a perceptible Impulſe; but after ſome Portion of Heat hath got at Liberty, it greatly facilitates the Eſcape of the Remainder by its Activity and Motion on all Sides, and ſubduing and breaking the Viſcidities, not unlike what the Fire does to Wood laid upon it; and hence the Heat comes eaſily to diſſuſe it ſelf all over.

But becauſe the Heat then only comes to break forth, when the Quantity of Contraction exceeds the Power of Implication from Viſcidity, ſuch Contraction will be ſo much the greater, where the Blood's Velocity is greateſt, and the Velocity is greater in Ramifications near the Heart, than in thoſe which have their Riſe further off; and therefore the Force of Compreſſion, exceeding that of Implication, will ſooner happen in Arteries near the Heart, than in any other that ariſe at a further Diſtance from it; that is, the Heat will be felt in the extreme Parts after it hath ſome time warmed the Parts near the Heart, inſomuch that the Limbs ſhall be cold after the Trunk glows with Heat, and ſuch Cold will continue until the Force of Contraction exceeds that of Implication, and the Heat

Heat is let out by an increased Agitation of the Blood's constituent Particles, and a Commination of its Viscidities. But since these opposite *Momenta* are very uncertain, and not reducible to any knowable Measure, and that it cannot be also told how long the Cold will last in the Limbs after the rest of the Body grows warm, it can only be in general pronounced, that the Cold will remain so long in the Limbs as the Viscidity there continues to implicate and fold up the Particles of Heat.

*Heat and
Cold alter-
nately.*

But if the Blood happens to be unequally viscid, so that some Capillaries contain Blood of less Cohæſion, or easily letting out its Heat, while other Parts circulate that which is more cohering and viscid, the Heat will not be perceptible in each Place at the same Time; but sooner where the less co-hæſive Blood passes, and later where the more viscid circulates; whence Heat and Cold will alternately succeed each other for some Space. The same likewise happens, if Blood of these different Qualities is at the same Time contained in different Parts of the same Artery. But further, because the Blood is more compressed in the Capillaries than in the Trunks, therefore after a Portion of Blood hath got its Liberty
in

in the Capillaries, and its Heat hath diffused it self, there will be Room made for the Reception of more Blood out of the greater Vessels, and the Spaces made by the Action of Heat between the Particles, will yield to an Influx of fresh Blood into such Capillaries; if then such influent Blood, which is supposed viscid, is not immediately rendered fluxile by the Action of that Heat which it finds already at Liberty in the Capillaries, by a Pressure of fresh Blood still from the Heart will such Arteries be again crowded, and the Heat will be again so much implicated as not to be perceptible, and therefore in the same Place will there immediately follow a Sense of Cold, whether it be particular or all over the Body; after which, by the same Necessity as before, will return a Diffusion of Heat; to which, if what hath been already explained, happens another Succession of Cold, and so on alternately, there will for some Time be perceived Successions of these two Opposites.

After much Heat hath been disengaged with such other Particles as are most disposed to Separation on an invigorated Compression, and more fluxile, the Blood will thus pass into the Veins, where the Heat will get yet more Liberty, and be more active, and

*increasing,**persisting,**decreasing.*

and therefore will it agitate the Blood which it finds in the Veins on all Sides, and by greatly heating and rarifying it, will again further break its Cohæſions, and ſet at Liberty all the igneous Particles contained therein; whence will be excited a very intense Heat, and free Motion and Occuſion againſt the whole nervous Syſtem, and through them a great Perſpiration and Diffuſion; and that continually, both out of the Veins from the reſluent Blood thro' the Lungs into the Heart and Arteries; and in that Blood which hath not yet paſſed out of thoſe Arteries into the Veins, will there be excited the ſame Heat and Rarification, and the Augmentation will be yet faſter. But this Augmentation of Heat will no further continue than a new Quantity of igneous Particles can be ſeparated from the Blood, both in the capillary Arteries and their Trunks, as alſo in the Veins; but as the Heat continually perſpires, it will ſeem to remain in the ſame Degree, as long as it is not waſted in Quantity enough to let the Fever ſink, and be unable to affect the Senſe of Feeling ſo perceptibly, as to exert a more remiſs Warmth, which, by a Continuance of Perſpiration muſt happen, and conſequently the ſame Quality grow more languid.

How

How far the Increase, Height, and Decrease of the Heat may be protracted, cannot certainly be determined; but so far at least we may venture to assert, that it will be of the least Duration, when the *Lentor* of the Blood hath some Mixture with it of an aqueous Viscidity, that is, what may be soonest dissolved, and rendered fluxile; for in this Case the Blood will adhere to the inner Coats of the Arteries, but as soon as ever the Heat begins to diffuse, and make more Room for the succeeding Blood, such Adhesions will be deterged away by its *Impetus*, and the Arteries quite cleared of all beginning Obstructions by the Briskness of a Current exceeding such Resistances, and able to excite a Heat greater than natural: But if this *Lentor* of the Blood be joined with the Quality of Dryness, and makes as it were a dry Viscidity, that is, one that is the least disposed to Fluidity, then although the Heat first at Liberty does make more Room for the succeeding Blood, yet because this Viscidity adheres to the Arteries with such Obstinacy as not to be removed by the perfluent Stream, and the succeeding Blood fills up the whole Capacity of the Artery, whose Parts nearest the Superficies are already stuffed with a dry tenacious Matter, the

the Blood must flow through with great Difficulty, and be so shook and comminuted, that a much greater Plenty of Heat than what is natural will break loose, and give a very intense Perception of it to the Senses.

*Duration of
the cold and
hot Fit.*

According to the different Degree therefore and Quality of this *Lentor*, the Increase, Height, and Declention of the Heat may be of different Durations, and the hot Fit only be protracted for one, two, three, or more Days, as before observed; from whence, and what hath been already demonstrated, the Duration of the cold Fit is very uncertain; and this likewise depends upon the different Degree and Quality of the *Lentor* in the Blood, whereby it is sooner or later conquered, and the Heat given a Liberty for Diffusion.

The Pulse,

Because therefore upon the succeeding Heat the Blood is rendered more free, fluxile, hot, and rarified; therefore the Arteries will be the more filled, and consequently dilated outwards, so as to be more felt at the Surface, and rise as it were upwards; and as they become fuller, the Pulse must be greater; and that they are in Reality fuller is manifest, for upon such Solution of the Blood a greater Quantity of it returns into the Veins, and the Pulse will be also stronger; further, because the Blood is
hotter

hotter than in its natural State, the ^{greater,} Heat will stimulate the Heart beyond what it is wont naturally to feel, and a greater Quantity of Spirits will be derived into its Fibres, whence they will be more strongly contracted: Again, when a greater Quantity of Blood is diverted to the Brain, and that too is of a more lax Cohæſion, a greater Quantity of Spirits will be generated, and as they will be also hotter at the ſame Time, they will exert themſelves with the greater Energy, or contract the Fibres of the ^{ſtron} Heart more ſtrongly; and this they do more efficaciously, becauſe the Blood it ſelf, from whence they are generated, is likewiſe hotter and ſharper: And when the Spirits diſtil more copiouſly and more frequently into the contractile ^{and mor. quent.} Fibres of the Heart and Muſcles, the Pulse on that Account muſt be more frequent. But if the Pulse in a cold Fit ſhould altogether diſappear, either becauſe the Blood does not reach ſo far as thoſe Arteries where we examine for it, or becauſe its Diſtention of them is imperceptible, therefore the Blood's Velocity being again reſtored, by the Means already explained, it will arrive again to theſe Parts, and diſtend them ſo much as to excite the uſual Pulse; which will increaſe until it becomes great, ſtrong, and frequent, as already ſaid.

N

said. That all which ought to be demonstrated in the first Part of this Proposition, appears from our Explanation of the Hypothesis.

Heat without
any previous
Cold.

In the second Place then let the Blood be vitiated with a *Lentor*, not much unlike what is already supposed; that is, one that is viscid and thick; but in such a Degree, that by the Force of its natural Circulation it may be reduced to such a Quantity of Heat as may be sufficient to answer that which is natural, or but little, if at all, receding from the Measure of Heat by Nature required. In this Case, I say, it will happen exactly as proposed in the second Place. For because the Blood is supposed to be more viscid than natural, therefore it will be retarded in the Capillaries; but then as it is supposed by the natural Course of Circulation to be dissolvable into such a Laxness of Texture as will be sufficient to diffuse Heat equal to what is natural; although therefore it is so retarded in the Capillaries, it will not yet produce a Perception of Cold, for even where it is retarded it meets with Compression, and Attrition enough between the Blood's constituent Particles, to let so much Heat escape as is here taken *ex Hypothesi* sufficient.

But

But because in the first Part of this *Proposition*, the retarded Parts of the Blood are more and more compressed, that is, the *Momentum* of Compression is successively greater and greater; if therefore by any Part, or Parts of such Force, of all which collectively the whole *Momentum* is compounded, the Blood can be broke into Particles sufficient to keep up a natural Heat, as by *Hypothesis*; by the whole *Momentum* collectively must there be a much greater Quantity of Heat produced, which will flow out of the Arteries into the Veins, be much more diffused, and exert a much greater Commotion, Rarification, &c. or it will much more heat all the Parts of the Body as it perspires through them, and give a greater Perception, to the Organs of Sensation, of its Qualities.

In like Manner the Heat will increase while the rest of the Mass flows through those Arteries half obstructed by the viscid Parts of the preceding Blood adhering in its Passage; for hence will there be stronger Compression and Attrition, whence a greater Quantity of Heat will escape.

In this State of greatest Heat the Body will continue, until the diffused Heat perspires, or joins it self with the rest of the Blood, and makes a perfect

Combination therewith; and it may perspire not only by Evaporation thro' the Blood-Vessels, but also by its Ex-
pence in muscular Motion, and the Generation of Spirits. But after the Heat remits, either by Perspiration, or its Combination with other Parts of inferior *Moment*, so that its Decrease is even manifest to the Senses, the Fit is then said to be going off, or in its Declension so long as, by a continual Diminution, it is returning to its natural State.

Duration.

But how long a Time is necessary for the Augmentation, Height, and Declension of the hot Fit is very uncertain, for this altogether proceeds from the Diversity of that *Lentor* which is supposed to be in the Blood, and the Time in which the fused Heat can perspire, or join it self to the rest of the Mass; and from the Time wherein the *Lentor* adhering to the Arteries can be wore away, and derived into the Veins; since from its Occursion and Pressure the perfluent Stream is continually excited into a greater Heat than natural; but the Time of its Continuance is uncertain to be determined, by Reason of a greater or lesser Force of Cohæsion in the adhering Matter; whence only thus much can in general be asserted, that as in the first Part so here, the Duration of the Heat may be pro-

protracted for one, two, three, or more Days, according to the Continuance of the original and preserving Cause, or a Cause persisting to act for one, two, three, or more Days; and concerning this Duration of the hot Fit, both in the first and last Place, we shall more diligently examine in the following Proposition.

But because also in this second Case *The Pulse as* some Part of the Blood adheres in the *first* capillary Arteries, by Means of its *Lentor*, therefore the Blood passes from the Arteries into the Veins in a lesser Quantity than natural, and consequently is there less of it than natural in Readiness to fill the Auricles upon every Contraction, whence a small Pulse. *Be-^{small}* cause also from such diminished Quantities of the common Mass, there must be a lesser Quantity of Spirits separated into the Fibres, which also will the more difficultly be separated by Means of the Blood's Viscidity, therefore a diminished Quantity of Spirits will be derived from the Nerves into the contractile Fibres of the Heart, whence they will restore themselves more weakly, and thereupon render the Pulse weak; and further, if with this diminished Quantity of nervous Fluid be joined its natural *Lentor*, or a *Lentor* greater than natural, by Means of the

*slow,**frequent,**unequal.*

viscid Blood from whence it is secerned, the Pulse will then be also slow. Yet if from the Blood's *Lentor* it comes about that only the more active Spirits are separated into the Nerves, their Influx then into the Fibres of the Heart, by having a greater Liberty of Motion, will be more frequent, whence the Pulse too will partake of the same Property; but if, lastly, the Spirits flowing into the contractile Fibres of the Heart, and the Blood passing its Ventricles, be in uncertain Measures, then the Inequality of *this* in Quantity, and of *these* in the Times of their Influx, will also make the Pulse unequal, as explained in the first Case: But in the Increase the Pulse will be likewise greater, stronger, and more frequent, as before explained; and therefore the whole Proposition is manifest.

PROPOSITION XIX.

The same being granted as before, that Lentor which produces a Sense of Cold by its Adhesion in the capillary Arteries, is at length washed altogether from thence, and carried into the Veins, against whose Superficies it moves without Interruption, as also through both Ventricles of the Heart,

Heart, and the Trunks and greater Branches of the Arteries, until it is again brought into the Capillaries, where it adheres as before, and undergoing again the same, is at length a second Time washed through into the Veins, whence returning by the same Circuit as before into the same Capillaries, it comes to make many Circuits after the same Manner. Now if in its Passage through one, more, or all these Canals, the Lensor is neither diminished nor increased, nor becomes more or less fluid, in the same Time that the cold Fit seized the Patient in its first Attack, it will also observe in the following; if its Quantity increases it may return later, as also sooner, or at the same Time, all which will likewise happen when the Quantity of the Lensor is diminished, according as are its Degrees of Resistance to every such Change of its Quantity greater or lesser; the faster the Lensor is reduced to a natural Fluidity, it will hasten the Accession of the cold Fit, but when more viscid, it will retard it, although it exists but in a very small Quantity. The Time between each Attack may be one, two, three, or more Days; and between every Paroxysm, after the hot Fit is over, ought to be some Interval, wherein the Patient seems perfectly well, or in a natural State, but it is not yet absolutely necessary that this

should always happen. But it may also chance for the cold Fit to come on with all its Attendants, so that other Accessions may answer thereunto, both as to the Times of their Attacks, and their Attendants every Day, or every second, or third, &c. But in the Interval between every Attack of either Kind, there may happen other Insults, attended with Cold and other Concomitants, so as not to suffer the Patient to be but very little free, although after every one, returning even every Day, some Interval of perfect Health may succeed. From this Disorder of the Blood even Death it self may ensue, which most commonly happens in the cold Fit, but that not always necessarily. On the other Hand, this Lensor that produces a Sense of Heat is not wholly cleared away out of the capillary Arteries, but that Part of it which is most fixed and dry, will always remain in the Arteries, after its more yielding Parts are carried away into the Veins; this slowly passes by the Superficies of the Coats, and is at last carried through both Ventricles of the Heart, the Lungs, and other Passages quite round into the capillary Arteries again, as it was before taken Notice of concerning that Lensor that produces a Sense of Cold, and it recurs every Day, every second, third, &c. as it was also observed of that.

But

But in this they differ, in that the Lensor which produces Cold leaves the Patient quite well between its Insults, whereas that producing Heat never leaves a Person quite well, but a new Paroxysm or Insult returns before the preceding is quite off. From this Disorder of the Blood likewise does Death sometimes ensue, and that in the Accession of the Heat, but this not neither necessarily happens. It may also come about that the Lensor which produces Cold may be changed into another which will excite Heat; and è contrà, This may be turned into That; one is more reducible into a natural State, and the other more easily terminates in Death: And moreover it may happen, that in the Interval between two Insults of that Lensor producing Heat, there may be an Attack of Cold from its proper Lensor yet remaining in the Capillaries; and hence may arise a Disorder that partakes of both. But in like Manner may the Interchangings and Periods of these Lensors be so ordered, that what recurred with Cold every Day, shall recur also with Cold every other, or every fourth Day, that of every fourth Day return every other, or every Day; and so likewise of that Lensor which recurs with Heat.

Be-

The Lensor Because the capillary Arteries which
producing Cold are crowded with a *Lensor* producing
is wholly pas- Cold, will be greatly distended and
sed into the distracted in their constituent Fibres,
Veins.

by the repeated Protrusion of a succeeding Blood, when the Heat diffuses and perspires, such Distention and Distraction will abate; they will therefore endeavour to restore themselves to a natural State, by an Exertion of that Faculty in their Restitution and Contraction, by which they were distracted and thrust outwards, as it happens necessarily to all elastick Bodies whatsoever; and on this Account there will arise a great *Nisus* inwards, and the Arteries will contract themselves for other Reasons, than because the evaporated Heat has left more Room inwardly: For this *Lensor* is not supposed quite so dry, that it can absorb also the Humidities from the Membranes, so that they may lose their Powers of Restitution, or is it become so hard in it self as to have formed, in some Sort, Canals no Ways yielding to the Contact of the interior Superficies of the Arteries, which could not but hinder their Restitutions. Yet because these cannot be restored but by an universal Return of all their Parts inwardly, such Return cannot be without changing the Disposition

sition of that *Lentor*, which is in Contact against every Point of their internal Superficies; while therefore the Arteries contract, or are in their Restitutions, every Particle of the inclosed *Lentor* must change its former Contact, so that if in the same Time some Power is superadded which moves transversely to this, and gives an *Impetus* direct or parallel, as near as can be, to the Axis of the Canal, it will easily continue its Progress without any Resistance from such Contact; and for this Purpose is in Readiness, the Pressure and Afflux of a subsequent Blood; this *Lentor* therefore will be removed from its AdhæSIONS to the Arteries; and on this Account too the more easily, because upon the Restitution of the Arteries inwardly, there is not only by their circular Contraction made a Separation in the Contacts of the included *Lentor*, but by the Protrusion of the Particles of Heat into the Spaces they have left, they will be thrust nearer to the middle of the Canal, and thereby come more within the Power of the circulating Stream, so as to be with that quite carried away; and as it is not supposed either totally dry, or so as to rob the Arteries of their Humidities, it will be wholly disunited from them, as much in one Part as in another;

ther ; and when it is disjoined from the Coats of the Vessels, will its Conveyance by the common Stream, wherever that passes, become necessary.

And flows in them nearest their Sides.

Wherefore when the *Lentor* is thus brought into the Veins, and the Blood is become more fluid, yet both these will not flow with the same *Impetus* ; and it will be as in all Currents and mixed Streams conveying Particles of different Gravities ; that is, the more Liquid will be most swift, and flow nearest the middle of the Stream, as those which move with more Difficulty and Slowness will be thrown nearest the Sides, and therefore the *Lentor* in the Veins will be also nearest their Sides.

Its Cohesion in the Veins least.

When therefore this *Lentor* is supposed so great, that it cannot be forced away by a single Contraction of the Heat out of those Arteries where the Blood flows with its usual *Impetus*, but that there is need of more Contractions, by whose collected Powers may arise a Force sufficient for the Purpose ; yet when it comes into the Veins, which are Canals always growing wider from a very small Beginning, its Accumulation cannot there happen, although the Velocity of the Blood is not so great there as in the Arteries ; its *Momentum*, or *Nisus ad Contactum* therefore with the Veins will be least, whereby what stuck to their

their Coats will slide along them without Interruption, tho' with a very slow Motion; that is, such a Motion as it is able to obtain from the Excess of that Velocity which is in the Veins, above the Quantity of that Resistance which the *Lentor* meets with against their Coats; and which Resistance is compounded of the Quantity of the *Lentor*, and the Magnitude of its Contacts; and increases according to its Quantity, and the Intention or Remission of its Viscidity. Therefore after it hath travelled this slow Pace through all the Veins, it will arrive with the Blood at the right Ventricle of the Heart, and by Agitation from the forceable Contraction of the Auricles and Ventricles thereof, it will become mixed with a more fluid Blood, and derived into the Lungs, through which it will easily pass, since Nature hath so contrived it, that the Chyle it self may flow through them, which is a Juice very thick and viscid. From hence it will come to the left Auricle and Ventricle of the Heart, wherein by their strong Contractions it will again be mixed with a more fluid Blood, or at least prevented from separating from it, whence it will receive a great *Impetus* in the larger Trunks of the Arteries, and like fine Sand floating in

in a rapid Current, by Means of its acquired Velocity, will it neither settle nor tend towards the Sides: But when it arrives again at those Capillaries where it was before obstructed, it will after the same Manner as before accumulate in them, and produce the Sense of Cold, with all other *Concomitants* mentioned in the preceding *Proposition*.

How it occasions Returns.

Yet after all these are over, the *Lentor*, in the Manner as before, is wholly washed out of the capillary Arteries into the Veins, to flow along their Sides as before with a slow Motion, and all its other Conditions of Course, until it is brought a third Time to accumulate in the Capillaries, and produce there over again the same Effects; then a fourth Time it is derived wholly into the Veins, where it performs its Circuit and Return with all the usual Affections, which also is in Order a fifth Time succeeded, a sixth, and so on in the same Manner and Condition, as long as there does not intervene any Power sufficient to destroy the Viscidity, or change it in Quantity, or Quality, or in both.

And determines the Periods.

But because, in Order to the Conveyance of this *Lentor* into the Capillaries, it is necessary that it should flow the whole Length of the Arteries, therefore in Proportion to its greater or lesser

leffer Retardation, its easier or more difficult Protrusion through their Extremities, and its greater or leffer Quantity, is there more or less Interval between each Return; so long therefore as some or all of these Conditions continue the same, without any Alteration also in the Nature of the *Lentor*, it cannot but pass through the whole Circuit of the Canals in the same Time, or which comes to the same, the Returns will be alike, that is to say, if the second Return is 24 Hours after the first, the third will be 24 Hours after the second, and so of all the subsequent Paroxysms.

But because this *Lentor* is greatly compressed in the capillary Arteries, whereby the Heat is disengaged therefrom; in that very *Nisus* therefore of Contraction, and the Seclusion of such a most subtle Matter as that of Fire, the *Lentor* will be more divided by the Agitation of that Matter, while it is in its Efforts for Liberty, and endeavouring to extricate it self on all Sides; its more viscid Particles will be separated, and those of greatest Resistance subdued, and in some Manner fermented; and the *Lentor* will become more fluid, and less in Quantity: The same to which will likewise continue, tho' in a much inferior Degree, while it is

How the Lentor may be changed.

flow-

flowing through the Veins, where the Heat striving on all Sides, and implicating its self amongst the Viscidities, with the more fluid Blood likewise acting upon it, and thrusting it towards the Heart, must its Disunion be facilitated. But this Effect will much more remarkably happen in the Lungs, because in them the contractile or compressive Force is in its greatest Energy, and they are on all Accounts suited for a Commixtion of the animal Fluids.

On the contrary, although by Means of an active Heat the Quantity of *Lentor* may be diminished, yet the Measure of its Viscidity may be increased, so that the Remainder becomes more tenacious; and this does chiefly happen when the Heat is great and sudden, so that it dries up the humid Parts only of the *Lentor*, and renders the Remainder more unfit for Motion, and by Means of its increased Tenacity, more apt to adhere to the Superficies of the Canals against which it circulates, and by Reason of its Diminution in Bulk, more fitted for Contact with them, and consequently more unfit for Motion. And lastly, the Quantity of *Lentor* will be increased, and the Blood, or any other Humour, will become more viscid, when any Thing is brought into the Course of Circulation that is more viscid

viscid, or apt to fall into that Disposition when it is got into the Vessels.

Let it then be supposed that this *Lentor* is encreased in Quantity, its Extrusion from the Capillaries will for that Reason be more difficult, and it will

*The Returns
sooner or later
from an in-
creased Quan-
tity.*

require thereto a more forceable Compression; and since such a Compression depends upon repeated Contractions of the Heart, there will be required more Time for its Extrusion, than when the Quantity of *Lentor* is less; and therefore a lesser Quantity will sooner pass thro' the Veins than a greater, and consequently will the *Lentor* sooner again on this Account return into the Capillaries; but because when this *Lentor* is thrust out of the Arteries into the Veins, it is divided every Way in the Cohæsion of its Particles, which separately float in the Current of different Magnitudes; and because there cannot be any Certainty in these Conditions, and that every one of them drives along the Superficies of the Vessel, against which they are protruded by the *Impetus* of the subsequent Blood, the greater therefore they are in Bulk, the more Surface the Blood will have to strike against, in Order to drive them towards the Heart; and the shorter they are in their transverse Diameters, the less *Momentum* will the Current have

upon them; whence on these Accounts it will come to pass, that the Velocity of the *Lentor* through the Veins may be greater, when it is increased in Quantity, than when it is diminished; if therefore the Stay or Retardation of the *Lentor* in an increased Quantity, in those capillary Arteries where it adheres, is as the Velocity of an augmented Quantity passing through the same Capillaries, so reciprocally the Retardation of this through the Veins, will be as its Velocity through the same; and consequently the Time of their whole Circuit equal, or the Paroxysms will return at the same Distances; but of the Retardation through the Arteries to the Velocities, is not reciprocally, as its Retardation to its Velocity in the Veins, the Times will not be equal; and the *Lentor* of an increased Quantity will return sooner or later than that of a diminished Quantity.

*The same in
a diminished
Quantity.*

After the same Manner we shall demonstrate, that the *Lentor* of a diminished Quantity may return sooner or later, or at the same Time as the *Lentor* of an augmented Quantity; for in like Manner as the *Lentor* on its Extrusion out of the Arteries is divided into Parcels of greater or lesser Magnitudes, will its Facility to Motion thro' the

the Veins be greater or lesser, whence, according to the same Reciprocation, or as the Proportions of the Velocities and Retardations are to one another, will the Times of the whole Circuit be the same or unequal, and consequently the Returns of the Paroxysms be syncronical, or sooner or later, in the *Lentor* of a diminished Quantity of Blood, as in that of an increased one.

From these Considerations it appears, that the *Lentor*, whose Tenacity is so reduced, that it comes nearest to the natural Fluxility of the Blood it self, will finish its Circuit the soonest; because this will more easily, that is, by fewer Contractions of the Heart, and in a lesser Space of Time, be forced out of the Arteries, and carried into the Veins; against whose Superficies it will hardly make any Stops; and therefore as its whole Circuit is compounded of the Times of its Progress through both these Canals, and those Times are both shorter than in a greater Degree of Viscidity, the Returns of the Paroxysms must be quicker.

And, on the contrary, it is manifest from the same Considerations, that when this *Lentor* is yet more tenacious, crass, and adhæfive, its Return will be more slow, even although it is not supposed so much in Quantity; because in

That Lentor which least deviates from a natural State of Blood returns first.

A more viscid Lentor, tho' not in so great a Quantity, will return more slow.

this lesser Quantity it may happen to spread it self like a most fine Webb, against the Superficies of the Veins, so that its Altitude, that is, the Quantity of Surface for the following Blood to strike against, so as to carry the *Lentor* on forward, will be least, and both its Dilatation in Respect to its Quantity, and its Force of Cohæsion greatest, for that by Supposition is augmented; the *Lentor* therefore that is supposed more tough, although it subsists in a lesser Quantity, will be slower in its Returns.

*The Times of
Return great-
er or lesser.*

But because the Time wherein this *Lentor* passes out of the capillary Arteries, through the Veins, Lungs, and Heart, to its Return into them again, is the Sum of its whole Circuit, and this necessarily depends upon its Velocity, chiefly through the Veins, which is in Proportion to its greater or lesser Cohæsion with their Superficies; the Times therefore between every Return will be shorter or longer, in Proportion to the greater or lesser Quantity of such Cohæsion, and its greater or lesser Resistance to that preterfluent Stream which endeavours to wash it away along with it.

In the first Place then it is to be observed, that the Length of the Canals through which this *Lentor* is to be carried,

ried, is not to be estimated from the simple Longitude of the most direct and short Distances between the Heart and extreme Parts, for this will take Place only in the Longitude of a greater Vein stretched out from the Heart to the Extremities, in the most direct and short Distance possible; but it is to be considered such as it really is, a thousand Times deflected and reflected, implicated, twisted, and branched into an innumerable Diversity of Turnings and Canals, in the same Manner as in Fact all the Blood-Vessels are distributed; and therefore as from such an Implication and Division, that Longitude, which otherwise would not be so extended, is stretched out into a vast Distance, that whole Length which the *Lentor* hath to conquer, in its Reaching to the Heart and Return into the Arteries, will not be very short.

Secondly, When it gets through the Arteries into the Veins, it comes into a very large Capacity, that yields to its Protrusion without any new Distraction; whence the *Lentor* is not agitated by a Power greater than that of its Cohæsion, and whereby it is thrown off from the Vessels when it comes into Contact with them, and made continually to change its Posture, as it happens in the Arteries; there-

fore the Force of the flowing Stream cannot easily carry along with it the *Lentor* when thrown into the Veins, unless the Resistances of its Cohæſion is overpowered by its proper *Impetus*, which will not be only difficult, by Reason of that retarded Velocity with which the Blood flows in the Veins, as before observed, but also on many other Accounts.

For because, in the third Place, the Parts of coherent Fluids, such as are all those which are viscid, do more easily slip over one another on all Sides, than they can be totally separated in those Surfaces whereby they cohere, therefore the preterfluent Stream striking against any larger Portion of *Lentor*, will so affect it in its constituent Parts, that those which are most remote from Contact with the Superficies of the Vessels, and nearest to the Axis of the Canal, will be struck over others, so as in a Manner to be turned round them; whence they will recede more towards the Superficies of the Vessel, and extend the whole viscid Mass into a longer and more depressed Form, until at length it is stretched into Contact and Cohæſion along the whole Surface of the Canal, before the other Parts of the same Viscidity, which were at first nearest to its Superficies, can be shook from

from their Contacts; and which they can by no Means lose, but by a Force superior to that whereby those Parts of the *Lentor*, most prominent towards the Axis of the Canal, are turned from their Directions, and which can hardly be supposed to subsist in a Velocity equal to that of Blood in the Veins, and more especially if the *Lentor* is very tenacious: And for this very Reason will it come about, that the *Lentor*, which otherwise, when disposed into thicker *Moleculæ*, would be easier to move forward, will, when spread out into a more depressed Form, and a greater Extension of Contact, become less fluxile; and when this Kind of Extension is of such a Nature, as may be conceived like a Web lining the inner Membranes of the Canals, the Force which the circulating Blood can impress upon it will be but very little, and the whole Power it has to Motion must necessarily depend only on a very small Faculty of Compression, whereby the Coats of the Veins can a little shift their Contacts with the adhering *Lentor*, and thrust it so far into the Current, that the Blood may have a small Force against it. Nor can the Progress of this *Lentor* be forwarded by any gravitating Faculty, or any other Power imaginable in it to draw it from

its Cohæſions; for the Force of Gravity in ſuch ſmall Portions of Matter, is always leſs than that of their Cohæſions, ſince even the larger Drops of Water, a Fluid not by much ſo viſcid as here ſuppoſed, do neither change their Figures, or fall off from the Branches of Trees, or any other Bodies on which they looſely hang; and the Power of Gravity hath yet leſs *Momentum* in Matter circumſtanc'd as in the Caſe before us; for when a Perſon is lying down, no Effect can be the Reſult of this Property, even in Fluids that have no Cohæſion with the Veſſels in which they circulate; and the ſame may be ſaid of any other diſtractile Faculty.

Fourthly, The Difficulty of Separation will be increaſed, becauſe by this rotary Motion the *Lentor* will be divided in its Superficies that are direct and parallel to the Veins, and ſpread into a thinner and broader Form; and the Labour of dividing it in thoſe Contacts, which are perpendicular to the Veſſels, and when it is in Adhæſion with them, may well be conceived from what hath been already ſaid: But if any one would more fully apprehend the Difficulty of breaking a *Lentor* thus circumſtanced, and ceaſe entirely to wonder at it, let him obſerve that any
viſcid

viscid Matter, collected in no great Quantity, and put under the Influence of its own Gravity against any Superficies that is even smooth, such as Glafs, &c. will hardly change its Posture for many Days together; and sometimes not at all, if in Suspension it grows more viscid and less in Quantity; nay, let him remember that even the clearest Water will hang in very narrow Tubes, so as not to be easily shaken from thence either one Way or other, but by a very considerable Force; and in the last Place let it be taken Notice, that there are naturally in Being some Humours, whereof one or two Ounces will not pass much shorter Canals under the Space of eight or more Hours, as *De Graef* hath himself observed of the *Pancreatick* Juice, one Ounce only of which he was able to collect in that Time, and of *Bile* two Ounces in the same Space; from all which we judge it safe to conclude, that as the Force of Adhæſion to the Canals is greater or lesser, with Regard to a more or less viscid *Lentor*, the Times of its Returns will be one, two, three, or more Days.

Because then the whole *Lentor* is at last washed out of the capillary Arteries, they will therefore be reduced to their natural Capacities, and the Blood will
Between the Paroxysms the Patient to Appearance is well.
flow

flow through them in its natural Quantity, without any Cause that shall more than naturally compress, comminute, and diffuse its Heat; that is, in its whole Circuit through them the Blood's Heat will be at its natural Standard. But because the loosened Heat easily perspires, its Quantity will on this Account diminish, and as it flows in the Veins, Part will waist this Way, and Part be entangled in the common Mass, as before observed; for that Diminution of Velocity the Blood flows with in the Veins, hinders its further Communion, and facilitates such a Union; nay, the Heat is easily hereby admitted into the grosser Combinations, wherein its Activity is greatly restrained, and its Perception on that Account much diminished. Moreover, since a considerable Space of Time passes between each Paroxysm, the whole Mass during that Space flows many Times through the Lungs, and is therefore more blended and incorporated again with its igneous Particles; on these Accounts the Blood will become of a more natural Disposition, from whence all Things will result as in a natural State, and the whole Body be, or seem to be, as in a Time of perfect Health; although it will not in Reality be so, because the peccant Humour yet remains in the Veins, and
what

what is able again to disorder the Constitution, will soon return into the Arteries, and excite a Perception of Cold, with all its *Concomitant* Affections, so that the Disease and its Cause is yet in Being in the Veins.

But although this may often happen, *But not always necessarily so.* by Means of the great Distance between the Returns, yet it does not always necessarily prove so; for if the Heat meets with greater Obstruction in Transpiration, either from too viscid a State of Blood, or from too great a Straitness of the Pores, or from the Heat's Incorporation with Particles too fixed, and unfit for perspiring, or from any other Cause of the like Nature, or if the Blood is so fused and dissolved by the Heat succeeding a cold Fit, that by the subsequent Mass it cannot be restrained, nor naturally blended as it passes through the Lungs, the Heat will then freely exert its Activity, and the Body will remain in a Temperature hotter than natural, until the *Lentor* is re-accumulated in the capillary Arteries, so as to renew the cold Fit.

For Brevity Sake then and Perspicuity, *A Multiplicity of Returns, and in the same Order.* let this *Lentor* be supposed of such a Nature, that it returns every third Day, it is manifest that it was removed on the second Day, but lay concealed, and slid along the Superficies of the Veins, with-

without being able to give any Perceptions of its Existence; on the second Day therefore the Blood is so vitiated, that it can supply again the same *Lentor*, that is, one of such a Nature as shall appear again on the third Day; and this new *Lentor* shall again on the second Day from the Attack of the former, be derived into the capillary Arteries, and occasion a Cold equal to, or greater, or lesser than the foregoing, as this second Supply shall be circumstanced like unto, or different from that; and if this again makes its Way into the Veins, just as the preceding is entering the Capillaries, there will be a cold Fit produced again the third Day, with all the *Concomitants* of that in the first Day; and if again another Supply of *Lentor* accumulates a fourth Day in the capillary Arteries, there will be produced the same Effects as from that returning the second Day.

And even between all these Reduplications, the Body shall seem well.

And this alone may suffice to shew, after what Manner the Reduplications of the Fits may be circumstanced, of what Kind soever they be, whether returning every Day, every third, every fourth, or seldomer, and from hence it is also possible, that a cold Fit may return oftener than once in a Day, in such Manner, that every Paroxysm may answer to the same Paroxysm, which
re-

returned the preceding Day at the same Time. But although in all these Reduplications, of what Kind soever, whether of those recurring every Day, every other, or every fourth, or seldomer, by Reason of the Shortness of Time between every two succeeding Paroxysms, the Blood can but very little recover its natural State; yet in Proportion to its Deviations into Distemperature, and its Re-comminution and Digestion, may it for a very short Time be restored, insomuch as to give the Appearances of perfect Health; but this does not necessarily happen, nor easily.

From the foregoing it appears, that the Times or Intervals between every two Paroxysms is in Proportion to the Degrees of Tenacity in the peccant Humour, and this Tenacity is determined by the Quantity of aqueous Humidity mixed therewith; when therefore it happens that more or less of this Humidity is wasted or absorbed from the *Lentor* in any one given Circuit, its Return will be proportionably sooner or later, according to such a Consumption, and as the Remainder is thereby rendred more or less fluxile, or susceptible of Motion; whence if the supposed Return should be every Day, it will afterwards grow seldomer, for Instance, every other Day, or every third

*Reasons for
Diversity in
Returns.*

third Day, as the *Lentor* is become more dry and less fluxile; but if there be mixed therewith, or is generated any Humidity further to dilute the *Lentor*, and reduce it to the Fluxility of natural Blood, its Return will be either altogether cut off, or it will become more frequent. Since therefore in the Circuits of these *Lentors* to the Capillaries, while they are protruded towards the Veins, and the Heat yet remains in Vigour; and again protruded into the capillary Arteries, where the hotter Parts are wasted, the most fluid Part of the *Lentor* may be attenuated and evaporated, and more especially when the Heat is most intense; so that it dries away all the Moisture, and makes the Remainder of the Viscidity in the Veins more tough, and less moveable, which therefore shall not finish its Circuit, and return in less than every third or fourth Day. Again, on the other Hand, because the *Lentor* obstructs in the Capillaries, and the Heat continually strives to disengage it self therefrom, some Parts of this *Lentor* may be subdued and fermented; that is, reduced into a more liquid State, to which it will yet further approach, when it is conveyed through the Lungs, and acted upon in Respiration; as therefore the *Lentor* shall from these Causes be circum-

stanced,

stanced, and rendered more fit for Reduction, Fermentation, and Solution, or for the Separation of its more fluid Parts from those which are more tenacious by the Contractions of the Vessels, through which it is carried, the Returns will be determined, and changed from *Quotidians* into *Tertians* or *Quartans*, or from *Quartans* into *Tertians* or *Quotidians*, or Reduplications of either.

Let there be then supposed such a Quantity of *Lentor* residing in the Blood, that it cannot be discharged through the capillary Arteries into the Veins, although it be in a small Quantity, yet of so strong a Cohæsion, that it cannot be separated from the Coats of the Vessels; the Mass therefore cannot finish its Circulation, whence in a small Time the whole Body must grow cold, the Blood will not pass into the Muscles, nor will it arrive at the Brain, or else there stagnate, whence there will be no Secretion of Spirits to flow into the Nerves, and consequently a Privation of Sense; and when the *Lentor* and its Obstruction is supposed so obstinate, that it cannot possibly be got forward in the Arteries, the Motion of the whole Mass of Blood must irreparably cease, that is, (which is the same Thing) there Death will ensue. And as all this happens when the *Lentor* is in the Arteries,

*From the same
Lentor may
happen Death
chiefly in the
cold Fit.*

ries, that is, in its Return, Death will more generally happen in the cold Fit: But if the *Lentor* is passable through the Arteries, and the Body is afterwards parched with a great Heat, which exhausts the Blood of all its Spirits, and exhales it; or where the Heat is not so intense, and proves more moderate, yet if it finds a Blood defrauded of Spirits, by preceding Paroxysms, or a Blood that has a few Spirits, but such as are exhalable by a small Heat, Death will happen not at the Attack of the cold Fit, but sooner or later after it; and it will the sooner happen in a Scarcity of Spirits, because they will not only dissipate by a small Heat, but also naturally spend themselves in the Motions both of the Body and the Mind. Death therefore will for the most Part, and most easily, happen in the Re-accumulation of the *Lentor* upon the Capillaries, that is, in the cold Fit, but this not always necessarily.

The Lentor attended with Heat, not wholly carried out of the Capillaries.

In the second Place be it supposed that a *Lentor* returns attended with Heat; this then as the other stops in the Capillaries, but yet in such Manner, that the natural *Impetus* of the Blood, and its Pressure against the Arteries remaining, the Heat will get disengaged, and the Arteries never be quite obstructed; and this Heat will continually be breaking

ing loose from the stagnating *Lentor*, and passing into the Veins: From the succeeding Blood therefore it comes about, that as it finds a Passage in some Measure open, the *Lentor* which at first stopped will be less compressed, whence necessarily, in the first Place, that which is most moveable and expressible, as the Heat is, will be first carried into the Veins; Secondly, since that which already stops is less crowded by the following, part of this will find an open Passage through, and by Means of such a lesser Compressure will the adhering *Lentor* continue in its Contact with the Vessels; yet that which is not quite hardened by a Consumption of its Humidity, and rendered altogether unfit for Motion, will even by such a lessened Compressure be separated from the dryer Parts, and carried into the Veins; and somewhat like to this will happen in every Kind of *Lentor*; which, in Proportion to its greater or lesser Facility to Motion, will recur every Day, every other, or every third Day, and sooner or later finish its Progress through the Vessels. This Separation of a lesser Viscidity from that which is more obstinate, is the necessary Result of a diminished Compressure, as it manifestly appears from the absolute Conditions in Separation of any Viscidities from Particles with which they

P

are

are mixed; and this Separation is circumstanced, as the recurring *Lentors* with Heat are diversified in their Consistances to the whole. For that is most unfit for Motion, and most dry, which remains sticking to the Arteries, after its more fluxile Parts have escaped from it; and because a diminished Compression, or Protrusion, occasions the Arteries to be less distracted outwards, as soon as the Heat and more fluid Parts are got into the Veins, their Restitutions and Contractions inwards will be very weak, and consequently not able to shift their Contacts with the remaining *Lentor* that is so difficult to move, whereby it will continue in Cohæſion with them, and grow yet more fastened thereto, by the continual Waſt of the thinner Parts, until it is impossible to move it by the whole Force of the circulating Current.

*Its Returns
the same as
the Lentor
with Cold.*

But because from the adhering *Lentor* there is separated a Viscidity, yet somewhat more moveable than that which is most dry, in Proportion to its Degrees of Fluxility will its Returns into the same Capillaries be every Day, every other, or every third Day, as was before explained of the *Lentors* returning with Cold; for this flows thro' the same Vessels, and slides with a very slow Pace along the Coats of the Veins,

Veins, with all the other particular Circumstances as there singly enumerated: And on every Return it cannot but aggravate the Heat, when it arrives to the narrowest Part of the Arteries, where, by Means of that dry *Lentor* which lines the inner Superficies all round, it cannot but be more crowded, and have more Heat compressed out of it, as above explained already.

But since this dryer Part of the *Lentor* continues in Contact with the capillary Arteries, the subsequent Blood must always be kindled into a greater Heat than natural, by the greater Compressure and Straitness of the Passages, whence it will rarifie and inflame so much, as never to leave the Body quite free: Add to this, the Consideration of its Dryness, Adhæsiion, and Inaptitude to Motion with the common Stream; also the Want of it there to incorporate with, and restrain the Activity of, the hot Particles of the Blood, whereby their Motions are more inordinate in themselves, insomuch that they cannot be blended with others by Respiration as they pass through the Lungs, and especially for Want of those gross, dry Corpuscles, which are most fitted to entangle them in their Pores, and restrain their Activities.

*Why between
the Returns
the Body not
left well.*

Hence Death
chiefly in the
Return,

but not always
necessarily.

From this Heat it may come about, that all the remaining Humidity in the Blood may be attenuated and exhaled, and the whole Mass become more rarified, hot, moveable, readier for Perspiration, and more unfit for the Generation of new Spirits; whence in the Returns it is yet more comminuted by the dry *Lentor* which adheres, whereby at last it becomes so subtle and active, that it exhales by Transpiration all the remaining Spirits from the Blood, whereupon very easily, and most commonly, ensues Death; but this does not always happen at this Time necessarily, because the like Exhalation and Consumption of all the Spirits may happen after the Return; when, through Intenfeness of Heat, the whole Mass is thrown into a Fervor, so that the Spirits partly evaporate, and are partly spent by muscular Motion, and the Passions of the Mind; and this the sooner is effected, if the Blood is much diminished in Quantity, or has before been defrauded of its Spirits, as hath been already explained when Death happens upon a *Lentor* attended with Cold.

Multiplicity and Change of Returns. When therefore the Returns of this *Lentor* with Heat happen in the same

Order as the Returns of a *Lentor* with Cold, it is manifest that with *this* there may be the same Multiplicity of Returns

turns succeeding one another in the same Order as with *that*, according to the preceding Account; and also that they may be alternately interchanged in such Manner, as after a Fit every Day returning, others may succeed every second, third, &c. as above enumerated.

Let the Blood therefore be now supposed in such Circumstances, that the *Lentor* which seizes with Cold be so far broke, that by the natural *Impetus* of the circulating Blood its Heat may be disengaged from it; such a *Lentor* therefore will be divided into Particles very moveable, such as those of Heat are; and into others less susceptible of Motion, which therefore will greatly accumulate in the Capillaries with Dispositions not to excite a Sense of Cold, but of Heat; and such a Kind of Solution as this will not be difficult to obtain either by Means of a Fermentation, or a greater compressive Force, in such a Degree as may be sufficient to extricate the Heat, and what is of a more fluid Nature, and yet leave the more viscid and dry behind, in close Contact with the Vessels. But during this Mutation, the Body will not be left entirely free as in perfect Health, nor will the natural Functions be duly performed, whence the Blood will grow more fused, and the Spirits will evapo-

The Change of a Lentor with Cold, into one with Heat, and è contrà.

rate beyond Reparation, by which Means such a Change is the most threatening of Death. But, on the other Hand, in a Viscidity producing Heat, if its most tenacious Parts adhering to the Arteries be fused by Fermentation, and so loosened that it can be separated from them, and again mixed with the Blood, so as to occasion a new *Lentor*, which shall bring on a cold Fit; the Body will be left entirely free for some Space of Time between the Returns, the Spirits will be recruited, and Health will ensue, or a perfectly natural State.

A Return of Lastly, Because in a *Lentor* producing
Lentor with Heat, there always adheres somewhat
Cold, between to the Arteries, which is its dryest Part;
every Return and therefore a *Lentor* producing Cold
of Lentor will either flow through, or stop in the
with Heat, &c. Cavity that leaves, so that if the Blood is so vitiated, while this dryest Part adheres to the Capillaries, that it generates a Viscidity which entangles the Heat, then must ensue a cold Fit, until such a cold viscid can be got through into the Veins; and to force this through into the Veins, a Quantity of Contraction will be sufficient, which is not so for forcing away the most dry Part of a *Lentor* producing Heat, because that adheres more closely; nor will such an adhering *Lentor* be more thinner,
 or

or at all torn away by the cold Viscidity crowding through its Cavity, by any other Cause than this same Pressure, which being less than the Resistances from its Cohæſion, will yet leave it in Contact with the Vessels, after the viscid *Lentor* producing Cold is got thro' into the Veins, and consequently will there be a Return of Cold between every Return of a hot Fit; and on the contrary.

But it is not only thus very probable, *Repetitions of the Cold.* that between every Course of Heat there may be also a certain Return of Cold, but also that this Cold may return more than once in such an Interval; for when the *Lentors* producing Heat are once mixed with the Blood, and their most active Parts quite disengaged from the Entanglement of other less moveable, it may easily happen that many of these latter may so accumulate in the Capillaries, as to exclude or suppress the Perception of Heat there, which Sense of Cold will again restrain the Blood's Current into the Veins, and its Return to the Arteries, whence will proceed a Diminution of Spirits, or a Suppression of them, or a weakned Contraction of the Heart, and consequently an universal Perception of Cold all over the Body: whence appears the whole Proposition.

PROPOSITION XX.

This Lentor which produces Cold may be generated in the Blood, without the Introduction of any Foreign Particles into it; and this generating Principle must be somewhat either very viscid, or very liquid, but fitted to cause a Lentor, and that without any Foreign Influx into the Blood, either by a Diminution of its Motion, or Quantity; and from a Repetition of either of these Causes it comes about, that after a Lentor is generated, which recurs in a certain given Time, another also may be produced recurring at certain Periods between every Attack of the former; and on an Increase also of the Blood's Motion, or Quantity, may the same Cold be generated. But for the most Part, and with least Difficulty, will this Lentor producing Cold, and frequently recurring at certain Periods, either in one or another Part of the Body, and as soon again disappearing, happen upon the Omission of usual Exercises, or Labours; upon a Suppression of the grosser Perspirations, if there are any such from the Blood; a Suppression of Evacuation of that which is viscid in it self, or able to turn the Humours into Viscidity,
whe-

whether natural, or contracted by Custom; upon a prohibited Separation of viscid Humours from the Blood, or if they are separated, a Prevention of their Secretion into their proper Canals; and other Causes of the same Kind. By an Influx of Saliva, or Viscidity through the OEsophagus and Stomach, or of the Mucus of the Intestines, or of the Pancreatick Juice or Bile, since all these may be mixed with the Blood, or of Chyle or Lymph, because every one of these singly or jointly may become more viscid, or if they are never so fluid, but disposed so to coagulate the Blood, that its Heat may be entangled in its Lentors, or of any other Humour, stagnating by Obstruction or Compression in any Viscus, and derivable into the Blood's Current after any Space of Time. But whether this Lentor generating such a Series of Affections, that recur in the same Order as already explained, be occasioned with or without any Influx of Foreign Matter, there will from it arise these two material Distinctions, the first is, where the original Lentor is not wholly spent in the first single Circuit, but recurs oftener, as already explained; and the other where it is quite wasted, but the Cause producing it yet so subsists, as to generate a fresh Quantity after a certain Space of Time; and whether this Cause producing a new Lentor does it
by

by acting immediately upon the Blood it self, or by supplying it with viscid Particles from without, those Conditions of its Motions cannot be destroyed, which we have demonstrated necessary to the Repetition of its periodical Returns. Lastly, Although there are certainly such Particles as will communicate a Sense of Cold by their Motion, and that of this Kind may be imagined that Ferment mixed with the Blood, which produces the cold Fits at the abovementioned Periods; yet this Ferment cannot act so as to excite a Sense of Cold, but by restraining the Heat's Activity, and running the Blood into a Lensor; whence from whatsoever Cause that Series of Affections already enumerated does arise, and its Forerunner the cold Fit, there can none happen without an Accumulation of Lensor in the Capillaries, unless such a Ferment restraining the Heat's Activity can be assigned, which does not at the same Time produce a Lensor in the Blood, but either keeps it in its natural State of Fluxility, or by some Means or other so comminutes it, as to render it thinner; and where such a Ferment does subsist, there will recur the same Series of Affections as before recited, without the Accumulation of a Lensor in the Capillaries. In like Manner a Lensor may be found in the Blood which in its Exertion is accompanied

panied with Heat, without the Influx of any Foreign Matter into it; and this may be either in such a Degree viscid, as will suffer the Heat to be set loose from it, or indeed very liquid, but so disposed to fuse the Blood, that its Heat may exhale from it, and its other Parts rendered thereby less fit for Motion; and this from an increased Motion, or an increased Quantity of Blood; and by both these it may happen, that after a Lensor is produced which recurs at certain Periods, another may be generated that shall recur in the Intervals of the former; and moreover may there be given a Heat frequently and suddenly recurring with Intervals of Cold, from an Increase of Exercise, or bodily Labour, beyond what is customary, from a suppressed Perspiration of those hot Particles, which should exhale from the Blood, a Detention of hot Excrements, and such as heat the Blood, either naturally or beyond a natural State; a Detention of hot Humours in Combination with those constituting the Blood, or if they are disengaged from such Union, a Stoppage to their Derivation into suitable Canals, and all other Causes of like Nature: But by an Influx as at first supposed, the Reverse, of what was said concerning the Production of Cold, will happen, and concur in the Generation of Heat.

Be-

A Lensor
with Cold
from a dimi-
nished Moti-
on of the Blood.

Because by Heat the Blood is, so far at least, fused, that the Parts between which the Heat acts and moves cannot cohere together, the Heat of the Blood will be increased by its Motion; from a Diminution of Motion therefore in the Blood, its Measure of Heat will decrease, and consequently that Power by which the Blood's constituent Particles are kept from Cohæsion; wherefore a *Lensor* under this Circumstance will be more easily generated, and that of such a Nature, as will entangle the Heat; that is, a Sense of Cold will be produced, since the *Momentum* of the Blood's Motion is supposed less than natural; and therefore by a Diminution of Motion in the Blood, will there be generated in the Vessels a *Lensor* producing the Sense of Cold.

The same from
its Diminuti-
on in Quanti-
ty.

But because in Proportion to a Diminution of the Blood in Quantity, there will be the less Heat at Liberty, or to be set at Liberty, when therefore the Blood is lessened in its natural Quantity, its Heat will be lessened, and a *Lensor* will be generated with a Sense of Cold, the Generation of which will be rendered the more easie, if its diminished Quantity is propelled by the Heart with a weakned *Impetus*; and this for the most Part happens in a lessened Quantity of

of Blood; for in this Circumstance the Blood will be less comminuted, and will not be thrown to such great Distances, by that Force which it obtains wholly from the Heart; and moreover as the Blood is supposed under a Diminution of its Quantity, the Arteries will be less thrust outwards, the Brain will be less compressed, a less Quantity of Spirits will be derived into the constituent Fibres of the Heart, whence they will contract more weakly, and the Blood will be propelled with less *Impetus*; and lastly, this very *Momentum* of Contraction in the Heart will yet be rendred more weak, because, by Means of a diminished Quantity of Blood, there will be less of a nervous Fluid secerned, and a lesser Quantity of it derived into the Cells of the contractile Fibres.

From both these Causes therefore may *After one, another may be* a *Lentor* be generated, which will be *produced, recurring in the* accompanied with a Sense of Cold: *Intervals of the former, and both from the same Causes.* If the Blood, for Instance, be drawn away by Phlebotomy in a large Quantity, so as to sink the Spirits, by an Hemorrhage from the Nose, hemorrhoidal Veins, Womb, or the like; or by large Purgation, Salivation, Emission of Seed, Consumption of Spirits, a violent Compression of the Brain, from what Cause soever, or by any other Means di-

diminishing the Blood in Motion or Quantity, a *Lentor* will be generated producing a Sense of Cold; which Cold will not however be perceived, until the *Lentor*, after the Manner above explained, comes to accumulate in the capillary Arteries: But because that other *Lentor*, before generated, hath in this Interval passed out of the same Arteries, and is now for some Space of Time making its Progress through the Veins, therefore this new generated *Lentor* will not flow along in Company with that, but follow it, and consequently will *that* first finish its Circuit, that is, will return back again into the Capillaries before *this* can again arrive at them, whereby there will arise alternate Returns of both *Lentors*: The whole of which makes it manifest, that of two *Lentors* recurring at different Times, their Circuits may be kept distinct, and their Returns attended with all the enumerated Circumstances.

The same Let it on the other Hand be sup-
Lentor also posed, that the Blood exceeds its natu-
from an aug- ral Quantity, the Arteries will be then
mented Quan- crowded, whence the Blood will flow
tity of Blood, with more Difficulty, and be more
but its Alter- compressed; whensoever therefore such
nations of Compression is in any Part of the Bo-
Heat and Cold dy so great in any given Space of Time,
more sudden, that during that Space the Heat can-
and frequent. not

not get disengaged in that particular Part, then there will be perceived a Sense of Cold, and that suddenly; but because such Pressure increases and spreads, the Heat will at length get at Liberty, either by Reason of an invigorated Compressure it self, or by Means of its Duration, wherein the Blood undergoes a longer Attrition, and consequently disengages the Heat from it. The same to this also happens upon an increased Motion; for as the natural Velocity of the Blood is accommodated to its natural Quantity, whereby within a given Space of Time it can finish its destined Circuit through its Vessels, when therefore its Motion, that is, its Velocity is increased, it will happen that within that natural Time a greater Quantity of Blood than is natural will enter into those Vessels, whence it will be retarded; and as in its Stay the Heat will be restrained in the Part loaded with it, so there will in that Part arise a Perception of Cold; because further in this interim, those narrow Canals are passable at least to some Parts of the Blood, while other Parts in some Measure stagnate, that which passes will be the less compressed, and will the less entangle its igneous Particles, whence they will soon make their
Escape,

Escape, and diffuse all round a Perception of Heat.

*From Inter-
mission of
Exercise.*

Because by Agitation of the Body all its Viscidities are comminuted, broke smaller, and changed into perspirable Particles, where therefore a Person has been accustomed to such Exercises, as after this Manner perspires the grosser Humours out of the Habit, upon their Intermission, or total Omission more especially, all gross Humours and Viscidity will accumulate in these Vessels, from whence otherwise it would make its Escape, if by Action it was shook away; by the Mixture therefore of such Viscidity the Blood will become thicker, and generate a *Lentor* producing Cold, if such *Lentor* can entangle and restrain the igneous Particles.

*Suppressed
Perspiration,
&c.*

The same to this will also manifestly happen from a suppressed Perspiration of the viscid Parts of the Blood, if any such naturally perspire from it as can restrain its Heat from Exertion; the like from suppressed Purgation of the Blood-Vessels, as of the *Menses*, Hemorrhoids, &c. as such are viscid, or able to render the Blood so by a Suffocation of its Heat, and this whether they are natural Discharges, or acquired by Distemperature and Custom.

Suppose again some viscid Humours, the Bile for Instance, to be by some Cause

Cause or other rendred incapable of Solution and Separation from the Blood in the Hepatick Vessels, and that this will obstruct the Diffusion of its Heat; the Blood therefore when in Union with such an Humour must be thicker, its igneous Particles will be entangled, and a *Lentor* will be produced causing Cold: Nay, let it again be supposed, that this is capable of Separation from the Blood, but that it cannot be secerned into its proper Canals by Reason of Obstruction, Compression, or the like; it will then be carried away by the Blood's Current, and apt to render it thicker and colder; when therefore it is thus separable in the Liver, but for Want of Secretion carried with the circulating Blood into the Habit, it will cause a *Lentor* and Sense of Cold.

From all these Considerations it therefore appears, that a *Lentor* producing a Sense of Cold may be generated in the Blood, without the Introduction of any Foreign Matter into it; but further may a *Lentor* be generated which will produce a Sense of Cold, from an Influx of Matter into the Blood from without, that is, when such Matter is viscid and suited to entangle the igneous Particles, or even if it be in it self very fluid, but disposed to generate a viscid Blood: And this Derivation cannot be

Q made

A Lentor producing Cold in the Blood, without the Influx of any Foreign Matter.

made but from Canals emptying themselves into the Blood-Vessels, and there are no other of this Kind but the Thoracick Duct and Lymphaticks; and these only therefore can convey any such Viscidity into the Blood, or any Matter disposed to run it into Viscidity, that is in it self very fluid. Through these Canals is derived a Lymph, and the Chyle with such Principles as enter into its Composition, and which have already been hypothetically enumerated; if therefore by Means of any unnatural Affection of the Blood, or of the nervous Juice, from whence the Lymph is derivable, or by Means of some Affections in the Instruments, which separate the Lymph from the Blood and nervous Juice, that Humour becomes viscid, or fluxile with a Disposition to change the Blood into Viscidity, and depress its Heat, or to render the Chyle with which it mixes of a more viscid Nature; upon its Derivation into the Blood again there will be a *Lentor* occasioned in it, which will produce Cold. Suppose then any *Viscus* compressed, obstructed, &c. so that its proper Juice is secerned more viscid than natural, and which cannot by Reason of its Viscidity be conveyed into the Current of the Blood in the Trunk of the *Vena Cava*, but in a certain Space of Time, and

and when there, be suited to depress the Activity of the natural Heat, there then will be a *Lentor* generated in the Blood producing a Sense of Cold; and even if this Humour, in a distempered State, should be most fluid, yet apt to coagulate the Blood, it will have the same Consequences: And therefore from all this is it manifest, by what Means this *Lentor* may, and will, be generated in the Blood, and how it will produce a Sense of Cold.

Whether this *Lentor* is generated with, or without the Influx of any Foreign Matter into the Blood, the Cold cannot return periodically with all the enumerated Affections in their Order, unless the same *Lentor* recurs after a certain Space of Time; and therefore is it an Argument, that it hath either been not totally subdued, or totally so, and discharged out of the Body by some excretory Outlett, or reduced again into the perfect Nature of Blood; but the Cause which produces the first *Lentor* will produce another in the same Space of Time, recurring with the same Affections, to be after the same Manner subdued, and reduced into the Nature of Blood within the same Compass of Time, whence there will be a double Source of the Returns

A twofold
Reason for Re-
turns.

of Cold, as is manifest from the Premises.

A Way to account for the Returns, without that great Retardation before-mentioned.

I do now come to shew how these Returns may happen, without that great Retardation in the Motion of the *Lentor* within the Veins, as was supposed in the preceding Proposition; but that such Retardation cannot be avoided upon a Return of the same *Lentor* is manifest from that Proposition. In the second Place therefore let any two Returns be supposed, (that is, for Instance, recurring at the same Hour every Day; for the same Reason will hold for all others recurring at longer Intervals of Time) and the first of these produced from a *Lentor*, which shall be totally subdued, by Expurgation, or Change into Blood, in the Space of one Day, that is, within the Space of one whole Circuit; but the second from a *Lentor*, that shall be just the same in Quantity and Quality, as that which produced the first: I say, first of all, that either of these *Lentors*, and any other returning in the same Hours, and finishing its Circuit in one Day, may successively, and by Degrees, be accumulated in the Blood-Vessels, so that gradually, and in very minute Particles, it may either flow into, or be generated in them, until it excites a Sense of Cold, and all its *Concomitant* and *Subsequent* Affections. For because
to

to the Excitation of Cold with all its Attendants, it is necessary that the *Lentor* should stop in the Capillaries, and not in one or another only, but in many together, it is also necessary that the Quantity of this *Lentor* should be considerable, and so far considerable as to be able to restrain the Heat and natural *Impetus* of Circulation, and likewise obstruct in the Arteries, which it cannot do unless its Quantity be so great that it cannot be incorporated with the Blood, and freely circulated through the Arteries. This considerable Quantity of *Lentor* therefore is either wholly generated in the Blood-Vessels, which appears to be possible, or is wholly derived into the Blood from without, which also is practicable; nay, it is demonstrable that this very Quantity is gradually insinuated into the Blood-Vessels, or therein gradually generated, and therefore is it possible that somewhat is a whole Day accumulating either in it self viscid, or generating Viscidity, but in so small a Quantity that it requires the Compass of a whole Day to become considerable enough to excite Cold with all its Attendants. Suppose then the Seizure of a cold Fit be at the Close of the Day, for Instance, and that there is a new Return of the same *Lentor*, accumulated in the Space

of another whole Day; if this *Lentor* can be subdued totally within the Space of the following Day, and in the mean time another *Lentor* be accumulated in the Blood in equal Quantity, there will be again a third Return, and so on in Order, not by the same *Lentor* recurring into the Capillaries by a very slow Motion, but from a new *Lentor* succeeding another wholly subdued: And this Subduction is effected sooner or later, according as the different Natures of the *Lentors* will admit of their Solution by Heat in the Augmentation and Height of the Paroxysm, or of those Bodies which are incorporated therewith. Because therefore this *Lentor* is supposed to be successively and gradually accumulated, so that a whole Day passes before it is arrived to its full certain Quantity, every single Particle added to the Blood in every Point of Time, may be carried on with the usual Celerity of Circulation, and consequently will there not be any of that Retardation of *Lentor* in the Veins, as above recited in the foregoing Proposition.

This Lentor may be carried many Times through the Lungs without Alteration.

But because the full Quantity of *Lentor* sufficient to bring on a Fit is supposed to be accumulating for a whole Day, therefore within the same Space of that whole Day will this *Lentor* pass many thousand Times through the Lungs, with

with the other *Viscera* and Parts of the whole Body; which perhaps may be thought more strange than that great Retardation mentioned in the preceding *Proposition*, but yet several indisputable Facts do entirely remove this Difficulty; for who is it that knows not how long the Milk of those who give Suck, and the Urine of many Persons will retain a particular Smell, much beyond the Space of one Day; and the Flavours of *Asparagus*, *Smallage*, *Garlick*, *Cassia*, *Rhubarb*, alexipharmick Oils, Oil of *Turpentine*, and the like, are irrefragable Proofs, that somewhat from such Substances does pass the manillary and renal Glands without Alteration; and very often too must it pass through the Lungs, wherefore in like Manner may this *Lentor* take its Course in Circulation through them, many thousand Times, without undergoing any Change. What is more notoriously known than the Poison of a mad Dog to continue in the Body 30 or 40 Days before it discovers it self, and sometimes longer? This is without Doubt all the while mixed with the Blood, and how many thousand Times must it then circulate through the Lungs within the Space of forty Days, or so long as it lies without Exertion, and yet not be changed? Somewhat like this therefore happens in the

assigned *Lentor* of a Fever, as may beyond Contradiction be made appear.

Thirdly, By a continual Accumulation of a *Lentor* of this Nature within the Blood-Vessels, immediately after an Attack of the Fit, there may be occasioned fresh Attacks and Circuits that are *simple*, but not *compounded*. The first Part appears from what hath been already said, but in Order to understand the second, it is necessary to know, that from whatsoever Cause so much *Lentor* is accumulated in the Blood, 12 Hours for Instance after a Return, as is sufficient to excite a Perception of Cold, with its usual Attendants, it must be either a new Viscidity from some Part of the Body, and in Plenty, or some Liquid suited to coagulate the Blood into such a *Lentor*; when therefore this *Lentor* flows through the Arteries, it is mixed with that other *Lentor* which otherwise would not have brought on a new Paroxysm under 24 Hours; wherefore from both is compounded a fresh *Lentor*, which jointly will bring on a Perception of Cold within 12 Hours, and will be wholly wasted. During therefore this Concourse, after the new Attack of that *Lentor*, which otherwise would bring on a Paroxysm but once in 24 Hours, unless some Part of it be wasted in the Compass of the remaining

Simple but
not com-
pounded Fits
from such a
Lentor.

ing 12 Hours, there will be accumulated but half of that *Lentor* as is required to bring on a Fit every Day, and therefore 12 Hours more are to be expected for finishing such an Accumulation as is necessary for an every Days Fit; whence the third generated *Lentor* is distant from the second 36, and the second from the first 24 Hours, whereas in compounded Paroxysms, every two Fits alternately correspond to one another. But if after those 12 Hours that *Lentor* again recurs which was supposed to recur the first 12 Hours, and half of that should also be expended in a Fit, there would then be produced a new Order of Returns and Circuits recurring every half Day; and those will be more aggravated, in Consideration they are raised by a *Lentor* exciting a Fit once a Day, and one exciting a Fit every half Day together.

From hence it appears, in the fourth Place, that all Returns are regular, disturbed, or in no Order at all, answerable to the Accumulation of *Lentor* in the Veins, or a coagulating Liquid, as that is collected equably or uncertainly in its Quantity or Quality. For after a *Quotidian*, for Instance, let a Quantity of *Lentor* be supposed to accumulate sufficient to excite a Fit in 12 Hours, there will then therefore be given a new

The Returns
uncertain or
regular.

new Return of half a Days Period, immediately after the Attack of this, or some Hours after the Accumulation of that *Lentor* is supposed to begin, which being heightened to a certain Quantity, may produce a daily Return and Circuit; and this fit Quantity of *Lentor* will be accumulated within that Compass of Time, which is computed from the Beginning of its Accumulation, to 12 Hours after the Attack of a half Days Fit; a Return therefore will be produced answering to the preceding *Quotidian*; after the Termination of which, if so much *Lentor* be generated within the following 12 Hours, as hath been accumulated for the Attack of a Fit between every *Quotidian*, (whether such Accumulation be made equably through that Space of 12 Hours, by Degrees and slowly, or altogether at once, or in a lesser Number of Hours, and a shorter Space of Time only) 12 Hours after the Attack of the *Quotidian*, will another Attack be in Readiness answering to that which came on 12 Hours before that *Quotidian*, or there will be a Circuit compounded of those two single ones, and answering alternately to the *Quotidians* from one 24 Hours to another. But if there is not given this exact Order of Time, the Returns will answer to one another un-

uncertainly, or in no Order at all, as the *Lentor* producing them is accumulated uncertainly, or in no Order. But as a certain Quantity of *Lentor* is required to the Production of a new Fit, if therefore it is accumulated in an uncertain Time, its Quantity also must be uncertain, that is, in no certain Condition, sometimes greater, at others less, more or less viscid, or fluxile, and in no certain Condition of Quality, which all necessarily contribute to this that the Quantity sufficient to bring on a Fit is accumulated in an uncertain Space of Time.

Fifthly, These Accumulations are possibly produced either regularly or not; and as they result from procatactick Causes acting upon the Blood, so as to change it into a *Lentor*, such *Lentor* will be generated, and accumulated in the Veins regularly or not, as such procatactick Causes do certainly or uncertainly act upon the Mass of Blood; so that if Cold, or any Humidity hindering Perspiration is perceived at any particular Hour, from which it goes on for 24 Hours, we shall then labour under such Indisposition so long, and the Fit will be a *simple Quotidian*; but if after the first Fit either Cold or Humidity occasions a Re-accumulation

The Accumulation of this Lentor regularly or not, from procatactick Causes, or

of

of *Lentor*, suited in like Manner for the same periodical Returns, there will then be produced a *double Quotidian*: But if a *Lentor* of another Kind be generated, the Returns and Circuits will be of another Kind; and as Cold and Humidity operate in a certain Time, and according to their Efficacies in the Production of *Lentors*, at different Intervals, or appearing at different Times, as they are in greater or lesser Quantity, or more or less viscid, there will result a Complication of Circuits and Returns, either regularly, or in any imaginable Uncertainty. The same will also happen from an Augmentation or Diminution in the Motion, or Quantity of the Blood, and the like Affections as above explained.

From an Influx of Lentor. But the like happens by Accumulation, whether from an Influx of *Lentor*, or of a coagulating Liquid generating a *Lentor*: As suppose, for Instance, in the first Place, some considerable Portion of the bilious Duct to be obstructed, either totally, so that its whole Cavity is filled up, or only in Part; in the natural Flux of the Blood then from the *Porta* into the *Cava*, the whole Quantity of Bile that is naturally secreted, cannot pass through Canals less previous than natural, and therefore part of it will flow through the capillary

pillary reducent Veins towards the Heart: But since the Capacities of these are fitted only to the Circulation of Blood through them, they will therefore be too strait to admit of the Passage of Bile through them; and as this is viscid, the same contractile Force cannot pass it through those Capillaries, with an *Impetus* natural to the Blood, but much slower, whence it will adhere, and by a continual Current of fresh Blood and Bile be accumulated in those narrow Canals to a great Quantity, whence at length it will be wholly washed away into the common Stream, after it hath received so much Pressure from the following Blood, as is sufficient to separate its Cohæsions with the Vessels, and then it will bring on a Fit of Cold. If then this Obstruction continues in the bilious Ducts, and there is required the Space of one, two, or three Days for such an Accumulation in the Vessels, as will increase the compressive Force enough to separate its Cohæsion with their Coats; after such Times therefore there will recur the like as happened in the first Fit, and there will follow others regularly returning, and terminating in their Circuits. Let the bilious Particles then be supposed to be obstructed only in Part; during such a partial Obstruction therefore less
Bile

Bile will flow through the Veins; and if this obstructed Bile cannot then be continually washed away with the circulating Blood, but will remain in the Ducts, there will be a longer Time requisite for its Accumulation in Quantity enough to cause its Separation from the Vessels, by their increased Contractions, than when it obstructs in greater Quantity; because such a less Quantity gives greater Resistance to that transverse Force which should loosen its Cohæsions with the Vessels; and when it is separated from those Contacts, there will yet be required a longer Time for its Accumulation, since it must flow from the Arteries into the Veins of the whole Body, in the same Manner as it flows with the Blood through the Vessels of the Liver. Wherefore it is to be expected, that as long as the bilious Ducts are re-obstructed, there should happen Returns of Paroxysms, and that regularly or not, correspondent to the forementioned Circumstances, as the Obstruction is greater or lesser, or the same with that whence the foregoing had their Origin.

But if in the same Liver there should be some other considerable Portion of the bilious Ducts obstructed, after the Manner as already explained, but that such Obstructions are sometimes

times sooner and sometimes later, yet both in the Liver at the same Time, it is manifest that from both these Obstructions there will accumulate a *Lentor* in the Vessels, but that the first *Lentor* will arise from the first Obstruction (supposing the Quantity of Obstruction, and the compressive Powers to remove it be equal) and the following from what happens after; and therefore will there be Returns and Circuits compounded of both, which will regularly answer to one another, if those Obstructions are not changed in their Conditions; but if they are irregular, these will happen also irregularly; if they now happen, and then are removed, the consequent Paroxysms will also correspond therewith: But these Obstructions will orderly recur, while there remains the same Quantity of Blood, the same Qualities, and the same compressive Powers, for while these subsist, there will be yielded the same Quantity of Bile, to be conveyed through its proper Ducts, and therein obstructing until the contractile Powers of the Vessels can again force it away; when therefore either the Quantity or Quality of the Blood, or the external Compressure of it from the contractile Vessels, are not the same, there will not be the same Propensity to Obstructions,

structions, nor will the compressive Powers be urged to conquer them within the same Periods, and therefore will there be no Regularity, when sometimes very much, at other very little, and at other no Bile at all flows through the Veins, and consequently makes the subsequent Paroxysms very uncertain. And it easily appears how in a natural State, as well as a distempered one, the Quantity and Quality of the Blood, and the Compression of the Muscles of the Abdomen, and those assisting Respiration, may continually be changing; and if all these Diversities can happen from the Affections of one *Viscus* only, what may we not expect from an Affection of many *Viscera* together? And that this may be the Case is very certain, especially where there is some Change in the whole Mass of Blood, whereby only vitiated Humours can be discerned from it, which generate Obstructions in the Canals and Glands. Concerning this Kind of *Lentor* therefore the Case is very plain.

From the Influx of a coagulating Liquid.

And in the same Manner does it happen from a Liquid that coagulates the Blood into Viscidities: In the first Place then, let the same be put as before concerning the Obstruction of one *Viscus* only, and a Portion of Bile return-

returning through the Veins, be supposed obstinately to adhere to them, so that it cannot but with Difficulty be got away, and requires for that Purpose a daily and forcible Compression; from such Compression therefore will that which is most liquid be separated from the more adhæfive Parts, and carried into the Veins of the whole Body; where then such Liquid, as amounts almost to the Subtily of Spirit, is suited to generate a *Lentor* in the Blood, it will generate it, and bring on a Sense of Cold with all its Attendants; and here it is convenient to remark, that such a Liquid will either generate a *Lentor*, as soon as it comes into the Blood, in which Circumstance it will immediately occasion a Paroxysm, or it will require some Time, and repeated Circulations, before it can make such a Change in the Blood, or upon it self, or both; and if these are necessary, then the Attacks of the Fits will proportionably be delayed. This *Lentor* however from hence at length comes into the Veins, and there is a Paroxysm produced by it, which will not be succeeded by any more, but by the same Obstruction and Adhæsion in the Hepatick Vessels. And as it appears from what hath been already said, that such Attacks depend upon the Obstructions, and those Ob-

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structions

structions upon the Influx of a coagulating Fluid, therefore such Insults or Attacks will be regular or not, in Proportion to the Regularity or Irregularity of the influent Liquid. And from hence it moreover appears, that all these enumerated Affections may ensue, not only from many Obstructions at the same Time in the same *Viscus*, but even from one single Obstruction; and that this one shall be able to bring on all the Paroxysms, either by its own *Lentor*, or the Communication of a coagulating Liquid expressed from it, or by both together, where the more viscid Part can be carried along with the Current out of the Hepatick Vessels into the common Mass. But where this happens to many *Viscera* at the same Time, the Consequences will be yet more easily effected, in a great Diversity of Returns, either with Regularity or not.

But because, Secondly, this Liquid is supposed to generate a *Lentor* that cannot be found in a natural State, it must therefore be generated either from a vitiated Blood, or from distempered *Viscera*, or both; if therefore the Blood is not always in the same Manner vitiated, or at least equably, neither can this Liquid be equably generated; and in like Manner if the Distemperature in the *Viscera* is not always the same, the
coa-

coagulating Fluid cannot be always regularly and equably produced: And that the Blood may be vitiated in a very different Manner and Degree, is demonstrable from the Actions of the Mind and Body, Meats and Drinks, and a thousand of the like Circumstances; and the Disorders of the *Viscera* consist chiefly in a Change of their external Compressions, and the Velocities of their Contents in different Capacities, and which by Obstructions, Inflexions, and Compressions of their Vessels, may be distempered a thousand Ways. Neither on this Account only, from a regular or irregular Generation of a coagulating Fluid, will the Paroxysms be regular or not, but also because this Fluid, when it is brought into the Blood, may require many Circulations with it before it can change any Part of it into such Viscidity, and which, according to the different Qualities of the Blood, (which is much varied by Diet, Exercise, Medicines, &c.) will be effected sooner or later, equably or not, as that more or less deviates from its natural State. But if the Derivations of this Fluid be from many Parts of the same *Viscus*, and they happen not all at the same Time, or if it be in the same Manner circumstanced from divers *Viscera*, there will

ensue a Multiplicity of Returns, either regularly or not, as was before explained of a *Lentor* immediately derived into the Blood. From the whole therefore it is manifest, that whatsoever hath been said concerning the Generation of a coagulating Fluid, whether by a Fault in the Blood, or *Viscera*, or both, may also, and ought, to be asserted concerning the Production of that *Lentor*, from whence, independently of those Disorders, we have deduced the Returns of the Paroxysms, &c.

*How the same
from the
Chyle.*

Thirdly, If it is possible for the Chyle, or any other Juice that is to pass into the Blood, to be generated in a natural State, when the Blood it self is distempered, (which it is difficult to admit of, and dangerous to assert) and that this natural Juice, when it comes into the Blood, is changed into a Viscidity, or a coagulating Liquid, there will then from hence also be excited regular or irregular Paroxysms; for if the Blood be always in such a certain Degree of Distemperature, and the Juice flowing into it always of the same Nature, there will always be the same Interval of Time requisite to change this natural Juice into an unnatural State, which Time may be one, two, or three Days, &c. but if either of these, or both, are of different Natures, the Course

Course of the Periods will be changed, and the Paroxysms become irregular: But if this natural Juice be derived at different Times from the same or different Parts, and immediately in the same Intervals of Time acquires a distempered State, from a distempered Blood, there will ensue a Multiplicity of Returns regularly or not, as such Derivations are in like Manner circumstanced; but if such Juices are of different Natures, that is, consisting of Parts of different Properties, every one requiring different Spaces of Time to the Production of a *Lentor*; or if they are unequally viscid, there will be a Multiplicity of Returns altogether uncertain, and in no Order at all: From all which we at length conclude, that in these several Ways of generating a *Lentor*, or a coagulating Fluid, there is avoided that wonderful Retardation in the Veins, as was explained in the foregoing Propositions. Hence no Retardation of the Lentor, as before explained.

But to proceed, because from sharp Sounds only a Sense of Cold may be excited, as with the Noise of a Mill, the Polishing of Brass or Metals with an acute hissing Sound, as is made by the turning of Wheels, and which will give a Shivering, and set the Teeth on Edge; now Sound is a Motion of the Body, and therefore Occasions may be

A cold Ferment may be mixed with the Blood, so as to excite Cold, and produce a Lentor.

given, wherein by Motion a Sense of Cold may be excited without the Supposition of any *Lentor* præexisting in the Blood. If therefore some Fluid, whose Motion gives the same Modification to the Perception as these Sounds, comes in such Manner to be mixed with the Blood, that it does not thereby lose its Energy, there will then be excited a Sense of Cold without any præexisting *Lentor*. But here we must allow, that although such a Fluid, or frigoriffick Ferment, may mix with the Blood, and excite a Sense of Cold, without any præexistent *Lentor* in it, yet the Consequences of its Exertions will be a Viscidity and Coagulation of the Blood, unless somewhat hinders it. Now because this Ferment is supposed to excite a Sense of Cold, therefore its Energy consists only in deadening these natural Tremors of the Nerves, by which Heat is propagated, or in giving some other Tremors contrary thereunto; and the Quantity of Tremor in the Nerves from Heat, is as the Quantity of Motion in the igneous Particles; where therefore such a Ferment hath a Power of destroying this Tremor, or giving a contrary one to the Nerves, it cannot but be much more able to stop the Activity of the Heat it self: And because by Heat the groffer Parts of the Blood are kept

kept from Cohesion, where therefore that is restrained and rendered inactive, the Blood will coagulate, and run into a *Lentor*, (for that Blood that is found fluid in a Carcase, is either watery, distempered, or putrid) as Experience does evidently testifie, and likewise that natural Blood will coagulate with Cold. When therefore the Blood is coagulated by this Ferment, there will be Returns of Cold, with all the Attendants of a Paroxysm.

But because the Blood's Fluxility may not perhaps altogether arise from Heat, or although it does arise from Heat in a natural State, and there may be somewhat that is not natural to it found, which, when mixed therewith, will preserve it fluxile and liquid, as Salt will hinder its Coagulation, and yet restrain its Heat at the same Time, so that the same Salt makes it liquid and cold at the same Time; hence if such a Ferment can be found that will restrain the Heat, and preserve the Blood in a State of Fluidity at the same Time, then there will be Insults of Cold without a *Lentor* in the Blood: But that the several *Concomitants* may follow which always attend upon Cold, it is necessary that by this Cold the Blood be thickened, so far as to render the Pulse weak, depressed, and small, by

How a frigidiffick Ferment may be mixed with the Blood that will keep it fluid at the same time.

too sparing a Separation of Spirits; but this increased Thickness is in such a Manner that comports with its greater Viscidity, but not so as to make it consistent or hard, for a Thing may be rendered thicker, that is, its Parts may be brought nearer together, and under a greater *Nisus ad Contactum*, without reaching into an intimate Cohæsion, on which Cohæsion the very Effence of Consistency or Hardness depends; and of which Species is a *Lentor*. It is moreover necessary, that the Blood should continue in this State as long as the cold Fit continues, on the Termination of which likewise the Heat necessarily breaks out, so that there is an Augmentation of its Perception, and it is in a higher Degree than in a natural State; and this will certainly come to pass when such a Ferment, which is able at first to suppress the Heat, is gradually subdued, and the Blood grows more fluxile, so that the igneous Particles at length break out with great Force; but this at first is rendered the more difficult, because the Debility of that Motion, when joined with a Perception, may go so far as nearly to generate a *Lentor* in the Blood.

And therefore As to the Order wherein the Cold
Paroxysms arrives to the several Parts, more or
with Cold, less, with all its usual Attendants, it
without a does
Lentor in the
Capillaries.

does necessarily depend upon this Ferment, as will easily appear from the Demonstration of the *eighteenth Proposition*. These Conditions therefore being given, there will be generated a Series of Paroxysms coming on with Cold, and all the other *Concomitants*, without a *Lentor* adhering in the capillary Arteries; all which we undertook to demonstrate in the first Place.

The second Part of the Proposition appears from the Demonstration of the first; for all those Things which are singly enumerated and demonstrated in *that*, are to be affirmed and proved after the same Manner in *this*, by changing the *Lentor* with Cold, into a *Lentor* with Heat; and the Attacks of this may in like Manner be made appear to recur, not only by such a *Lentor* returning with a very slow Motion thro' the Veins into the Arteries, but by its total Consumption in every Paroxysm, the Heat and Agitation of the Blood remaining till a new Fit, which will be occasioned by a Re-accumulation of a fresh *Lentor* in the Blood, generated either within its own Mass, or derived into it from without, with all the Diversifications from regular, simple Paroxysms, to the most compounded and irregular; and in like Manner may it be shewn, how Paroxysms with Heat
are

are the Result not of a *Lentor*, but a Fluid setting the Heat at Liberty, without any necessary Consequence of a *Lentor* afterwards in the Blood; whence the whole of this second Part is made appear, and consequently is the whole *Proposition* demonstrated.

COROLLARY.

Because it is therefore possible for Returns of Fits with Cold or Heat from the same *Lentor*, often returning through the Veins into the Arteries, it is possible also for the same to be produced when it is wasted in every Fit, by a Re-accumulation of a new *Lentor*, in like Manner for every Fit: If therefore a Case is given, wherein every Paroxysm is the Effect of a new *Lentor*, in Conjunction with a *Lentor* that is in the mean Time generating another Fit, or which of its self would produce another by its Remainder in the Blood, there will hereby be easily brought about a Multiplicity of Returns, either regularly or not, in Proportion to the Times of Mixture between the recurring *Lentor* and the accumulating new one; and the Multiplicity and Irregularity of these Returns will be the greater, where the Accumulations of new *Lentors* are at different Times, from different Parts, and of different Quantities and Qualities.

PRO.

PROPOSITION XXI.

The particular Symptoms which are necessarily produced in the Body, from both the Disorders of the Blood above explained; that is, a Lentor which begins its Attack with Cold, and one that comes on with Heat.

Although it is demonstrated in the last *Proposition*, that the Insults of Cold and Heat, with those *Concomitants* above enumerated, may arise from a Liquid producing such Affections without any *Lentor* in the Blood, therefore if we were regularly to enquire into the Consequences of both, any one would justly think the same way of reasoning to hold good, touching the ways of producing both Cold and Heat, that is to say, what would follow in the Body when Cold comes from a *Lentor*, and what when from a coagulating Fluid, or a frigoriffick Ferment, and in like manner must we proceed concerning the Affections of Heat; but because what we have hitherto examined, and what we are now going about to enquire into in this present *Proposition*, is only

ly in order to explain the Nature of a Fever; that it may therefore be more plain to us in the following *Propositions* from its *Antecedents*, *Concomitants*, and *Consequences*, we shall rather choose to fix its Origin in a *Lentor*, than a coagulating Fluid; and hence we shall have nothing more to be satisfied in, than what are the Consequences of Cold and Heat from a *Lentor*, but not from a Liquid. And because therefore, whether Heat follows a cold Fit, or whether it comes of its self without any preceeding Cold, the Heat is always of one and the same Nature, and of the same Exertion and Operation, consequently that Heat is not to be separated, and as it were distinguished, when it succeeds a cold Fit, from that Heat which comes on without Cold, as to its manner of Operation; and therefore from both will result the same Affections, and nothing else will call for our Consideration, than Cold and Heat, and what necessarily happens in the Body all that while the Cold and Heat lasts, whether the latter succeeds the former, or happens without it.

From Cold in
the Head.

If then the *Lentor* which seizes with Cold is so viscid, that it cannot be dissolved by a Thousand Occursions in the Contactions of the *Pia Mater*, a lesser Quan-

Quantity of Spirits will be separated from the Blood, and this lesser Quantity may be in such a Degree, as is not sufficient for the Performance of the sensible Functions, or hereby will be produced Spirits naturally more sluggish, on which Account only they will be more unfit for the Offices of Sensation; or if the Quantity of Spirits separated in this Circumstance be greater, or very near, or quite equal to a natural State, where the *Lentor* is mixed with an aqueous Humidity, so that the Brain is too much moistened, or the Nerves grow flaccid, from the Nature of Sensation it is manifest, that from all these Causes the Body will be as in a State of Sleep, and therefore a Person seized in such manner with Cold in the Head, will be thought to sleep; which will also the sooner happen, because the Patient seeming to sleep will be moved with greater Difficulty, thro' a defect of Spirits, or thro' their weakened Energy, from too great a Participation of *Lentor*, and an aqueous Humidity: But one thing will happen from this Circumstance yet much more strange, and that is a trembling, or shaking of the whole Body, under that very Appearance of Sleep, which is nothing else than the Tremor before explained from an uncertain and unequal Influx

Influx of a Fluid through the Nerves, and of Blood into this or that Muscle.

Stupor of the Mind.

From this very Cause is produced a Stupor of the Mind, that is to say, as often as there happens a diminished Quantity of Spirits, or when they become more watery or viscid; for after the same Manner as the Waves or Flux of Spirits, at the Time of Sensation, is interrupted in the Nerves in any particular Circumstance, they will also be disturbed in the Brain; and as they are necessary to the Operations of the Mind, the Mind cannot in such a Circumstance act, or will be stupify'd; and this all the while the Instruments of

and external Sensation. external Sensation are in their natural Order.

On the contrary it may likewise easily happen, that one or all of the external Senses may be disordered, or quite destroyed, while the Mind continues in its natural Powers, and regularly exerts its rational Operations: For suppose this *Lentor* by any Accident should be accumulated in a greater Quantity upon this or that Artery, or upon any *Plexus* or Complication of Arteries, and that these Arteries are likewise inflected, implicated, and wraped about those Nerves which are distributed to the Organs of Hearing, Sight, or Taste, &c. In such a Case therefore the same Arte-

Arteries will grow more obstructed by a continual Afflux of new Blood, and their Coats will be more thrust outwards; and the Nerves within their Contacts or Implications will be more compressed, insomuch that at length, by a continued Accumulation, the Nerves will be wholly closed, and the Passage of Spirits through them entirely cut off; or their Flux may be hindered, without a total Stoppage of the Nerves. Hence therefore it comes about, that a Person suddenly loses his Hearing, his Sight, or his Taste; but upon a Termination of the cold Fit, those Senses as suddenly return again, because the *Lentor* is then forced through into the Veins.

From the same Necessity it appears *A Palsy* that a Privation of Motion may happen in this or that Muscle, without any Regularity or Certainty, wheresoever there is a Defect of animal Spirits from the same Causes, or the Blood is so forcible penned up in the Arteries of this or that Muscle, that none of it can get into the small Fibres constituting those Muscles.

A *Delirium* may also happen from *A Delirium* the same Diminution of the Spirits in Quantity, for in such a diminished Quantity there will not be enough to continue the usual Waves through the Nerves,

Nerves, or to repeat their natural Vibrations, whence they will leap into Irregularities, and excite in the Brain incoherent Species, that is, there will be a *Delirium*. The same will happen where the Spirits are separated of too active a Nature, by the too forcible Compression of an aggravated *Lentor*, for such of themselves will strive and leap in all manner of Directions, and excite this or that Species at Uncertainty, or by Accident; the like also if such an obstinate *Lentor* occasions a Stagnation in the Brain, that its Membranes as it were grow stiff and tense; and in the time such Tension is made, there will be actually some Species excited; in that Part of the Nerves therefore which is shook by the Motion of those Species, there will be less Tension and Stiffness; whatsoever Spirits therefore remain after the Tension of the Nerves, a Motion will easily be excited in them sufficient to the Production of that Species which gives least Resistance thereunto, or there will be produced a *Delirium*.

A Phrensie.

But if a greater Quantity of *Lentor*, or a lesser Quantity, with an aggravated Viscidity, accumulates upon the Brain, so that it cannot be dissolved, or broke away into the Veins, either by the following Blood, or the proper *Nifus* of its

its own Particles endeavouring to disengage themselves and disperse, there will happen a greater Pressure of the Arteries outwards, or a more sensible Distention, continuing even after the Cold; and from the Expiration of that Period, with a Succession of Heat, and an Afflux of swifter and hotter Blood, if this Viscidity cannot be yet dissolved and broke away into the Veins, this Distention will still become greater, and the Part more hot; that is, there will be an Inflammation, or a Phrensie, whose Origin was from Cold.

Hence will easily follow Pain in the Head, with a Sense of Tension, Throbbing, Weight, and Pricking; and such Tension will arise from the *Lentor* obstructed in the Arteries, that is, from its Protrusion and Distention of them outwards; the Throbbing from a Hindrance to the Passage of the affluent Blood by the obstructed Viscidity, which makes it more perceptibly thrust against the Arteries, through which it should flow; the Weight from a greater Accumulation of *Lentor*; and the Pricking, when with the *Lentor* any Thing is mixed that is sharp and vellicating.

But in such an unnatural State of the Blood as this, where it is joined with a *Lentor*, or disposed to Viscidity, either nutritive Particles will not be

S gene

generated in it, or such as are not wholly natural; and moreover as from that Heat which succeeds the Cold, all the aqueous Humidity, which is not only nutritive, but also lubricating to the solid Parts, is consumed, from both which Sleep is produced, therefore even during the cold Fit will Watching continue.

Hemorrhages. Suppose further this Obstruction from *Lentor* to be very obstinate in some Vessel either within or without the *Cranium*, so that the affluent Blood thrusts very hard against that very Artery, it will be forced in some Measure to recoil, and press against the next Arteries on all Sides; whence if its greatest *Impetus* happens against a Part naturally or accidentally weak; that is, consisting of such very thin Membranes, as are not able to withstand its *Impetus*, that Part will be broke through, and the Blood flow out, or there will happen an Hemorrhage; and as such an Artery chances to be in the Ears, Eyes, &c. the Hemorrhage will be upon those Organs; and after the same Manner may there be made a Rupture in that very Artery where the *Lentor* is obstructed, if it cannot resist the Force of the affluent Blood.

Inaptitude to Motion. Suppose again the *Lentor* to be so great, that it even fills the Arteries in the

the Brain, and that it be so obstinate and adhæfive in its own Particles, that it cannot be broke by a thousand Occursions in the *Plexus's* of the *Pia Mater*; and if from hence it comes that no Spirits flow through the Nerves, either because they cannot be generated in so viscid a Constitution of Blood, or altho' they may be generated in some small Quantity, because they cannot be discerned into Canals quite shut up, in this Circumstance there must be an intense Cold through the whole Body; for the *Lentor* will be in the highest Degree obstinate and adhæfive, with a Suppression of Motion and Sensation, or the Body will be as a dead Carcase; it will become rigid and stiff, so as not easily to be moved in its Joints, with a Congelation of its aqueous Humidities, and a Contraction, and Tension of all the Solids from the same Cold; Respiration will be suppressed, and the Heart's Motion, so far that the Blood cannot be agitated nor kept in its circulatory Motion, whence there will be an easie Change into Death it self. And as we have demonstrated in the *Corollaries* to the *twenty-sixth Proposition* of the *first Part* of a Discourse concerning *Respiration*, that the Motion of the Blood may for some uncertain Space of Time be suppressed without the

absolute Death of an Animal, although seemingly so; and that an Animal may in such a Case return to himself, and the Operations of Life, if within such Space of Time the stagnant Humours of themselves ferment, and keep in Motion: Where therefore a *Lentor* is broke, before it is so far degenerated from the Nature of Blood as to be utterly incapable of vital Motion, that Body, which was to Appearance dead, and a mere Carcase, will glow into a fresh Warmth, and renew its vital Actions.

Thirst in the Mouth only.

But if this *Lentor* accumulates in the Arteries, whence the Spittle and natural Moistures of the Mouth are secreted by their proper Glands, so that no such Secretion of Moisture can be made, there will not therefore be given any Afflux of Humours to those Parts, whereupon they must grow dry, and from such Dryness will proceed a Sense of Thirst: But all this while, if the rest of the Body is not thus dried from the same Cause, but moistened with its natural Humidities, or a *Lentor* that is more aqueous, there will not therefore be a Sense of Dryness, and a universal Thirst in the other Parts of the Body.

But if this *Lentor* is not so very obstinate, its less viscid Parts may be separated in their slow Motion thro' the salivary Glands,

Glands, but yet more viscid than a natural Spittle, and which, when drained into the Mouth, will be clammy and adhæfive; and according to the different Natures of it, will it be differently coloured, but those Diversities cannot be reduced to any certain Standards. Hence the Tongue will be dry and rough, from a Dryness and Hardness of the *Papillæ* on its Surface, which in an Afflux of moist Spittle are soft and yielding; it will be black from the stagnant *Lentor*, or from the Tinge of bilious Vapours from the Stomach, which as they are in but small Quantity, that is extended thin upon its Surface, they will stain it at first but weakly; but afterwards grow deeper, till it becomes quite black.

*The Tongue
rough, black,
&c.*

But because the *Vertebra* are the most thick of all the Bones, and less moved than any of 'em; and as the Ramifications of the capillary Arteries are dispersed through all their *Sinus's*, and there is internally no lateral Compressure, and the least imaginable against the larger Vessels running into their Cavities, both by Reason of very little Action upon them from the Motions of the *Vertebrae* themselves, and the insignificant Motion of the Muscles; therefore the *Lentor*, which is distributed into such Vessels, as have neither Compression upon their Capillaries, nor larger Trunks, will with

*The most intense Cold in
the Back.*

great Difficulty be pushed forward, so as to pass through the Arteries into the Veins: Wherefore if it be very tenacious, and strongly adhering to the Membranes, it will occasion a Perception of Cold in the Back, not only after such Perception ceases all over the Body besides, but even after the rest of the Body is grown considerably hot; and this Perception of Cold will remain there for some Days, according to the Quantity of Compression such a *Lentor* requires before it can get through into the Veins; or if it be incapable of such Circulation, until it ferments of it self, and thereby grows so fluid as to pass into the Veins, or waft by Perspiration. But it is very manifest, that this Duration of Cold in the Back cannot be caused by the Blood contained in the *Cava*; for in the first Place it is apparent from the preceding *Propositions*, that according to the Order wherein the Cold comes on, it is first felt in those Parts, where most Capillaries are dispersed, and that in the larger Trunks the *Lentor* is confusedly mixed with the more liquid Blood, from which the Heat is able to disengage it self, and exert it self so much into Motion, as will destroy all Perception of Cold: Again, Secondly, as it is certain that upon the Cessation
of

of Cold, the Blood also which is contained in the Trunks of the Canals is hot; if therefore the Cold which is perceived in the Back proceeds from the Blood in the Trunks of the Vessels, when the same Blood grows hot the Cold would vanish, but that does not always happen. Nor does it come from the Vessels dispersed through the spinal Marrow; for they are distributed through that as through the Brain, that is, they intersect one another Abundance of Times, and by that Means break the Blood into a State of sufficient Fluidity; add to this, that so intense a Cold, that is commonly protracted for many Days together, would chill and thicken the nervous Fluid, or would at least retard the Influx of Blood into the medullary Glands, (that is, by the *Lentor* obstructing the Vessels) from whence there would be some Defect in those Parts that are supplied with Nerves from the spinal Marrow, as a Privation of Sense, or Motion, or both, which we see does not happen; and therefore what was proposed does appear to be true.

But in the Breast there does easily ensue a slower or a more frequent Pulsation of the Heart, according to the slower or quicker Passage of the *Lentor* in the Vessels, after the Manner as was explained to happen in the Tremors of

*Palpitation of
the Heart, and
an intermit-
ting Pulse.*

any of the Muscles: But if this *Lentor* is so obstructed, or in such Manner adheres to the Arteries, that it requires a very long Time for its Protrusion through the Vessels of the Heart; or if it presses against the Nerves adjoining to the Arteries, or insinuates into their Cavities; or if the nervous Fluid it self does not flow into the Nerves of the Heart, from a like Compression upon their Origin in the Brain; or if it be thicker, and on that Account moves slower; or if from all or any of these Causes it comes about, that the Heart cannot alternately contract within its natural Spaces of Time, there must then be an intermitting Pulse. Yet although the *Lentor* should be so great and so universal all over the Body, that very little Blood flows back through the Veins, whereby its Flux is not continued, nor distends all the pulmonary Vessels, therefore there will not always be in Readiness a sufficient Quantity of Blood in the Auricles of the Heart, at the Time of its Restitution, and consequently will its Contraction be on another Account, than that which is made in the Arteries; whence Syncope's, Loss of Strength, &c.

Syncope, &c. Because also the Blood is viscid and cold, the Blood will therefore flow easily enough through the Lungs, until it hath acquired a certain Degree of Viscidity,

dity, but when it goes beyond that Measure, it will then flow through them with more Difficulty, or stagnate; whereby there will be excited that troublesome Sensation, which we customarily endeavour to throw off by strong Respiration, and fetching the Breath deep, as in Sighing; and if by such Means *Sighing.* the burthenfome Humour is shook away from its Lodgment, and carried into the pulmonary Veins, the Lungs will then become easie, and no other Inconveniencies thence ensue; but if it yet adheres obstinately, and cannot be removed, the Arteries will more and more be thrust outwards by the affluent Blood, which Circumstance, attended with an Increase of Heat also, will generate an Inflammation. *Inflammation.*

If by too great a Quantity of *Lentor*, or Consumption of Strength, or any other Cause before enumerated, sufficient to occasion Death it self in the cold Fit, whosoever doth so die, as it may often happen, will have upon the Superficies of their Lungs manifold *Variegation* like to the Branchings of Trees, *on the Lungs of those who die in the cold* from a hard, livid, or black Blood; and the *Lentor* it self, which at such a *Fit*.

Time is passing through the Lungs, may, by becoming more viscid and compact, so obstinately adhere to the Vessels, as

to stop entirely the Blood's Motion, and bring on Death.

The Bile
thicker or
thinner than
natural.

But as there are many *Viscera* in the Abdomen, wherein Humours are secerned from the Blood, during the cold Fits Continuance, every such Humour will be separated more viscid than natural, and such as partakes of the original *Lentor* it self. Therefore in the Liver, either the Slowness of the Blood's Motion, in Conjunction with a *Lentor*, is such as will admit of a Separation of Bile, but such a one as is thicker than natural, because it comes from a Blood so circumstanced it self; or if such Retardation, in Conjunction with a *Lentor*, is less than is required for its Separation with its natural Viscidities from the same Blood, and its Derivation into the biliary Ducts, then only the most thin Parts of the Bile will be separated, and a Cholor produced that is fluxile; and both these will have their Disorders, and be of different Efficacies: The thinner Parts, which will be, as it were, the Spirit of the Bile, will operate according to its peculiar Activity and *Impetus*; and the thicker Part, in Proportion to the Quantity of its constituent Particles, which in so small a Bulk will be very great.

And the like
of other Hu-
mours.

The like Conditions of Secretion will happen to the Humours separated in any

any other Part of the Abdomen; and so in both those Respects that Juice which is separated in the Glands of the Intestines will be vitiated; the like to that in the Spleen, of whatsoever Kind that Humour is; and so of all other Humours whatsoever that are separated in any of the abdominal Glands.

Because the Urine is a Fluid, consist-^{The Urine}ing of earthy and saline Parts floating^{thin, crude,} in a Lymph; and of which the former^{&c.} are more difficult to Motion in Proportion to their Dryness, and the latter more easie, but capable of being coagulated by Cold, and of Mixture with any Viscidities and *Lentors*, the earthy Particles will find a greater Difficulty to be disengaged from those viscid Implications of *Lentor*, which on all Sides surrounds them, in such a State of Blood as that of the cold Fit; and the more so, because during that Space the compressive Force is least: But whether the Blood be supposed to flow through the Kidneys freely, or if it does not flow so free as naturally, yet it will be able to implicate these hard, and less moveable Particles, which will therefore affect the Urine, so that what is made during this will be crude, because the most aqueous and liquid Parts will flow through the Glands, and leave these

these rigid ones behind in the Viscidities, that will not be able to pass; which likewise will diminish the Quantity let through, and cause the Urine also to be at this Time made but sparingly.

Heart-Burn,
Hiccup, Nau-
seousness, &c.

Further, when the Juice of the Stomach is separated in an unnatural State, in its Passage through the secretory Glands into its Cavity, it will give a Sensation different from what is natural; nor will this be such as a Sense of Hunger, unless this distempered Juice be so conditioned as to excite Hunger, after the same Manner as it is produced, when all things are well in the Stomach; and therefore as this Juice alone is viscid, sharp, corroding, or penetrating, will there be a feeling of something in the Stomach like Constriction, or rubbing, or of Erosion and Pungency, &c. whence Pain, Heart-burn, Hiccup, &c. But all these Symptoms are producible from Bile only; for if that is viscid enough to adhere to the Coats of the Intestines near its emissary Duct, so strongly that the Contractions of the Intestines cannot separate it, it will continually collect in the *Duodenum*, until by its Quantity it regurgitates into the Stomach, where it will produce those enumerated Complaints; and the same Regurgitation may happen from a less viscid Bile, where

where the Intestines are greatly contracted, as it happens from extreme Cold, or Convulsions; when therefore the Bile is got into the Stomach, its more thin Parts, as it were, filter up the Sides of the OEsophagus, communicate a Bitterness to the Palate and Tongue, and stain it with Discolourations. In this distemper'd State therefore of the Stomach, whether from a Derivation of its own Juice in an unnatural Condition, or of Bile, or both, there will follow not only an Inappetency to Food, but a Loathing against it, or an Aversion to it; for there is somewhat already in it that engages its Perception with Uneasiness, and which is endeavoured not to be got rid of by taking in Food, but by Hiccup, Vomiting, and such like convulsive Motions, or by abstaining at least from taking in any thing at all, which can have any Manner of Efficacy upon it; and whatsoever kinds of Food are at such times taken in, they occasion great Disorders, and Nauseousness, insomuch that if such distempered Juices are collected in great Quantity, they will by every slight contractile Motion be thrown up by vomiting; or if they are so vellicating, although in a less Quantity, as to force the Membranes of the Stomach into strong Contractions,

ons, the *Nausea* will be changed into Vomitings of unmixed Bile, of some kind of Colour or other, as it hath been accumulated in the Stomach by it self, or in Mixture with other Humours, which have been also derived into it.

A Flux
the Belly.

of But if any Humour whatsoever, whether of the Stomach, Pancreas, Liver, or Intestine, should be drained into the Intestines, in a greater or lesser Quantity, and find them not too much constricted, in case it is not so viscid as to adhere to their Coats, it will flow through them in a natural Manner, and produce a Flux of the Belly; and even if the Intestines are too much constricted, when the Quantity of such Humour is great enough to overcome the constrictile Force, it will notwithstanding make its Vent through, some Way or other: And if it be nearest to the Stomach, it will get into that, and come up by Vomit; but if the whole Length of the Intestines is to be conquered, and a greater Resistance to be broke through, it will happen to be a *Diarrhæa*. But supposing the Bowels are in this Manner constricted, and the Quantity of offending Humour be but small, so that it hath not *Moment* enough to force open to it self a Passage through them, yet if
by

by its Accrimony, or Fluidity, it is either endowed with a natural Efficacy, or a Derivative one from Compressure, or both, sufficient to dilate the intestinal Conveyances, there will then happen a Flux, after the same Manner and from the same Necessity, as any other Flux can happen, of what kind soever, as is in it self manifest.

Again, supposing a *Lentor* not yet so ^{Uncertain} tenacious, to be accumulated upon any ^{Tremors in} Part naturally debilitated, or made so by ^{divers Parts.} some Disorder or Custom, so that the *Lentor* cannot, by the utmost Compressure possible be forced away out of the Arteries, and carried into the Veins; its most thin Parts in this Circumstance will be squeezed out, or more intimately compacted with the other; wherefore on both Accounts there will ensue a Hardness, which if it cannot be conquered by the affluent Blood, even in its hottest State, will by such continual Afflux accumulate into a Tumour; and that either by a waste of its most liquid Parts, or a more compact Consistence, will degenerate into a *Schirrus*, in one or another Part, without any certain Rule, unless it can arrive to such a Degree of Heat, as to ferment; in which Case too it will not soon be carried away, but cause an Inflammation; and so of any other Humours.

But

A partial Pa-
ralysis.

But if this same *Lentor*, which is the Foundation of Tumours, should so accumulate upon the Nerves, muscular Fibres, or Arteries, as to obstruct the Passages for the nervous Fluid, or Blood, or both, into their proper Canals, or so to press upon the Fibres, as to close them up, or fill them with Viscidity, there will happen a Palsie of that Muscle where its Nerves, or Arteries, or both, are thus affected, in Case such Accumulation cannot in Time be broke away; and in Case it can be wore away, yet during its Continuation, that Part will be Paralytick. In this Circumstance, if a Nerve be so affected, that its proper Fluid cannot undulate through it as naturally, there will be a Palsie with a Deprivation of Sense; as it is manifest from the known Laws of Sensation, must arise from Compression only.

Spott.

Further, in Case this *Lentor* happens to ferment in any Part of the Body, and by that Means becomes more fluid, insomuch that by a continued Compressure it can escape the Vessels as far as the Surface of the whole, or the Superficies of the *Viscera*, or can breathe quite through by Sweat; or if some Parts of this *Lentor* can in like Manner break through without Fermentation, so that being arrived at the superficial Mem-

Membranes, either between the Skin and Cuticle, or between the fine Coats of the Cuticle it self, it there becomes of such a Nature, that without the Help of any Fermentation there also its most thin and liquid Parts can perspire, leaving the more hard and less moveable behind; and if the Parts thus escaping be so small in Quantity, that they cannot raise a Tumour, but yet are capable of tinging the Parts where they lodge with a Colour, then Spots will be generated, either on the Surface of the Body, or upon the *Viscera*; the like to which would also happen if the Matter thus escaping, and distilling into the Interstices of the Membranes, had not mixed with it any thin or liquid Parts, but consisted only of such as are hard and fixed. But if this Matter, when thus circumstanced, is capable of Fermentation, and Confinement at the same Time within the Interstices where it lodges without Perspiration, so that it requires more Space when it so ferments, it will then lift up the Part into a Tumour, or a Pustule, differently coloured, as the generating Matter was disposed in it self to this or that Colour, when it came originally into those Interstices, or whether it obtains them by its Fermentation. Yet these Pustules might be produced without any further

T

Fer-

Fermentation, if the Matter thus insinuating into the Interstices of the Membranes be continually accumulated in Quantity, so that by its Increase only it requires more Room for its Reception and Lodgment.

Cold Sweat.

Lastly, If this *Lentor* be of such a Nature, that by a farther Compressure from the affluent Blood, or by any Solution which it endeavours to obtain in such a State of Compressure, its Parts become so disposed as to ouze through a Kind of *Ichor*, that is, a most thin Humour, through the Glands of the Skin, after the Manner of Sweat, or through the Pores like Perspiration, without any glandular Secretion, and this in Consistence and Transparency like to Sweat, the Part through whose Pores such Humour escapes will be said to sweat; and where this *Lentor* happens universally to the whole Body, which is likewise possible, the whole Body then will be in a cold Sweat, even in the Time of the cold Fit. But this will the more easily happen to be the Case, where the Constitution is very scorbutick, or over-run with cutaneous Foulnesses, or any other Disease of that Kind that is attended with a Salt Disposition of Blood; for Salt is more efficacious in fusing the Humours the same Time

Time that it gives a Perception of Cold with greater Intenseness.

It is likewise manifest, that when the Constitution is thus clogged with a Lensor, and the Blood affected, as above explained, a natural Nourishment will not at the same Time subsist in the Vessels, nor can it be again repaired in these Disorders, whereupon must of Necessity ensue a Privation of Nourishment; but it does not therefore follow that there will arise a Sense of Hunger, although Nourishment is not only wanting, but also somewhat is continually, through this whole State of Distemperature, wasting from the Body, which otherwise would not be consumed, and which if consumed in a natural State, would be followed by a Sense of Hunger; for as by the Strength of the Disease only, we know the Debility of the Constitution, this Debility, which would otherwise be the Consequences of Hunger, is not placed to the Account of a Want in Nourishment, but to the Violence of the Disease; for in this Circumstance there is wanting that gnawing Sensation at Stomach, which we by Experience learn to be the Attendant of true Hunger, wherefore we are certain the one is not given, where the other is not also given. In the Condition therefore as here put, the Body

is after a certain Manner exhausted, and it is also attended with a Debility, which ought to be the Effect only of such Exhaustion, although it might be supposed that from these should arise exactly the same Sensation as that which happens through the whole Body in a natural State; but because this is not joined with that Sense at Stomach, which by Experience we know to be the Constituent of true Hunger, there must be a Privation of Nourishment through the whole Body, without such a Sense of Hunger. Nor does it seem reasonable to be admitted, that the Sensation which arises from Exhaustion in a cold Fit, should be in every Respect the same as that which proceeds from natural Hunger; because as the Conditions both of the Juices and Solids are in these Circumstances widely different, it is not possible that the same Sensations should result from both: And thus much may suffice for what happens to the Patient during the cold Fit.

The Concomitants of
Heat.
A Delirium.

In the hot Fit does easily come on a *Delirium*, either from too much Dryness, or too much Heat; and intense Heat will dry away the proper Moistures, so that the whole Mass of Blood will be rendred dryer, whether the *Lentor* producing this Effect had in its Composition

fiction any Humidity, or not; in this State then all the remaining Humidities are wasted, and the Nerves dried so much, that they cannot obey the Motions of any sensible Species, nor undulate in Conformity to their Impressions, without the Influence of some Power greater than is given by the Motions of some Species; therefore the Nerves will fall into Tremors, by yielding to some Impressions, and not to others, in such uncertain Order and Measure, that Images will be falsely represented to the *Sensorium*, and a *Delirium* produced. But if this highest Degree of Dryness does not happen; yet by Means of the Heat the Spirits will be too much dissipated, and undulate the Nerves irregularly; that is, they will excite this or that Species without any Order or Connexion, and produce a confused Representation of Images, which is a *Delirium*.

On both these Accounts will be produced very obstinate and continual Watchings; for that Dryness of the Blood which is produced by too much Heat, and maintained by the same Cause, will allow no Humidity to be supplied to the Nerves and other solid Parts, whereby to moisten them, and render them fit for Motion; nor will it allow any Moisture to be supplied to the Spirits, whence

they become more rigid and active, that is, they more violently agitate the Muscles and Fibres than is consistent with that Composure as is requisite to sleep.

But in this hot Condition there may be given such Requisites as will put on the Resemblance of Sleep, that is, as will keep the Patient without Sense and Motion; and this will happen if the Heat is accompanied with a *Lentor*, as often as such *Lentor* shall obstruct the Capillaries in the Brain, in such Manner that the Blood cannot reach to those Glands which are destined for the Secretion of Spirits; or if thereby the Arteries are so crowded and pressed externally, that although the Blood can flow through them, yet the Brain is so compressed by such an Extension, that both the Generation of Spirits, and their Motion into the Nerves, cannot be accomplished. And suppose the Heat should abound in the Head without any *Lentor* there accumulated, when the Heat hath arrived to such a Degree, as will attenuate the Blood enough to transpire from it whatsoever is suited for the Excitation of Sense and Motion, whether such Transpiration be insensibly without any Effort of Nature, or whether such Parts perspire after the Excitation of muscular Motion, and undulations

tions in the Nerves, the Body will afterward be left altogether inactive, and without Sense, so as in Appearance to be in quiet Sleep: For both the Pulse and Respiration will be entirely composed by Means of a weakened Energy of Spirits, reduced also to be small in Quantity; and the Patient for the same Reason will be without Restlessness or Perturbations, or any Kinds of a *Delirium*. But there may be occasioned sometimes Concussions or Startings between whiles; that is, where, by a diminished Quantity of Spirits, that Resistance from the Constriction of the Nerves cannot be overcome, so that a long Time is to be expected before they can fill the muscular Fibres; and when they are sharp and precipitate in their Effusion, they will suddenly and strongly contract the Muscles; which Extremes happening in these or those Nerves without Regularity, this sudden and violent Contraction will happen in these or those Muscles without any certain Measure, whence consequently must proceed Concussions and Tremors upon the Parts, or of the whole Body.

Suppose also by this Excess of Heat, ^{A Stupor of} the Spirits, or the Matter from whence ^{the Body.} they are generated, to be so far consumed, that they are not sufficient to assist in the Operations of the Mind, the

Mind will be stupified; but if there be so much in Quantity as to suffice for the Repletion of the sensory Nerves, and to excite a gentle Undulation to the Brain upon the Impressions of external Objects, the external Sensation will go on regularly. But if there be a Quantity of Spirits sufficient for the Operations of the Mind, but a Heat at the same Time that waists them too much in the small Fibres, such as are all the Nerves conveying back Impressions to the Brain, or occasions a continual Perspiration of them, then there will be a right Disposition of Mind, with a Distemperature of external Sensation.

A Palsie.

By this Dryness and Perspiration of Spirits, any partial or general *Paralysis* may be occasioned, either perfect or imperfect; and first of all when a Nerve, or an Artery, or both, communicating Sense or Motion, or both, to any Muscle, is dried or rendred crisp, or when the Spirits are exhaled before they enter into the muscular Fibres; and such a Part will remain in Inactivity as long as these Instruments are so disordered; but an universal Palsie follows when this happens to the whole nervous System.

Pains of the Head.

A pungent Pain in the Head will ensue from a Solution of the Blood by its

its Heat into such Parts as are very active and penetrating; a throbbing Pain, because the Blood, greatly rarified by Heat, takes up more Room in the Arteries, and thrusts them with a greater *Impetus* outwards, whence their Membranes or Coats are violently distracted, and a Pain with Throbbing; which also will be accompanied with Tension, from the same distractile Force; and if to these be joined an Accumulation of *Lentor*, there will be a Weight too felt in the Head at the same Time. But if there is not given a Plenty of Spirits keeping the Brain in its due Tension, by that Distraction of its Membranes and Fibres, so that they fill, and reach into Contact with one another, there will be a Perception of those Affections, as we feel in those Parts which are hollow or empty, and we shall seem to have a Lightness or Emptiness in the Head.

From the same Excess of Heat easily proceeds a Phrensie; for as the Blood rarifies by such Heat, therefore it is forced to make some Stop in the Straitnesses of the capillary Arteries, and some Parts of it stay behind, while others which are more subtle get through, whence a greater Quantity of that which is less fluxile will there accumulate, and distend the Arteries beyond their

their natural Dimensions, while the Parts which are less fluxile, by Means of their included Heat, will produce Inflammations; which will also the more readily happen, if such Heat is accompanied with a *Lentor*, as before explained.

Hemorrhages. From this very Rarification of Blood, may happen an Hemorrhage in any Part; for when it accumulates in the capillary Arteries of any Part, and exerts a greater *Nisus* than natural against either of those, or the next Ramifications, it will make its Impressions most upon the weakest Parts, so that the Blood will break through, that is, there will be an Hemorrhage.

Thirst and Dryness.

But as this Heat attenuates and evaporates the aqueous Humidity, so that the Blood is deprived of that Matter, which should go into Spittle, and moisten all the Parts of the Body; whence will arise Thirst about the Mouth, and a Dryness all over the Body, with a burning Heat from the Fever; and which Heat will be most intense in the Parts most dried by the Fever: But if the Heat does not wholly waste the Humidities, there will be a Spittle generated in the salival Glands more viscid than natural, which in such a Circumstance being derived into the Mouth, will hang about it somewhat like a Liquid, and be differently coloured,

ed, in Proportion to the Share of Humidity retained in it, and the Activity of the Heat modifying various Appearances, all different from what is natural. But because upon the Superficies of the Tongue does arise many *Papillæ*, separating a *Mucus* that covers it, the igneous and dry Particles which exhale from the *Oesophagus*, or *Aspera Arteria*, or through their own Ducts, with all the Steams from the Breast and *Abdomen* coming up that Way, will be entangled therein; which cannot but occasion the Surface of the Tongue to be extremely dry, insomuch as greatly to contract the Fibres constituting its exterior Coats; and since the contained Parts of the Tongue will not give Way, in Proportion to such violent Contraction of the Surface, it must necessarily happen that the exterior Membranes must be divided this and that Way, so as to leave great Fissures and Chops between them; and differently coloured also, for the Reasons above: And further, from this very Cause of Heat and Dryness, a Person may lose the Faculty of his Speech, without losing his Understanding, or Perception of external Objects; that is, he is under a Disability to contract and exercise those Parts, through their Excess of Dryness, which

*Clamminess
in the Mouth,*

*and Loss of
Speech.*

are requisite for the Articulation of the Voice.

*What Per-
ception in the
Back.*

There is nothing happens remarkable in the Spine from such a hot Fit as comes on of it self without any foregoing Cold; but when a hot Fit comes after a cold one, it may retain along with it the persevering Cause of Cold, in the Manner above explained; and in Conjunction with this Cold we are accustomed to complain of a Pain in the Loins, as if they were actually dividing, and it is out of our Power even to sustain or support our selves: The whole Property of this *Lentor*, when it obstructs the Vessels in the Interstices of the Bones being such, as will have the same Effects, and produce the same Sense of Pain, as have been explained in the preceding *Propositions*, and which the *Greeks* call *ἰσχυρὸν*, arising from no other Cause than a Pressure of the *Lentor*, bearing against the Sides of the Bones with an unusual *Momentum*, or thrusting against them, in a Manner that is very unnatural.

*An intermit-
ting Pulse.*

An intermitting Pulse will follow from an Intermission in the Motion of the Heart, and the Heat will intermit in its Motion from the same Causes, and after the same Manner as we have just now demonstrated a *Pal-
sie* to proceed from Excess of Heat;
to

to which may be here added, that this may also happen from a Poverty of Spirits, when they are exhaled by too much Heat, so as not to fill the nervous Cells in due Space of time, but require a much longer for their Accumulation in Quantity sufficient for the natural Functions: The same may be said concerning the Blood exceeding in the like Properties, and causing too much Contraction. The rest of those Affections, which we have observed to happen from Cold, may likewise here ensue, as will easily appear to any one who attends to what hath been taken notice of already to proceed from Heat; to which also may be added a Cough, from sharp Particles put into Solution, and stimulating the Breasts, or from an Inflammation having the same Effect.

But because from the Heat of the Blood, its Motion both through the Arteries and Veins is made quicker; *The Bile separated thinner and sharper.* those Juices therefore which are most viscid, and on that Account require a slower Velocity of Blood for their lateral Secession into their Secretory Glands, will admit only of their most thin Parts to be secerned, that is, such only as can secern in such a Velocity, and recede into their lateral Ducts: Wherefore in the Liver,

Liver, wherein Bile, the most viscid Juice is separated, what of that Juice in this Circumstance is secerned will be more fluxile, and composed of its most moveable Parts; that is, it will be thinner and sharper, but it cannot be determined what Quantity of this thinner and sharper Bile shall be separated; for by Means of an augmented Velocity of Blood, a greater Quantity of it will flow through the Liver in any given Space of Time, than flows thro' the same *Viscus* in the same Space of Time with a natural Velocity; from whence it may happen for a greater Quantity of Bile to separate from an augmented Quantity of Blood; but because the Velocity may be an Obstruction to this Secretion, it may be so circumstanced as to make it more or less, as such Velocity is accompanied with a Disposition of Blood, that will with more Ease or Difficulty part with its Bile; and how far, or to what Measure of Consistence in the Blood this Heat is able to bring it, cannot with any Certainty be determined. The same is likewise applicable to all the other most viscid Humours which are separated in the *Viscera* or Glands of the *Abdomen*, or throughout the whole Body.

But,

But, on the contrary, as the Urine The Urine of various Kinds. consists for the most Part of Water, that is to say, of somewhat very fluid, but what also requires its proper Time for Secretion and Derivation; by an increased Velocity of Blood therefore the Separation even of that may be lessened, and much more consequently will the Separation of more gross Parts be retarded by the same Means, which of themselves, without the Help of an aqueous Vehicle, can never secern; and of this Vehicle they may be deprived, not only by Reason of an augmented Velocity, but also because, where the Heat is very intense, such aqueous Parts are by it attenuated and exhaled; whence there is no Urine; but if the Heat is somewhat more remiss, and the Velocity also not so great, whereby there is given some Time for the Secession of aqueous Particles, the Urine then will be made small in Quantity, and crude. But if the Velocity be further diminished, so far as to admit along with it more rigid Particles through the secretory Passages, the Urine will then become higher coloured; but because some Part of the aqueous Humidity will be exhaled by the Heat, a lesser Quantity of aqueous Parts will be found in it; and further, because such Heat cannot attenuate or exhale the rigid and gross Particles,

articles, these will yet be dissolved in a retarded Velocity, and be incorporated with such a diminished Quantity of Lymph, so as to constitute a Urine that will not be crude, but higher or lower coloured, as the Quantity of Lymph is proportioned to the Quantity of rigid Particles; and the whole will be but small, as appears from the Doctrine of Urines: And all the other Affections which we have explained to happen in the *Abdomen* from Cold, will also be the Effects of Heat, as is manifest from what hath been already said.

The same Affections as from Cold in every other Part of the Body, but uncertainly.

The same Affections will happen in every other Part of the Body as from Cold, but with great Uncertainty, as the Principles of Tumours, and Tumours themselves, and especially inflammatory ones, as hath been already demonstrated; as also Spots, Pustules, &c. even when the Heat succeeds Cold without a *Lentor*; nay, the same happens to the whole Constitution, not excepting even cold Sweats, when a *Lentor* with Heat is supposed to press through the sudoriffick Glands, whatsoever hath been separated by such Heat, which will pass them separately, and affect the Skin with a Sense of Cold and Clamminess. But many of the foregoing Symptoms will by so much the more be aggravated and fatal, when they pro-

proceed from an Heat that hath no preceding Cold, but coming on first of all by it self; because it then supposes a great Tenacity in the *Lentor*, and its firm Adhæſion to the Veſſels.

What hath hitherto been remarked, we here judge ſufficient; for the two Sources whence we have deduced all theſe diſtempered Affections, are very extenſive; and whoſoever diligently attends to this *Propoſition*, and compares it with what we have wrote concerning *particular Diſeaſes*, will find that there is no Diſtemperature which may not be attributed to one or other of theſe two Origins. And thus far we would aſſume from this whole *Propoſition*, that from it are ſuppoſed to be known, all that is commonly included under the Symptoms of Fevers; and that by this it appears that all the moſt fatal of thoſe Symptoms, which Phyſicians ordinarily aſcribe to *malignant, peſtilential, occult Qualities*, and the like, do ariſe only from more obvious Cauſes, and have in them nothing *malignant* or *occult*; but act only by more or leſs fuſing the Blood, and coagulating it into *Lentors*: which was to be demonſtrated.

PROPOSITION XXII.

The Antecedents to a continued Periodick Quotidian, may vitiate the Blood in its Motion, Quantity, or Quality: But its Concomitants and Consequences do not necessarily depend but upon its vitiated Qualities.

Antecedents,
how they operate.

Age, and a moist Constitution of Body, Climate, or Season, do dispose to, and produce cold Humours, as is in it self manifest; Suppose therefore these to be natural, they will then have no other Effect than to vitiate the Blood in Quantity, by an Increase of Phlegm or Viscidity; but from such Sort of Humours likewise arise Listlessness to Action, and a less Quantity of Spirits than natural, whereby also the Motion of the Blood will be vitiated: Yet because it cannot happen, that cold Humours should abound beyond the Measures of Nature, and the Blood at the same Time preserve it self as to its Qualities in a natural State, (since under the Appellation of Blood we understand that Fluid which

which is compounded of all the Humours which flow through the Veins and Arteries, and for the Preservation of which in a natural State there is required a determinate Measure of each) when therefore cold Humours are augmented in Quantity, the whole Composition, of which they are a Part, will, in Proportion to such Augmentation, become colder.

Because also by a plentiful Use of Milk, as in Sucking Children, a Chyle is generated more gross and cold; and for the same Reason also where Teeth are wanting, in the Use of somewhat more substantial Food, as in young Children, whereby a sufficient Communion of it is not made in the Mouth, so as to dispose it the better for Digestion in the Stomach, a Chyle is produced less concocted, or more crude, or cold; and on the same Account also is there the like Generation of a cold viscid Chyle in old Persons, who have lost their Teeth; and much the more so too in the latter, because such are supplied with Juices less active, and less suited for Solution, and their Membranes are less contractile through Dryness: These likewise can in like Manner vitiate the Blood in its Motion, Quantity, or Quality.

Persons likewise of a corpulent, and gross Habit of Body, will abound with Phlegm from the Diminution of Perspiration by Means of too much Fat, or a hard Skin; the like happens to Persons of unactive Lives, in whom the Juices are not enough broke and discharged for Want of Exercise; to Persons given to Intemperance, because they take in more than they can digest; and to too much Sleep, because that of all is the greatest State of Inactivity, and occasions too great an Accumulation of Humidity: And therefore the first Part is manifest.

How the Concomitants.

Because then a Blood made of such Humours must in it self be cold, therefore likewise it will be thick and viscid, or there will be generated in it a *Lentor*; but because this *Lentor* is from watery or phlegmy Humours, it will therefore be accompanied with somewhat that is easie to be moved and separated from its other Parts, and what will also easily admit the Disengagement of any igneous Particles that lodge therein. When such a *Lentor* as this then is brought into the capillary Arteries, it will adhere indeed to their interior Superficies, but its most liquid Parts with the Heat will be pressed out, and leave behind it what is most tenacious, and dry, and what will most strongly adhere

adhere to the Arteries; and as this most thin Part returns by the Veins, either alone, or in Conjunction with another *Lentor* of the like Kind, there will be a Return made in so much Time as is required to finish its Circuit through the refluent Veins, either by it self, or in Conjunction with a fresh generated *Lentor*, or one derived from any other Part; but as the returning *Lentor* is in this Case supposed to be more fluxile than another, and but of an aqueous Consistence, it will finish its Return in a short Time, that is, in the Space of 24 Hours; and its Accession will be without any Sense of Cold, Rigor, or Shaking, with a continued Heat from one Fit to another, which will happen every Day, as appears from the preceding *Propositions*.

The Time of its first Attack will be chiefly when the Blood is most disposed to Viscidity, that is, on a Change from a warm into a cool Air, when the Skin is constringed, and Evaporation suppressed, that is, about the Evening, whence its first Accession will be about that Time; and as the succeeding Paroxysms answer the first regularly every Day, the future Accessions will also be about the same Time: But these may also happen without the Return of the same peccant Fluid, where

Why its Accession in the Evening.

Termination
without
Sweat.

there is in Readiness such an Humour in the Blood as is disposed to pass into a *Lentor*, upon such a Constriction of the Skin as happens in the Evening. But because this more fluid Part, which is expressed from the adhering *Lentor*, recurs, there will be nothing left which can be separated from the peccant Matter, whence there will be no Sweat in the Termination, because the Humours are reduced very near to their natural Measures; but neither would there be Sweat, were the peccant Matter not thus to be reduced, if it be so attenuated by Heat, as to be rendred perspirable; but neither will the Patient sweat, although the peccant Matter is not attenuated enough for Evaporation, or returns not so viscid as before; that is, if it be so far broke as to be separable by the cutaneous Glands, but is hindred from it by some Impediment to its Derivation, into those Ducts upon the Superficies; and this Impediment may be the *Lentor* it self, which remains in the capillary Arteries, and covers the Surface, through which Sweat should pass, as it were with a Crust, so much that the Pores, which otherwise would let out Sweat, are rendred impervious. And what is here said of the Glands of the Skin, may also

also be pronounced concerning the Glands in all other Parts.

Why the Pulse is rare, flow, unequal, and less than in other *Intermittents*, and the above enumerated Fevers, abundantly appears from the foregoing *Propositions*; for the Thickness of the Blood joined with Cold, occasions a more sparing Secretion of Spirits into the Nerves, and a less Force and Energy of Motion in the Blood through the Arteries.

But because there is a greater *Momentum* required for the Secretion of gross Particles, and upon the Accession of a Fit there is the least Velocity of Blood, therefore those gross Particles which ought to be secerned with the Urine, cannot go off that Way at the Fit's Accession, but only the more watery Parts, that is, such as are secerned with a much lesser *Nisus*, whence at this Time the Urine will be crude; but upon the Rise of the Fever, the Blood's *Impetus* will be increased, or its Pressure, whence the harder or thicker Parts will be secerned, and the Urine will obtain a Consistence and Colour; and the rather, because by the feverish Heat the more humid Parts will be attenuated and exhaled: And because in this Kind of Fever a watery Humidity does more abound than in any other, it thence happens, that when the Urine is most

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heightned in Colour, yet it is less fiery and red than in other Fevers, where such aqueous Humidity is in less Quantity.

Thirst, &c.

Again, because by the Heat in the Fever some Portion of Humidity is wasted, and some Parts of the salival Ducts opening into the Mouth are furred by the *Lentor* in the capillary Arteries, therefore a less Quantity of such Moisture will be supplied to those Parts from those Ducts, whereupon they must grow dry, and be affected with a Sense of Thirst; but because the Quantity of Moisture in this Kind of Fever is greater than in any other, the Thirst also will be more remiss in this Fever than in others; unless with such Humidity be joined a Salt, which shall imbibe all its watery Parts, and grow dry upon the Membranes, for in such a Circumstance the Thirst may be greater than in any other Fever. By an Accumulation of these watery Moistures, which are as it were transparent, tinged with no Colour, and disposing the Membranes to Flaccidity, the Complexion will seem bloated, flabby, and wan: A Drowsiness will also come from the same Cause, because that is most encouraged by Moisture, and its Disposition to soak into the Interstices of any Parts. Inappetency in like Manner is

a *Concomitant* of this Distemperature, not from the watery Humours, as they are such, but from that Affection of the Stomach, and the whole Habit, which we perceive to be vastly different from what it is, when there is a craving, and a Necessity for Food, as hath been already explained in the preceding *Proposition*. Hence likewise phlegmy Stools from the Abundance of such Matter, whose thinner Parts, and those most capable of Separation in the Glands of the Intestines, will, by the Intermediation of those Glands, be brought into their Cavities, and detached away by Stool.

Because from this *Lentor* is separated what is most fluid, and that which remains is greatly tenacious; and because in such a very moist, watery Constitution, the natural Heat, as well as that of the Fever, is less vivid, and there is a feebler Contraction upon such a *Lentor* for its Removal, or Dislodgment; for all these Reasons therefore that *Lentor* which sticks to the Vessels will with greater Difficulty be broke away, to be comminuted by Circulation; whereby the Distemper will be protracted into a long Space of Time: As also will the Fever be long protracted, when it is continued by the Influx of a like Kind of *Lentor* from
Whence its
long Duration.
some

some other Parts into the Blood-Vessels; for from whensoever it comes, whether it is generated either from too remiss an Heat, or too slow a Motion in the Blood, such a *Lentor* will with Difficulty be conquered, or its Cause removed. And Experience teaches us, that a *Quotidian* will sometimes be protracted for 40, 60, or more Days.

Its Termination by Sweat.

But the *Lentor* by this Time will give Way, and be so taken up by the perfluent Stream, that by its Motion in the Blood, and Agitation in the Lungs, it will be rendred altogether fluxile, and incapable of any further Adhæſion to, or Obstruction of, the Arteries. If therefore in this State of Liquation the *Lentor* is changed into somewhat that is expreſſible by Sweat, the Fever will then terminate with Sweat; if into any Thing that is separable by the Glands of the Intestines, Pancreas, Stomach, or Liver, there will then ensue a Looseness of the Belly; if by the salival Glands, there will arise Defluxions of Spittle, and especially if it be of that Kind which is most easily separated in the *Parotides*; for then the whole Quantity of *Lentor* will be derived that Way, and lift those Glands up into a Tumour, and which Tumour, if it does not obstruct the salival Ducts, or occasion by its Pressure a Reflux of that

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Matter back again to the Generation of another *Lentor*, will prove salutary, and the Fever will terminate by Spitting; but if either of these, or both happens, it will make the Case bad.

But because whatsoever is most dry, Consequen-
compact, and unmanagible in the Blood, ces.
is yet left behind, and adheres to the Arteries, and there is an Abundance of watery Humours pressed out from such obstructing Viscidity, and which are distributed through the whole Habit; there will nothing therefore of a natural Aliment be carried to the Parts which require it, but somewhat in its Stead that is watery and fluxile, not only in it self, but disposed to make the Parts so also; wherefore they must be but ill nourished; that is, a *Cachexy* will ensue with all its customary Attendants: And hence it will happen, that all the Limbs and *Viscera* will be reduced to the utmost Imbecillity, so that they will be exposed to Suffusions of aqueous Humidities on all Sides, when they will collect either in the greater Cavities, or in the Interstices of the Membranes, whence will proceed a *Dropfy*. But this may also happen in Parts of greater Firmness, and in a lesser Accumulation of cold Humours, if so that by such a *Lentor* are generated obstinate and large Obstructions, lifting up a Part into such Tumours

mours as press upon the Lymphatick Ducts; or if it be upon the Veins in such Manner, that by their Contacts there is made such Compression against them, as to squeeze out through their Coats a Lymph, that being collected in the larger Cavities will occasion a *Dropsy*.

Lastly, If this Fever is of long Duration, and the febrile Heat hath arrived to such a Condition by its Duration, that hath absorbed or exhaled the whole Humidity, leaving only the *Lentor* behind, the whole Constitution of the Humours will in this Case be changed, and of the solid Parts too, into an hot and dry Temperament; wherefore, according to what was above proved, must ensue an *Hectick*. It is therefore manifest that the *Concomitant* and *Subsequent* Affections to a *continued Periodick Quotidian*, do necessarily depend upon a Blood so vitiated, that it becomes more viscid, or compact, the Activity of its Heat being maintain'd and augmented at the same Time, or from a vitiated Quality in the Blood; which was to be demonstrated. In the third Place therefore be it laid down, that the whole Series of Affections hitherto explained, do not necessarily depend upon a Blood vitiated in its Motion or Quantity; for the Blood being vitiated in its

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Motion or Quantity, is not the Cause of all these Appearances; nay, there is one or more of these Affections, that necessarily depends upon a *Lentor* in the Blood, and from whence, although there was no Disorder in its Quantity or Motion, all the enumerated Affections would flow; and therefore the whole Proposition is proved.

PROPOSITION XXIII.

The Fevers belonging to a continued Periodick Quotidian, and what is this very Fever.

Although it is much disputed amongst Physicians about the Essence of this Fever, yet there are not wanting some who deny even its Existence; but to avoid this Question, that is, whether there is in Fact such a Fever, or not? or can possibly happen such an one? we shall proceed to explain what is possible to happen, and thence it will appear, that a Fever may be given wherein the inner Parts are hot, and the external affected with both Heat and Cold at the same Time. And this is easie enough to happen and be conceived; for sup-^{An Epiala.} posing the Body to be affected with a
Lentor,

Lentor, that is not uniform, but different in its Composition, so that from some Parts of the same *Lentor* the Heat cannot be expressed, and that from other Parts it may be disengaged; and suppose that a *Lentor* thus circumstanced is distributed into the Arteries of the whole Body, then both Kinds will produce its proper Effect, which will be perceived in every Part where the *Lentor* adheres; and therefore where the frigoriſſick *Lentor* obstructs, there will be a Sense of Cold; and where the caloriffick, a Perception of Heat; and this will happen in every assignable Space of the Body, how small soever, as both *Lentors* are supposed to subsist in their minutest Divisions, that is, divided into their utmost Minuteness; whence it will come about that both the Patient himself, and any one who lays his Hand upon his Flesh, will perceive at the same Time both Heat and Cold interspersedly blended together upon the same Part; that is, that there is an *Epiala*, which is a Fever, wherein at the same Time the most minute Particles are in Excess of Cold and Heat, as *Galen* himself describes it.

But, Secondly, let the *Lentor* be supposed of such a gross Consistence, that it is not only unable to pass the minutest Canals of the Body, but also those
of

of much greater Capacities; the whole of that therefore, which is very gross and viscid, will be collected in the larger Arteries, from whence whatsoever Particles of a more hot and active Nature come back through the Veins with the reflux Current, will again be entangled and restrained, insomuch that it loses its Power of giving any Perception of Heat, whence the Inwards will feel cold; but then by Compressure the Heat will be again forced out of this *Lentor*, and carried to the capillary Arteries, or the external Parts of the Body, whence they will grow warm; and what thence gets through, and is again conveyed into the larger Trunks, will again be entangled in the old *Lentor*, insomuch that it cannot any more than before excite any Perception of Heat in those greater Vessels; from whence there will result a Fever, when through its whole Circuit the internal Parts will be cold, and the external hot; and which Kind of *Epiala* is described by *Avicen* and the *Arabians*. But whether this Kind of Fever is reducible only to a *continued Quotidian*, is to be determined by its Periods, nor is it any great Matter to what Class it is most reducible.

Because in this Fever there is supposed a great Quantity of phlegmatick and crude Humours, there must therefore be

*An humoral
Syncopalis.*
pro-

produced a very considerable *Lentor* from such a cold and watery Disposition; wherefore in the Accession chiefly of this Fever, that is, in the first Accumulation of its *Lentor* in the capillary Arteries, the Juices may be separated in those Glands to which they circulate, before they are too much obstructed, after the same Manner as in a natural State, only somewhat more viscid: But these, by Means of their *Lentor*, will occasion uneasy Sensations, and such strong Efforts upon the Nerves, where they happen to be derived in Cavities where they are plentifully dispersed, as will waste a great deal of their Spirits; and this will also the more easily be affected at a Time when the Spirits which are separated in the Brain are both fewer in Quantity and more watery, or less fit for the Discharge of the natural Functions; in which Case, any strong Undulations will make great waste of them, insomuch as to impair the Strength, and reduce a Person to a State of Listlessness; and in this Case a sudden Pain will happen in the Part whereinto such viscid Juice is drained before the Strength decays, and any thing of such a Derivation is perceived.

Since therefore the inner Coats of the Stomach is covered with Glands, wherein a certain Humour is secreted,
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in the Accession of this Sort of Fever there will be generated a viscid Juice, which will be drained into the Stomach; and there adhering to its Coats, with a Motion sensibly insinuating into, and distracting them, there will be produced a girding Sort of Pain with great Uneasiness; and this Sensation may make such vivid Undulations of the Fibres, as in a Scarcity and Poverty of Spirits will in a little Time quite disable them from Motion; that is, there will be a *Syncope*: And the more strong will such Vibrations be, although the Sensation is not so great, because the Nerves distributed to the Mouth of the Stomach are very considerable, and make very great Re-undulations into the adjoining Parts, so as to produce the highest Degree of *Impetus* where their Concourse is greatest. But a *Syncope* may also happen where the Reflex is not suddenly communicated with so considerable a Concussion and Agitation of Spirits as immediately dissipates them; and that is when such Reflex extends to the Cardiac Nerves, which communicate with those of the Stomach, and the Motion of the Heart is thereby so much quickned, that between every Contraction there is not Time enough allowed for the Blood to fill the Auricles and Ventricles, on which Account there

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will be neither Pulse, nor Secretion of Spirits, nor any Derivation of them, which are already generated into the Nerves, and Muscles, and Instruments of Sensation and Motion; for the Blood will not be circulated into the Arteries of the *Pia Mater*, which by their Dilation are to compress the Brain, and squeeze out its Contents, and the Blood is the Promptuary, whence the Spirits are elaborated; and therefore in these Circumstances will there be a Decay of Strength, and this perhaps is the most common Way of producing a *Syncope* at Stomach in this Kind of Fever. Here then must ensue an Imbecillity of the Body, and a slow and weak Pulse; but when so much Blood can be accumulated as to overcome that additional Force of Contraction in the Arteries, then the Pulse will be somewhat more full; and as some Spirits will from thence be fecerned, it will grow also stronger; but this Tenour will be very inconstant and uncertain, unless the same Sensation of Pain continues, and much the more when such Sensation is not uniform, as the refluent Undulations which occasion it are in themselves unequal.

The *lesser Syncope* hath in it nothing peculiar that requires any separate Explication; for whatsoever happens in that

that comes from a Sense of Pain in the Stomach, not excited by thick and viscid Humours, but from such as are small in Quantity, thin, sharp, and ichorous; which is sufficient for the Effect, without any Help from a Poison or Venom, when it is more especially very active and stimulating. Whether both these Kinds of a Fever are reducible likewise to a *Quotidian*, we shall not dispute, because it is of no great Moment to the Knowledge of Diseases. They who would be informed of all that belongs to a *Syncope* in general, further than what concerns that which affects the Stomach only, may consult our Discourses concerning the *Diseases of the Breast*.

A continued Periodick *Quotidian* is therefore a Fever, consisting in a Fault of the Blood in Quality, wherein it becomes less fluxile, by Means of a *Lentor* which recurs every Day, leaving always behind it its more dry Parts in the capillary Arteries, while the thinner Parts flow through; or where the thinner Parts waft by Perspiration, a *Lentor* of like Kind may be supplied to that Portion which remains in the Capillaries, from some of the *Viscera* every Day, which shall also after a Fit leave some of its dryest Parts behind in the same Capillaries; and this will be the Case every

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Day

Day as long as a Person is said to labour with this Fever; wherefore the whole *Proposition* must be true.

PROPOSITION XXIV.

The Antecedents to a continued Periodick Tertian may vitiate the Blood in Motion, Quantity, or Quality; but its Concomitants and Consequences do necessarily flow only from its vitiated Qualities.

How its Antecedents operate.

It is manifest that Excess of Bile, a hot and dry Temperament, either of some particular Part, or of the whole Body, must be accompanied with an extraordinary Heat, from whence the Spirits fecerned into the Nerves will be more sharp, and the Blood be vitiated in its Motion; The Quantity of Blood will also in this Circumstance be vitiated, for whatsoever is of a watery Nature, or ought to be so, will be evaporated; so that the whole which ought to circulate through the Vessels will be lessened by so much, as its aqueous Humidity, in a natural State, added to it: The Blood likewise will be disordered in its Qualities, because by its greater

greater Agitation from an additional Heat, it will become more sharp, active, and dry, inasmuch as its more humid Parts are lost. And these Consequences will not only be brought about by a hot and dry Diet, and in the Time of Youth, but also from Fasting, and too sparing a Nourishment; for Fasting occasions the Humidities to be both spent for the Recruits of the Parts exhausted, and by Watching, which we are most subject to under such Uneasiness, for in that State there is more Agitation, and a greater Consumption of dissipable Juices; and a sparing Nourishment is only a Progress towards, or a Beginning of Fasting. This is also the Effect of frequent and violent Exercise; for in that State, by the same Means, is the Body drained of its due Moistures, inso-much that the Remainder is more dry, and the Heat made more intense; the like from Heat of Air, whether from the Season of the Year, or immediately from the Sun's Influence, or Bathing, &c. Suppression of bilious Evacuations, too much Watching, Trouble of Mind, and the like.

Since then the aqueous Humidities are drawn off by the Causes which after this Manner bring on a Fever, and whereby the Blood is rendered very fluxile, and its Heat sharp and vivid,

*How the Con-
comitants.*

after such Humidity is quite spent, the whole Mass will grow less fit for Motion, and more viscid, with a further Increase of Heat, or a *Lentor* will be produced of considerable Moment, and by Means of its Dryness, and containing but a very small Portion of Humidity, extremely adhesive; but yet such as will admit its igneous and fluid Particles, upon certain Conditions, to get at Liberty. This *Lentor* therefore will be more tenacious than that which produces a *continued Quotidian*; when therefore it arrives at the capillary Arteries, its most viscid Parts will adhere to their Coats, while the hot and fluxile Particles make their Escape from it; but as these more liquid Particles, which are expressed from a *Lentor*, are more tough and dry than that which produces a *Quotidian*, these will in like Manner be more viscid than those which are expressed from *that*, wherefore they will flow through the Veins more slowly; whence they will not again be brought back to accumulate in the capillary Arteries every Day, but every other Day, or there will be a Return every third Day; and as the most tenacious Parts of the *Lentor*, and that which is most dry, yet adheres in the Arteries, the Heat will be so long continued. The same also will happen, when to that dried *Lentor* which

which adheres in the Arteries, there is not a like *Lentor* supplied from the Veins, but from some of the *Viscera*, or any other Part of the Body; the Accessions will therefore be without Cold, or Shaking, as appears from what hath been in general premised in the foregoing *Propositions*.

Further, the Terminations will be without any Sweat, in the same Manner, and for the same Reasons, as explained in the preceding, unless when in a *Tertian* the generating Causes are such as waste the Humidities, even from the venal Blood, and the cutaneous Glands lye so open, that the thicker or most viscid Parts of such aqueous Moistures can transpire through them.

The Differences of Pulses may be also understood from the same general *Propositions*.

When therefore the Heat is thus defrauded of Moisture, whereby its greater Activity and Force should be restrained and mitigated, its *Momentum* will be very considerable, whence it will excite a very intense Perception, such as is discernable in the kindling of dry Wood, when all its Moisture is dissipated, and therefore such Heat will be burning, and very penetrating to the Touch, because it evaporates without any Contemperation from Moisture; wherein it differs

from the Heat of a *Quotidian*, which at the first Feeling is moderate, as it rises mixed with aqueous Particles, by which its Sharpness is mitigated; nor does it increase in Activity, unless by a Continuance of the Hand upon the Patient for so long a Time that the Particles of Heat accumulate under the Touch, which Circumstance we have omitted in our Description of that Fever.

In this Case Sleep is disturbed and but little, because there is but little Humidity left in the Body, although in other Respects there were less Action and Motion; for in this Condition of Blood there is not only a Diminution of Moisture, but an Augmentation of Heat; in this State therefore, that is, in a *Tertian*, there will be Restlessness, and interrupted Sleeps. And in such Sleep as this, Dreams are easily excited, wherein the Imagination is greatly agitated by the increased *Impetus* of hot and dry Spirits in the Nerves; which as they are such also as excite Rage, such Dreams will be full of Starts and Anger. *Deliria* arise from the Force of the Spirits breaking out on all Sides without any Regularity, and exciting this or that Species, as they chance to vibrate the Fibres in this or that Part; and as these too must dry the Nerves on that Account,

Account, they will fall into Tremors, and be more susceptible of Impressions from such Species as are excited in them, and there will be false Appearances of Images; that is, there will be a *Delirium*.

Upon such a Consumption of Humidity also there will be a Scarcity secreted by the salival Glands; and as the Spittle is in its self a viscid Juice, when its aqueous Parts, which should render it fluxile, are wasted, there will either little or none be separated, or it cannot flow through its proper Ducts, or the Apertures of the secreting Glands leading into those Ducts will be obstructed by the *Lentor* flowing in the Arteries, or all these may happen together, whence there must arise a great Thirst, and a scorching Heat in the Mouth, because the igneous Particles in this Circumstance act upon a Body destitute of Moisture; nor will this Thirst be perceived only about the Mouth and Jaws, but there will be a Dryness throughout the whole Body accompanied with intense Heat. From the Consumption of this Humidity, which should moisten all the Membranes, and a Want of due *Saliva* in the Mouth, the Tongue must necessarily grow dry and black, either from a dry and stagnant Blood in the Capillaries

pillaries of that Part, which at length, as in a Flea-bite, turns into Blackness, or from a Tincture of Bile, which filters up from the Stomach along the Coats of the OEsophagus, and tinges the Tongue with that Hue, and which, although it is not black in the Stomach, yet when dried upon the Tongue, and accumulated there in some Quantity, it will change into Blackness; and that this must be the Case, is necessarily evinced by the Bitterness in the Mouth, which is an irrefragable Argument of the Existence of Bile at Stomach; and the Causes of a *Tertian*, all favour the Generation of Bile, which therefore in this Fever will accumulate in Quantity, as appears by the enumerated Symptoms.

Because likewise in this State of the Blood a great deal of its natural Humidities are exhaled, therefore the grosser Particles will have greater Difficulty of Circulation along with it: And thus at the Accession of the Fever, wherein the compressive Powers are least, such Particles will be but little discerned, because in such a Circumstance the more aqueous and fluid will pass the Strainers, and leave the grosser behind in Complication with the remaining Blood, and still less fluxile by the Loss of that aqueous Vehicle that should

should keep such Parts from Cohesion and Contact: But by the Succession of an augmented Heat, the contractile Motion will be increased, whereupon those Particles that were before most unfit for Motion will be separated, and derived into the Ureters and Bladder; and as they are then in an over Proportion to the watry Parts in the Urine, they will raise its Colour, and make it look inflamed and red; by reason of an aggravated Heat also in all the Humours, the Urine will be sharp, hot, and pricking; which Perception likewise will arise from the Asperities of earthy and saline Particles, for they being then less covered by a Mixture of Humidity, will more sensibly velligate, and prick the Membranes in their Passage.

Why a Loathing at Stomach, with bilious Vomitings and Stools, are the Attendants of this Fever, may easily be conceived from the foregoing Propositions.

But great Restlessness will also happen in this Fever, because therein the Blood falls into the highest Rarefaction, and a great Energy of Heat, so that after it hath finished many Circuits, the whole Mass will be broke into Parts that are dry and fixed, and into such as are hot and active; so that it will in a Manner

Manner boil, and that with a great *Impetus*, on all sides, especially in the larger Vessels, in which it is immediately received from the Heart with Force, as in the Trunks of the *Aorta*, and the pulmonary Artery; whence the Lungs will suddenly take it in, and force it out again with such an *Impetus* and Rarefaction, as is easily conceived to happen in a Fluid thus circumstanced: On this Account the Patient will on purpose quicken his Respiration, partly from Pain, in order to throw off the offending Cause, and partly by Means of Dryness in the Lungs, which cannot contract and expand, so much as a more deliberate Respiration does require, and partly also from the Heat's acting as a *Stimulus* upon the intercostal Muscles, and partly from an Acrimony of the Spirits in general, which will occasion a more uncertain and a more frequent Contraction without any Directions from the Will, in whatsoever Part of the Body they happen to meet with a sharp hot Blood, and consequently be the Cause of Restlessness when we heed not our Actions, or sometimes strive to restrain them.

And Consequences.

But by this Time let us suppose the *Lentor* which adheres to the Arteries to be so pliable in its Consistence as to admit

admit of its Separation therefrom, although it cannot be quite dissolved, or reduced to Fluidity; it will therefore be less dry, though it will not always happen to be fluid enough to pass into the Veins, sooner than every Day, or every other Day; but if this Abster-tion gradually goes on, when a lesser *Lentor*, thus broke away, cannot get back into the Veins unless every third Day, a *Lentor*, much more difficult of Motion, although moistened enough to be washed off the Coats of the Vessels, and carried away in the Stream, will more slowly move along the Superficies of the Veins, or return into the Arteries but every fourth Day; in the subsequent Circuits therefore no Blood will obstruct in the Arteries, wherefrom Heat may continually be loosened and put into Action; whence after it hath passed out of the Arteries into the Veins, the Fever will cease, and the Patient remain well so long as it ceases to reaccumulate in the Arteries, or there will succeed an *intermitting Quartan*. And because Autumn hath a share of Cold, if not also of Moisture, on the Approach of that therefore the Heat of the Fits will mitigate, when the Quantity of Humidity is not increased; and the Patient will not any longer be so much dried even with an

an internal Heat, upon a Defect of that in the Air; because the Humidities which are taken in will stay longer in the Body, so as by Degrees to soften that dried *Lentor*, whence an *intermitting Quartan* will succeed a *continued periodick Tertian*, especially if it be in Autumn. It does therefore appear that all the *Concomitants* and *Consequences* do necessarily depend upon a vitiated Quality of the Blood. In the Third Place therefore it is alleged, that the whole enumerated Series of Affections here explained do not necessarily depend upon a Blood vitiated in Motion and Quantity, and which is demonstrable after the same Manner as in the *Twenty second Proposition*. And therefore the Whole of this is true.

PROPOSITION XXV.

The Fevers belonging to a continued Periodick Tertian, and what that it self is.

A Causus. Since we treated particularly about a *Causus* before, and singly explained its Affections, we have nothing here further to examine besides its Period, which

which is to be fetched from the same Cause as the Periods of a *Tertian* already explained; that is, when a *Causus* is not with a perpetual and equable Heat, and without Exacerbations, but with Exacerbations, and having its Accessions, Augmentations, Height, and Terminations, under the same Conditions of that. When therefore a *Causus* hath the same Types, or Periods, with a *continued Periodick Tertian*, it is in it self nothing else than a *continued Periodick Tertian* more aggravated.

Suppose this *Lentor* to be so obstinate ^{A Colligens} and dry, that its whole Heat be compressed out of it, and whatsoever it had ^{quans.} acrimonious in its Composition, so that together they get Liberty, and take their Course through the Blood-Vessels; when therefore they are brought into Contact with any of the solid Parts, they will not only be unfit to nourish and recruit them, but, on the contrary, as they are destitute of an agglutinating Moisture, which should fix, retund, and contemper their eroding, dissolving, and active Qualities, they will endeavour to separate them in their natural Contextures; and as they have a great *Impetus*, they will shake and separate them from their Contacts; that is, they will dissolve the Texture of their Parts; from whence those Particles in Solution, and floating with

with the Blood in its Vessels, will arrive at the secretory Glands, and be secreted in such of them as are fitted for the Separation of natural Humours of like Textures and Fluidities.

Because therefore by such a Blood as this, the Body is not only not nourished, but, on the contrary, wore away and consumed, there will ensue a sudden Emaciation or Leanness; and as every Part suffers in such a Waste, that which is naturally required to fill up the Cavity of the Eyes will lose of its Quantity, and consequently will they shrink in their Sockets; and as they are tied mostly backwards, will they draw inwards, and leave a ghastly Hollowiness in their Appearance. The Temples will likewise fall; that is, the temporal Muscles will shrink closer to the Bones to which they are fixed, and there will be in Reality a Waste of their Substance. From the same Reason does the Nose grow sharp; for so long as the Interstices of the cartilaginous Parts are filled with proper Substance, and the Cartilages themselves are thicker, that Angle which is made by the Tip of the Nose with its *Ala* or Wings will be greater, or less acute; but when such Substance is wore away, or dried, or consumed in any Respect, the Nose will seem to shrink into it self, and become
very

very sharp at the Tip. But very great Emaciations of this Nature may happen to the whole Body, without any manifest Consumption by any of the sensible Evacuations; that is, when the Matter wore off from the Substance of the Parts is of that Kind, as will admit of Evaporation by insensible Steams through the Surface, without any glandular Secretion through the Membranes, and visible Appearances of Loss. If this deterged Substance should indeed be changed into such a Nature, as would fit it for Separation in the Kidneys, it would then go off chiefly by Urine; if in the Glands of the Skin, by Sweat; if in the Glands of the Intestines, or Stomach, or Pancreas, by Stools; discovering the Contents of the Glands that most supplied them, if in the Liver, by Stools that are very bilious, and wholly so where that alone is affected; but where there is a Mixture from other *Viscera*, there will be a Composition of all. The Stools will be frothy, by the Activity of the igneous Particles, and other Particles that are very light, which breaking forth suddenly and with Force, lift what they are entangled with up into Bubbles: They will be differently coloured according to the Diversities of the Matter supplying them; they will be greasy from the Solution of Fat; viscid and
Y bulky,

bulky, from the Solution of more solid and gross Parts; and fetid from the Mixture of Particles extremely active, and striking the Membranes of the Nostrils with great Force. And in this Sort of Fever not only one or another of these Affections will happen, but many, or all of them, in the same, or different Days; nay possibly in the same Hour, as this or that Part is dissolved, and runs into a Matter of this or that Kind, suited for Separation by Stool, by Urine, by Sweat, or by insensible Transpiration.

The Elodes.

To this *colliquative* Fever is reducible the *Elodes*, or sweating Fever, wherein there is great Profusion of it continually; and this Kind is either milder, and capable of fusing only what remains in the Parts of a watery Nature; or if it is of long Duration it becomes fatal, as it runs also those Salts which make great Part of the Sweat, and dissolves the most intimate Cohæsions and Compage of the solid Parts: And both these Kinds may come from a Ferment that has a Faculty of fusing and melting, and which is in it self very subtle; nay, in this colliquative Disposition it is difficult to admit Heat, and other very active Particles, as the sole Causes of dissolving the most solid Parts of the Body, and not that dry *Lentor* which adheres to the

the Arteries; and the Fusion of which *Lentor*, if it succeeds, will be as a colliquative Ferment it self in the Blood, and from thence this very Kind of Fever may arise, as it hath been made appear in the general *Propositions*.

Lastly, As the *Affodes* produces a *And Affodes* great and frequent Restlessness and Tossing about, that happens from the Sense of Heat, which makes the Patient covet a fresh cold Place in the Bed to mitigate it, or from a *Lentor* adhering in the Arteries, which hath some other Perception, or Sensation of Uneasiness joined along with it, or an intolerable Heat. But whence the Loathing, Vomiting, Gnawing, and Irritation at Stomach, and its neighbouring Membranes, &c. may be understood from the foregoing *Propositions*.

A continued Periodick Tertian then is a Fault in the Blood's Qualities, wherein, by Means of a certain *Lentor*, the Blood is rendred less fluxile, whose more viscid Parts remain in the Arteries, whilst its more fluid pass through into the Veins, finishing its Circuit to the Capillaries again every third Day; or where it is wasted and perspired in the Fit, it is supplied again from some Part of the Body in like Manner every third Day, as it hath been before said of a *Quotidian*, changing only the Order of Time,

wherein the Returns happen; from every Day into every other Day. And therefore the whole *Proposition* stands demonstrated.

PROPOSITION XXVI.

The Antecedents to a continued Periodick Quartan may vitiate the Motion, Quantity, or Quality of the Blood; but its Concomitants and Consequences do necessarily depend upon its vitiated Quality; and what this Fever is.

How its Antecedents operate.

A dry and lean Habit of Body is a certain Argument of dry Humours, that are destitute of Moisture and Softness, because it is that which lubricates the Parts, and fills them with Fat: A dusky and obscure Complexion denotes the same Qualities, since all Transparency is thereby lost, and such a Condensation obtained as is the Consequence of dry and earthy Particles, both which are attended with Dryness and Coldness together. And these Qualities will yet become the more remarkable from a cold and dry Temperament jointly, whereby a Blood is generated abounding

ing with the same Qualities; the like also from a declining Age, because then the Body grows dry and cold; in like Manner Autumn inclines to the same, when it is of the same Constitution in Qualities, or although it be partly cold and dry, partly cold and moist, and again cold and dry, or hot and dry, or hot and moist; for from any of these Inequalities of Constitution it comes about that the Heat or Dryness happening upon Moisture will necessarily make some Waste of it. Much Care and Anxiety also affects the Blood after the same Manner; for by such Agitations of Mind, there is not only a Waste made of the natural Moistures, but less Liberty of Motion is allowed to the Heat, by Reason of the languid Contractions of the Solids; so that the Blood, for Want of its Humidity, grows dryer and colder, through an Implication of its igneous Particles for Want of Motion.

From a Suppression of the Hemorrhoids, the Blood may grow more cold and dry, as often as the Blood so to be evacuated is circumstanc'd, as Physicians generally suppose it to be, that is, dry, gross, and cold; tho' it is not in Reality such, unless the whole Mass partakes of the same Qualities, and in that Case a Suppression of the Hemorrhoids only is a Means to increase

the Quantity of a distempered Blood: And thus a Tumour in the Spleen may occasion a dry and cold Blood, by giving to it a Mixture of Particles endewed with those Qualities, and from which the Tumour was occasioned; and this Matter in the Spleen is undoubtedly in the greatest Degree a *Lentor*, because from its very Structure it appears that nothing but what is very gross ever flows through it: But unless such a Tumour is raised from some Fault of the Spleen in its first Conformation, or from some Fault since occasioned, it could not be there produced from cold and dry Matter, without such Particles before abounded in the Blood.

The *Antecedents* therefore to a *continued Periodick Quartan*, by Means of a dry and cold Blood, generate fewer and less vivid Spirits, and on that Account disorder the Blood in its Motion, and also in its Quantity, by a Want of its due Humidities: Its Qualities must likewise be vitiated, because strictly a cold and dry Blood is not natural to the Body of any Animal, and particularly that of a Man. The Blood then being granted to be cold and dry, there will be in it a Sluggishness, or a *Lentor* in the highest Degree resisting Motion; for as the Quality of Dryness is in it self very opposite to Fluidity, and there is no
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Humidity supposed to be mixed with it, by which it would be rendred more fluxile; and also as by Coldness, which is added to that other Quality, there is put an Inability or Deadness upon the moving Powers, and upon that Aptitude to Action which is received from Heat, it cannot but happen that from both these Circumstances jointly there must ensue a *Lentor* in the Blood, that will be very difficult to be set in Motion.

But because in this Condition there is not a total Impediment to the Exer-
How its Concomitants.
 tion of Heat, and as that which makes its Escape is under no Restraint from Humidity, such a *Lentor* will be joined with some Measure of Heat: And from hence it comes about that when it is accumulated in the capillary Arteries, it will adhere to them, and that very obstinately, by Reason of its great Degree of Dryness; but it will not yet adhere so as to hinder all Manner of Disengagement of igneous Particles, whence even its Accessions may come on without any Perception of Cold. But whereas this whole *Lentor* is much more dry than that which produces a *Tertian* or a *Quotidian*, therefore even its more liquid Parts, which are washed from it by the preterfluent Blood, and carried with the Stream in the Course of Circulation, will be more viscid than
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that which produces the Returns of a *Quotidian*, or a *Tertian*; and therefore will it more slowly move along the Veins, and will not re-accumulate in the Arteries but every fourth Day; either because it requires so much Time to finish its Circuit through the whole Length of the Canals it is obliged to circulate in, before it can reach back again to the capillary Arteries; or because it cannot in a lesser Space of Time ferment, maturate, or be generated, as before explained.

Its Terminations will be without Sweat for the same Reasons, as it happens that a continued *Quotidian* or a *Quartan* do go off in like Manner without Sweat: and further, in this Fever it more particularly holds, because the Viscidity of the Humour is extremely great; as it is manifest from the Proposition before us, that the Blood whence they are to be derived, and would otherwise admit of Exsudation through the Pores of the Skin, is in the highest Degree thick, dry, and adhæfive.

The Differences of the Pulses are manifest from the general *Propositions*; but because the *Lentor* is supposed colder, that is, colder than in a *Tertian*, as above explained, the Quantity therefore of Heat which escapes will be less, and therefore a less Perception of it through
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the Body; that is, there will be a weaker Heat than in a *continued Tertian*: But further, because this cold *Lentor* is not accompanied with such an Humidity as might repress the Activity of its Heat, but with the Quality of Dryness, whereby the igneous Particles without Mixture act on all Sides without any Check, and penetrate through the Substances of the Parts, as it were naked, whereas in a *Quotidian* they rise with some Mixture of Humidity; the Heat therefore of a *Quartan*, on Account of its Smalness in Quantity, may be less than in a *Tertian*; but for Want of Humidity to restrain its Activity, and mitigate its Sharpness, it may communicate a brisker Perception than in a *Quotidian*: But because where the Heat hath greatest Power, there the solid Parts will be most dried; and where there is the greatest Dryness, there is the greatest Thirst; when therefore in a *Quartan* the Heat is less than in a *Tertian*, but the Want of Humidity greater than in a *Quotidian*, it will happen that there will be a lesser Thirst in a *Quartan* than in a *Tertian*, but greater than in a *Quotidian*, because in this that Humidity which is supposed in the *Lentor* is not totally exhaled.

Further, As the Urine is compounded of hard and watery Particles, and that
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these are by this *Lentor* greatly fixed; by that weak Motion, or lesser Compression in the Accessions, they cannot be separated, nor derived into the urinary Ducts, but the aqueous Parts only will be separated, which will render the Urine crude and thin; but upon the Increase of the Fever, the compressive Force will be raised, whence the grosser Parts will be also set at Liberty, and excerned by Urine, whence it will be higher coloured, and more digested; but because these Particles are set at Liberty, and disengaged from a very dry Blood, they will not be equally disposed for Separation with the Urine, and Solution therein, so that the Urine will be more crude, or more concocted, according to the Dispositions of such Particles to be carried through all the secretory Windings, and dissolved by the aqueous Parts of the Urine. But because by Nature we are mostly inclined to Heat and Moisture, and for the most Part we are nourished by Meats that partake of the same Qualities, and even to the Meanest, Plenty of Water is not wanted for their common Drink; therefore the Blood can seldom be so far vitiated, as to become both cold and dry, or to contract a *Lentor* that will produce a *Quartan*, and consequently a continued *Periodick Quartan* will

will hardly ever happen: But when it does come, because by Viscidity and Coldness of the Blood there are very little Spirits generated, and great Inaptitude to Motion occasioned; and also that there is very little of that left in the Blood, which, when mixed in the nervous Juice, will contract the Muscles, and in Plenty of which, Strength and Health consists; therefore a Fever so circumstanced must occasion great Dejection and Faintness. But all the other *concomitant* Affections of a *continued Periodick Quartan*, are to be understood from their Explanation under an *intermitting Quartan*.

Further, Because such an obstinate Degree of Coldness and Dryness cannot but with Difficulty be warmed and moistened, hence it happens that there is more Time necessary before it can be accomplished, and therefore the Fever may be protracted for 40 Days or more; and unless then the *Lentor* is de- *And Consequences.*
stroyed, as there is nothing consentaneous to Nature in such a cold and dry Blood, there must ensue a depraved Constitution, or a Cachexy, or its Consumption, so as to bring on a perfect *Tabes*, as that is attended with such Dispositions of Cold and Dryness; or where a febrile Heat can raise a Warmth in the Parts,

Parts, the Body will then in like Manner waste through Dryness and Heat.

But yet if this dry *Lentor* could in some Measure admit of a re-moistening, so as to be washed out of the Capillaries, and quite dissolved, not suddenly, but by Degrees, it may finish its Circuit through the Vessels by the fourth Day: for upon its first Admission of Moisture, that which is its dryest Part cannot be rendred more fluxile than that which is expressed from it more liquid, and therefore a *Quartan* will be produced that is not *continued*, because there will be a Time when there will be no *Lentor* in the Arteries, and between every Return of which some Space will be left, wherein the Body will be as in perfect Health, that is, there will succeed an *intermitting Quartan*.

In the third Place then it may be affirmed, that this whole Series of Affections does not necessarily depend upon the Blood's being vitiated in Motion or Quantity; for a Fault is first in the Blood, the Conditions of which may indeed affect its Motion or Quantity, so that the whole Series of Affections, as appears from what hath been explained, may also succeed, but the Differences of Pulses cannot in many Respects be but from the primary Fault therein, whereby it is vitiated in Quality.

A continued Periodick *Quartan* therefore is a Fault in the Quality of the Blood, wherein it is rendred less fluxile by Means of a certain *Lentor*, the dryer Part of which adheres continually in the Arteries, its more liquid Part breaking through, and recurring every fourth Day, &c. as above explained; the Order of the Returns only being changed, from every Day to every third or fourth Day; so that in these three Diversifications of Fevers, the Heat which is disengaged from its *Lentors*, and circulates through the Blood-Vessels, will be differently circumstanced in every one: In a *Quotidian*, what escapes will not be alone, but joined with a considerable Portion of an aqueous Humidity, with which the *Lentor* of a *Quotidian* abounds; what escapes in a *Tertian*, is in greater Quantity, and joined with a less Portion of aqueous Moisture, as the *Lentor* of a *Tertian* is more tenacious and dry, or containing less Humidity; and lastly, what is disengaged in a *Quartan*, is very little in Quantity, and mixed likewise but with very little of aqueous Particles, as the *Lentor* in this Case is dry and cold.

PROPOSITION XXVII.

The Antecedents to a malignant Fever may indeed vitiate the Blood's Motion, or Quantity; but its Concomitants and Consequences do not necessarily depend but upon its vitiated Quality: and what this Kind of Fever is.

There is nothing more commonly received amongst Physicians, than that a *malignant* Fever arises from some malignant Quality in the Humours, whereby they contract a Kind of poisonous Nature, and by Vertue only of this poisonous Taint, are derivable all the *Concomitant* Affections of a *malignant* Fever. But because also a Disorder in the Blood's Motion and Quantity must necessarily be the Result of those supposed Malignities, as by that is made a Change, wherein neither the Spirits are separated in due Order, nor the Blood supplied in due Quantity, and a vitiated Quality is supposed; therefore from the Premises it must appear, that the Blood may in this Case be disordered in its Motion, Quantity, and Quality. But because it

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is not assigned by any what this poisonous Quality is, or by what Means it operates; if therefore we shew, that whatsoever is joined with, or follows, a *malignant* Fever, is necessarily the Effect of a *Lentor*, as already laid down, either rendred more tenacious, or fermentable, or resolvable into somewhat different from a natural Blood, it will then be demonstrated what is this Malignity or Poison; and it will at the same Time be made manifest, that whatsoever is joined with, or succeeds a *malignant* Fever, does not necessarily depend but upon the Blood's being vitiated in its Qualities, since a *malignant* Fever can differ in nothing from those before described, but in a greater or lesser Degree; whether it comes from a more stubborn *Lentor*, or from one resolvable into somewhat very different from the natural Constitution of Blood, as the *Concomitant* and *Subsequent* Affections of those other Fevers have no necessary Dependance but upon a Blood vitiated in its Qualities.

And first of all, that the *malignant* Malignant Fevers which most commonly happen, do derive their Origin from the same *Lentor* as the Fevers already enumerated, does from hence manifestly appear, that most *malignant* Fevers are the *Consequences* of such; and of *Quotidians* Fevers the Consequences of those that are not so.

tidians and *Tertians* particularly, wherein there is a more aggravated Heat, disposing to Fermentation and Solution of the *Lentor*, which in *Quartans* are more difficultly accomplished, because therein the Heat is remiss, and a great Dryness attends them, both which keeps the *Lentor* from Fermentation; and thus a *simple intermitting Tertian* easily changes into a double *Intermittent*, and this into a *Continuent*, and that into a *malignant* Fever. Since therefore all these Changes are only from a lesser to a greater Tenacity and Adhæſion of *Lentor*, as appears from what is above explained; the last Degree also of those Fevers orderly succeeding one another, or a *malignant* Fever, must necessarily be from the same Origin as the rest; and as those go on from lesser to greater, even to the utmost Aggravation of *Lentor*, the last must be from the same as the first, and consist in the highest Degree of *Lentor*.

How the Blood
must be affected
in a ma-
lignant Fever.

But because with the highest Degree of *Lentor* is joined the utmost Dissolution of the Blood's most moveable Parts, which are continually acting upon it, in Order to its Reduction and Solution; and as by such Solution it cannot be changed into natural Blood, there will result a Fluid in the Vessels, suited neither for Nourishment, nor Motion, nor Sen-

Sensation; in some Parts more gross, and in other more fluid than natural; for it is not possible that it should in all Parts be equally dissolved, as it may adhere in some Arteries, while it escapes through others; in these it again returns and obstructs, whilst through those it passes on with Freedom; because whatever is most in Freedom of Action, will work upon the *Lentor* in this or that Artery, and force it away, or dissolve it, as it finds greater or lesser Resistance in this or that Vessel, and which is necessarily greater or lesser, according as the Part wherein the *Lentor* is accumulated is endued with stronger or weaker compressive Powers; as it hath been already sufficiently explained.

Whether then a *malignant* Fever succeeds others, or comes at first of it self, let the Blood be as here assigned; that is, compounded of a *Lentor*, and other more active Parts, in the highest Degree of Solution; and that these active Parts gradually operate upon, and dissolve that *Lentor*; these therefore in some Measure will be embarrassed therewith, and lose their Violence; and as amongst them igneous Particles will be inclosed, until the Solution of such *Lentor* is accomplished, the Heat will lie, as it were, buried in it, and incapable of Exertion; and therefore from hence must it

Appearances at the Beginning of a mild Fever, and a remiss Heat.

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come

come about that its Activity, that is, the Heat it self will be less perceived in the Body, for the same Reason as a Person is not so much warmed by the Fire when Ice, or any cold Body is interposed; on which Account the Fever will seem of a milder Sort, as the Heat at the Beginning will be remis; so that while the worser Symptoms as yet lye concealed, there will be no Suspicion of a dangerous Distemper.

*A great Loss
of Strength,*

*without any
manifest
Cause.*

But because all the Strength we are able to make Use of is from a Conflux of nervous Juice, with the more active Parts of the Blood in the Interstices of the Muscles, so long therefore as these flow without Interruption through the Arteries, there may and will be a good Quantity of Strength; but when the *Lentor* comes to dissolve, and mix therewith, they will not flow through the Arteries, or by Means of such Mixture cannot be separated in their proper Strainers, and therefore such Conflux will be destroyed; a little after the Beginning then there must be a great Decay of Strength through a Defect of the Means to produce it: And as this Combination is in the Blood-Vessels, and exhibits no other obvious Affection, either to the Patient or By-standers, such Imbecillity will seem to be without any manifest Cause; and in like
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Manner, because during such a State of Entanglement, a deceitful Appearance of a mild Fever presents it self, and the Heat continues moderate, such Imbecillity will seem much greater than otherwise is accustomed to attend Fevers of such a favourable Aspect. But in the mean Time suppose this *Lentor* to ferment, and that which obstructed in the Capillaries to wash away, and flow through the Blood-Vessels, not only the Heat then, which was before at Liberty, will begin to act with more Briskness, but that also will be set loose which was entangled with *Lentor*, whence will arise a great Increase of its Perception all over the Body.

But from this Augmentation of Heat, ^{Inquietude,} and a Conflux of *Lentor* along with it, ^{&c.} to all the Parts of the Body, there will Uneasinesses arise both from the Afflux of *Lentor*, and the Perception of Heat, whereby the Patient will toss about to find Cold and Refreshment, and roll about in his Bed from one Place to another. For these same Reasons likewise will he draw his Breath with great Vehemence and Thickness, with Sighings, from a Perception of violent Heat in his Breast and Lungs, and a pressing Weight upon the same Parts; for the *Lentor*, as often as it arrives at the Lungs, will occasion Difficulty of

Passage through their Vessels, and create such a Sense of Weight and Pressure; and the Patient fetches very deep and strong Respiration, in Expectation to throw off such Uneasiness. The Energy likewise, or great Quantity of an extremely hot Blood contained in those Trunks of the *Cava*, and great Artery within the Breast, and also in the whole Substance of the Lungs, will excite such a Sensation there, as any Person would naturally endeavour to throw off by thick and deep Respirations of cool Air; and which Sort of Respiration is in a great Measure the Effect of a *Stimulus*.

Irregular
Sweats.

But while a Fermentation goes on, and the *Lentor* is broke into its constituent Parts, the saline and aqueous Parts likewise get at Liberty, so that when the *Lentor* begins to wash out of the Capillaries, and flow in the Current, it will not obstruct the Ducts conveying it from the Glands to the Skin, whence its Parts that are at Liberty, and fit to appear in the Form of Sweat, will get through the Pores of the Skin, and cover it with Moisture; but as this *Lentor* may again recur, and be so closely crowded together as to adhere a long Time before it ferments, or may obstruct the glandulous Ducts, hence it will sometimes break
out

out in Sweat, and at others not; now more sparingly, and then more plentifully, from the whole Body, or some Part only, as the *Lentor* is more or less broke, or dissolved in this or that Part of the Body, or according to its Returns, &c. And every Sweat thus breaking out may be hot or cold, according to the *Twenty first Proposition*: And hence Sweats may be without Regularity, or uncertain in all of their Properties.

Because the first of this *Lentor*, or *The Pulse* that which is as yet not at all broke, *small*, accumulates in, and adheres to the Arteries, or whether because a great deal of liquid Moisture exhales out of the Vessels during the Agitation of a febrile Heat, or whether some or all of these Circumstances happen at once; therefore there will be a much less Quantity of Liquid in the Arteries, than in a natural State, whereupon the Pulse will be small. For the like Reason both the Quantity of Fluid through the Nerves, and of Blood to influence the Muscles, will be less in Quantity, and of less Energy, and therefore will the Heart contract more weakly, whence a lesser Velocity will be communicated to the circulating Stream, and consequently the Pulse rendered weak; nay, although the Spirits separated should be sharper, yet in a lesser Quantity of Blood they

will be separated proportionably fewer, and on that Account also the Pulse will be rendred weaker. When therefore the Spirits get more at Liberty, and the Blood acquires a greater Degree of Solution, they will be then more vivid in their Motions, and their Excursions will be copious, quick, and sudden, and consequently will they more frequently distil into the Interstices of the Muscles, whereby the Pulse will become more quick: But if all these Requisites to Contractions happen to be mixed with other Bodies, natural or not, in such Manner that with them the Spirits influence the Muscles and the Heart in the same Measure as in a natural State, the Pulse will then be as slow as natural; and if they are of the same Energy, and the Quantity of a distempered Fluid at that Time flowing through the Vessels, compounded of a turbid and a limpid, a thin and a viscid Blood, and consisting of unequal Particles, be the same as the Quantity of natural Blood, the Pulse will then be like to one that is natural, in Magnitude, Frequency, and Strength: But on Account of that Inequality of Mixture in the Fluid thus passing the Blood-Vessels, there will result a thousand Inconveniencies, and such too as are fatal, as we shall presently come to demonstrate.

Suppose

Suppose then the *Lentor* at the Beginning of this Fever to be very great; during that State then very little will flow through the Arteries, whence the Pulse will be then very small; again, when the Heat is disengaged, if it is more at Liberty in the Brain, as it really is, and finds not so much *Lentor* in the Arteries of the *Pia Mater*, that in Order to its Fermentation its *Impetus* ought to be slackened and restrained, there will be generated a very sharp Fluid in the Nerves, and rapidly flowing through them; whence the Heart will frequently contract, and there will ensue a Pulse both very small and very quick at the same Time. And because from such an inconstant Solution, Motion, and Return of this *Lentor*, it necessarily happens, that sometimes this and sometimes that Artery is obstructed, and as the rest of the Blood is sometimes more lax, and at others more implicated, it comes about that the Arteries of the *Pia Mater* are now more, and then less obstructed; that is, the Spirits are there generated sometimes plentifully, at others sparingly, at others sharp, and at other Times sluggish; and as the same may be likewise said concerning the Blood which is to influence the Muscles, it is plain that on this Account the Pulse for the most Part will

be changeable, both as to its Slowness, Frequency, Magnitude, and Strength, which are the principal Affections of the Pulse.

How the
Urine.

But as in the first Days it may happen, that this *Lentor* may not be enough fused, as to deposite any of its distempered Particles by Urine; and as it may happen that the Motion of the Blood may be so near to that of a natural State in this very Case, as to give a Pulse like to an healthful one, such a Velocity of this may be given through the Kidneys, as is necessary to proportion the Quantity of gross and fluid Particles with each other, as in a natural Urine; and consequently also that with this undissolved *Lentor*, either none or few of the Particles necessary to constitute a natural Urine may be detained: When therefore these Conditions are given, the Urine will be fecerned like to what is natural, accompanied notwithstanding at the same Time with such distempered Symptoms, as are the necessary Result of a Blood thus compounded of very thin and very viscid Parts. But if with the *Lentor* is entangled any rigid Particles that would give to the Urine Consistence, Colour, and Sediment, or the Velocity of the Blood is so great, that nothing but its most liquid Parts can be separated in the Kidneys,

Kidneys, then of Necessity the Urine will be made thin and crude; and as it contains nothing that can fall to the Bottom, it will be without Sediment: But if this *Lentor* be in some Measure dissolved, so that most Parts of the Blood have a Mixture of it, somewhat more gross may chance to be separated, because the whole is reduced almost to equal Fluxility, so that the thicker Particles will find but little Obstruction, by Means of such an acquired Fluxility, and be separated with the Urine; but this is not like to that from whence a natural Sediment is produced, howsoever it may appear as a Sediment, because it falls to the Bottom of the Urinal, and is so very much unlike it, as to appear more like Excrement. This may also happen when there is not so great a Corruption of the Blood; but when its Velocity is such, as will admit of the Separation of this gross Matter through the Kidneys: And for the same Reason, when the like Circumstances and Conditions are given, will there be a Urine made that is thick, coloured, and turbid, with a thick, coloured, and turbid Sediment.

But because the more disengaged the Heat is, the more sharp it will be; in this Constitution of Blood, by Means of its fused *Lentor*, some of its more
The Heat mild at first.
 viscid

viscid and thick Parts will be continually joined with it; tho' in a *Causus*, the Heat is altogether free of such Mixture; and in a *malignant* Fever, notwithstanding the Heat is very intense, yet because it is implicated and restrained by the viscid Particles of a dissolved *Lentor*, in Comparison to that of a *Causus*, it will be less than that, which is very intense by its Nakedness, and the Loss of all the igneous Particles: Yet because the Constitution of the Blood in this Case is much worse than in a *Causus*, although its Heat is comparatively less, there will be joined therewith more grievous Symptoms than in a *Causus*; and the same Measure of Heat will be apparent in those who are not sensible of such a Deviation from a natural State.

Thirst how,
Ecc.

Because the Thirst arises from a Defect of Spittle, and a due Moisture to soften the Membranes, and both these are deficient, either from a drying Heat, or some Obstruction hindering their Influx into the Mouth, or from some Viscidity restraining the humid Parts, and preventing their Separation in such a certain Measure of Compression; if therefore the Heat should be more remiss, that is, very little drying, as often as there shall be given a Viscidity that shall restrain it, or an Obstruction that shall

shall hinder its Passage to the salival Glands, or any other Vessel from whence such Humour is derived, or both, there will ensue a Thirst, and that about the Mouth only, or to the whole Body besides, without an Intension of Heat; but as in the supposed Constitution of Blood there is a *Lentor* given, from which may arise Obstruction, or Implication of Humidity, or both, it appears that in a *malignant* Fever there may be given a Thirst much greater comparatively than the Heat.

Yet it may also happen, that no Thirst shall attend this Fever even when the Heat is intense, and the Tongue dry; that is, as often as the Blood is so broke in its Texture, that the Heat is felt sharper than ordinary, by the Abundance of its Quantity and Liberty, but that it is attended at the same Time with somewhat moist, that is, too difficult for the Heat to attenuate to the Degree of Evaporation; for from hence the Parts will in some Measure be softened, although the Tongue it self is dry at the same Time, by the Steams of hot Particles continually rising from the *Abdomen* through the *OEsophagus*, and the Lungs through the *Trachæa*, the *OEsophagus* it self yet remaining with some Measure of Humidity; and that this Dryness upon the Tongue is only
super-

superficial, is manifest from the Power of Speech; for without the Motion of its Muscles, and the Preservation of their due Moistures, that Faculty could not be exerted. But although this Kind of Fusion in the Blood does not happen, and the Dryness of the Tongue is not only superficial, but deeper; nay, suppose it extended to the whole Body, and a parching Dryness was upon every Membrane; it might even then happen that no Thirst should be felt; because by such extreme Drought, the Nerves are so parched, that their opposite Sides fall into Contact with one another, and in some Measure cohere, insomuch that the whole Nerve is stiff, so that neither a Sense of Thirst, nor of any Thing else, can be perceived by it; that is, where such Dryness is in the highest Degree, and protracted; or when the Heat hath consumed all the Moisture; or because the *Lentor* hath obstructed the Canals, whereby the Moisture cannot flow into the Interstices of the Membranes.

*Inappetency,
&c.*

But because by Means of such a depraved Constitution of Blood, bad Humours are generated, and derived from it into the Cavity of the Stomach, which there prove irksome, when they move along its Coats; when therefore any Thing whatsoever is offered to be taken

taken in, we naturally fall into a Loathing thereof, from an Expectation and Fear of its occasioning the same irksome Perception as is felt by disturbing and putting into Motion the distempered Matter therein already secerned from the Blood; nay, we not only fall into a Loathing, but a remarkable Aversion, so considerable, as to excite from it self a Perception of Uneasiness at Stomach, whereby it will be drawn into Vomiting, and contract so as in Reality to give Motion to those contained Humours, and excite great Disorders. But this Nauseousness and Vomiting is manifest from the *Twenty first Proposition*, and from what hath been said concerning a Loathing of Food of any Kind, and from what Cause soever.

The frequent Shakings which recur without any Manner of Regularity or Certainty, often in one Day, may easily be understood from what hath been said concerning a *Lentor* with Cold, and from the Nature of the Blood, which is here supposed to be viscid in such Manner, that as often as it accumulates in the Arteries, sufficiently to obstruct the Exertion of Heat, there cannot but arise a Sense of Cold.

From this very Viscidity of the Blood proceeds the Weight that is felt all over the Body, and as it were a Contracti-

on

on of the Parts together, as it appears from the Explanation of that Cold, as produces a Pain even in the Bones, as if they were breaking; and this Sensation will be by so much the greater, as the Quantity of Spirits, by Means of such Viscidity in the Blood, and Exhalation of Heat, is generated less than usual; which Spirits, in their natural Vigour, by strong Contractions of the Muscles, are able to overcome the Weight of such obstructing Viscidities.

Delirium.

The *Deliria*, which are possible to happen in this Constitution of Blood, are knowable from the *Twenty first Proposition*, and from the Doctrine of *Deliria* in general; because therefore there is here such a Diversity in the compounding Particles of the Blood, the *Lentor*, or other Humours, will flow on or stop, but not altogether without Pricking and Tension, from the *Impetus* of the igneous Particles; and this will be diversified without any Certainty, according to the Conditions of Motion or Obstruction in the Arteries of this or that Part; and hence wandering Pains will arise, here or there, and of longer or shorter Duration.

Sweats, &c.

Sweats will frequently ensue from the Solution of such Parts as are able to break through in that Manner, and they will be short and little, either because

cause the Heat, which makes this Solution, exhales a great deal of Moisture insensibly, or because the *Lentor* so entangles both the saline and aqueous Particles, that they cannot be disengaged and separated by the Compressive Power in Being: Hence also they are of no good Effect, because such Sweats are not from the Expression and Expulsion of a noxious *Lentor*, but something separated from it, that leaves it yet more injurious to the Constitution, while all its Humidity is hereby drawn off from it: These Sweats may often happen at the Beginning of the Disease, and when the Solution of the Humours first takes Place; but on this Head enough hath been already said above, whence all that belongs thereunto may be understood.

But here also may frequently happen redness of the Eyes; for as the Blood is considered as a Vehicle composed of gross and fluid Parts, whenever any of the grosser Parts obstruct in the Arteries running through the White of the Eye, so as to hinder the Flux of what is more fluid, it will, by the Motion of its igneous Particles, and the continual Afflux of circulating Blood, distract and thrust outwards the same Arteries; and in all those Parts that are open to the Sight, discover a Redness;

Redness; and it will the more frequently happen thus in this Circumstance, because the Blood in such a Constitution is more apt to give such a Colour.

Spots, &c.

Further, in this Distemperature of Blood, where it is both thick and thin at the same Time, it is manifestly disposed to produce Spots and Pustules all over the Body, by the Demonstration in *Proposition XXI.* and that those Spots and Pustules may be of any Magnitude and Colour, as livid, black, green, and any others of a worse Hue if possible, and of a worse kind; for in the Constitution of Blood, here supposed, there is a continual Fermentation, and Solution, from whence, as some Portion of it is derived, by Means described in that *Proposition*, to Parts that are transpirable, and leaves others more gross behind; which, as it is fermentable, before it can separate or perspire, must make Spots and Pustules, greater or lesser, as the obstructed Matter fills greater or lesser Space; and they will be differently coloured, according to the Diversity of the obstructed Matter, the worst kind of which will be black, dusky, green, or livid; at the same Time giving Indications of the Grossness and fixed Nature of their compounding Particles; but this however may not constantly prove so.

But

But because that which is resolved into perspirable Matter, or fermented into Suppuration, is then somewhat easily disposed to Fluxility, and Expression, since both of these Circumstances are derivable from that Disposition; therefore that Matter which ferments as soon almost as it comes to lodge, either remains upon the Part, or is resolvable by Perspiration; and where it is derived to Parts of the Body, where the Skin is thin, but subjected to frequent and vigorous Motion, it will not accumulate, but perspire as fast almost as it collects, even although it ouzes through the Vessels, and extravasates: Thus the *Small-Pox* and Eruptions of like Kind come to Suppuration, and remain, but the Measles are dissipated by Perspiration before they suppurate. Therefore all Pustules and Eruptions of this Nature, as they consist of Matter easily reducible to Fluxility, they cannot break into Parts of great and continual Motion, and where the Skin is thin, as upon the Back and Breast; but in the Hands, Feet, and Face, that is, Parts that are endewed with a hard, thick Skin, and have but little Motion: If therefore upon the Breast and Back be accumulated Matter, that would otherwise generate Pustules, that which is its thinnest Part will

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be spent in Vapour, or Perspiration, while the thicker Part remains behind in the Skin, or the Cuticle, or between both, without raising any Tumour, but giving some Colour thereto; whence there will arise Spots, though no Pustules, like what we call Flea-Bites, or bigger; and these will cover the Back, Breast, or any other Part of like Conformation. From hence also it appears, how even Pustules may happen upon the Back or Breast, and Spots in any other Parts of the Body, according to the different Degrees of Perspirability in the Matter generating them.

Redness in the Face.

From this same Diversity in the compounding Particles of the Blood, it likewise happens that the Face may be more florid and lively, when the Blood passes through the Vessels there, like what is natural, and does not obstruct them with a *Lentor*, so as to prevent the Influx of Spirits for the Invigoration of the Eyes, and other Parts; and at another Time like the Countenance of a dead Person, when both the Motion of the Blood, and the Spirits in the Nerves, are determined in a very different Manner; but even at the Point of Death the Face may seem florid and lively, although just before it looked never so ghastly; that is, when

when the natural Strength is so far spent, that the thickest Part of the Blood begins to stagnate in the Capillaries of the whole Body besides, the thinner Parts, and that which recedes least from its natural State, yet continuing to flow through the Vessels in the Face.

Hence follows likewise a Dropping of Blood from the Nostrils, especially in the Beginning of the Disease, either from a *Lentor* obstinately obstructing the Vessels, and forcing the Blood to crowd through the Coats of the Arteries, where they are weakest, or from the *Impetus* or Activity of the more thin Parts occasioning the same Rupture, or from both Causes conjointly; and this Eruption of Blood will be different in Quantity, as the Energy of Heat and Obstruction is different, that is greater or lesser.

Further, From this extraordinary Perturbation of Blood, and Existence of distempered Humours, it comes about that the Seeds of Worms are hatched; and if these come to their Growth in the Intestines or Stomach, they are capable of Expulsion either by Stool, or upwards by the Mouth or Nose, as the Passage from the Throat to the Nostrils is kept open by the *Vomer*; but they may be also generated in the

salival Glands themselves; for it appears that Worms are often observed to breed in such Parts.

But all other Affections, which are generally ascribed to *malignant* Fevers, may be understood from the *Twenty first Proposition*, or from particular Diseases; such as are Sleep; a Lethargy; Watching; Loss of Memory; various Appearances; frightful Dreams; Confusion; Swimming; Trembling; Convulsions; Inquietude; Anxiety; Dimness of Sight; Deafness, and Ringing in the Ears; Loss of Smell and Taste; Heart-Burn, and an unquenchable Thirst; Nauseousness; loose and fetid Stools; Swellings in the Neck and Groin, of Difficulty to cure, and which very often go in again; the Tongue dry, rough, and black; the Mouth bitter; and the Extremities changing suddenly from cold to hot.

Consequen-
ces:

But, lastly, because by this Kind of Fermentation, and Change of Blood into Humours that are not natural, somewhat may be generated that shall exhale in Steam from the Body, that is capable of insinuating into the cutaneous Pores of other Persons, and reducing the Blood of such into the same State of *Lentor* and Fluidity, that is, both too thin in some Parts, and too thick in others; if therefore a
Change

Change is made of this Kind, and arrives to this Degree in any one Patient, all other Persons near the Sick may fall into the same Disease, by the Insinuation of morbid Steams into their Pores, which shall alter the Crasis of their Blood, and produce the same Affections; and because when the Blood is arrived to this Degree of Distemperature, it will be very difficult to bring it back into a natural State, on which Account not only most who are seized with this Distemper die, but that which was single before, or affected but one Person, spreads also to others, becomes popular, and deadly; that is, in short, a *malignant* Fever very easily brings on a *Pestilence*. Wherefore the whole *Proposition* appears true; and as all these Affections depend upon this *Lentor*, and a Blood thus vitiated, it is manifest that the immediate Cause of a *malignant* Fever, is the same as above explained, and that it hath its necessary Dependence on a vitiated State of Blood, as to its Qualities.

A *malignant* Fever therefore is a Fault in the Blood's Qualities, whereby, from a certain *Lentor* capable of various Degrees of Fluxility and Fermentation, sometimes this, and at others that Part is obstructed, as appears from the Course of the foregoing Demonstrations.

PROPOSITION XXVIII.

The Antecedents to a pestilential Fever may vitiate the Blood in its Motion, Quantity, or Quality: But its Concomitants and Consequences do necessarily depend upon its vitiated Qualities: And what is a Pestilence.

Antecedents,
how they operate.

As all the *Antecedents* to a pestilential Fever agree in vitiating the Blood, the *Proposition* would stand demonstrated without any further Explanation: For although they vitiate the Spirits themselves immediately in Quality or Quantity, by a Mixture of Viscidities, or Humours that shall ferment more briskly than natural, the same Causes will also for the same Reasons vitiate the Blood in its Quantity; although even these very Faults in the Blood's Quantity and Motion, are necessary Attendants upon, and Consequences of the Blood's Fault in Quality; and therefore we must here conclude, as above explained, concerning other Kinds of Fevers.

Yet

Yet moreover this Affair is in it self so plain, that no one can doubt whether in a *pestilential* Fever the Blood is changed in its Qualities; for whether this Change is ascribed to a Poison, or any occult Cause, it is taken for granted by all, that the Blood must be altered from its natural Qualities, and it stands already demonstrated so to be in the foregoing *Propositions*; and what still strengthens this Matter is, that the *malignant* Fevers just now described, whose very Essence consists in this State of Corruption, wherein the Blood is too thick and too thin at the same Time, are amongst the *Antecedents* to this of a *Pestilence*. Moreover, the Eruption of the *Small-Pox* and *Measles*, not only upon Infants, but adult Persons, and also the frequent Appearance of Carbuncles, Buboes, Boils, &c. do manifestly indicate that some Part of the Blood is rendred too compact and adhæive, while other Parts are too much fused and liquid, and exerting too much *Impetus*; and that by the Accumulation of such upon particular Parts, are generated most untoward Swellings, tending to Fermentation, Cold, or Heat, as hath been shewn in the *Twenty first Proposition*, and others Antecedent to that. And from that Eruption

tion particularly termed an *Anthrax*, may be drawn an irrefragable Argument, that the Quality of Blood is vitiated in a very extraordinary Manner; for that is a Swelling extreamly hot, and therefore there must necessarily be collected upon that Part something gross, that by the *Impetus* of an intense Heat acting upon it, becomes at length broke, and excites all round it a burning and scalding Heat.

Why fatal
to most.

And therefore in a *Pestilence* we suppose the Blood to be constituted, and changed after the same Manner as in a *Malignity*, but that a *Pestilence* is the highest Degree of Malignity; and as a *malignant* Fever may be diversified, as the Blood is differently coagulated or fused, so likewise a *Pestilence* may be varied proportionably to the Diversities of the same Circumstances, to which also may be added, that in the latter most die who are seized with it; and which cannot be at all difficult to conceive of, when the Distemperature of Blood is in this Case arrived to so great a Height, that all the Power of Art cannot restore it to its natural Constitution; or for Want of a more thorough Insight into the Nature of this Coagulation and Fusion.

Further,

Further, As this Coagulation and Fusion may go on so far, as to set at Liberty, and perspire through the Surface of the Body, or with the Breath in Respiration, many noxious Particles, which may be so subtle and active, as to enter the cutaneous Pores of other Persons, or mix with that Air which they draw, in Respiration, and when got into the Body, be able to make the same Change in the Blood, both as to its Coagulation and Fusion; hence it comes that such a Fever proves contagious, which is an inseparable Requisite to a *pestilential* Fever.

But this is not only thus brought a-^{The Contagion mani-} bout; but also the dissolved, and dissolved Particles may longer adhere to some inanimate Bodies than others, as to woollen and linen Cloaths, Papers, &c. and these Particles may, by the Steam of a living Body, or by the Means of any other Heat, be put into Motion, so as to breath out of those Lodgements, where they quietly resided, and obtain so much Liberty, and Action on all sides, as will carry them into the cutaneous Pores of any Persons within their Reach, and infect them; and on this Account a *Pestilence* may be brought from very distant Countries, lying a long Time in such Manner concealed, and then suddenly break-

breaking out; with many other Circumstances of like Nature.

But if these subtile and active Particles be of that Nature, that they can penetrate the Pores of other Animals, and occasion a like Coagulation of their Blood, not only Men, but Brutes also, will be seized with a *Pestilence*; but this does not always very necessarily happen, because the Blood of Animals is different from humane Blood, so that although these Particles are supposed to get into it, it does not therefore necessarily follow that they must vitiate it, any more than will *Aqua Regia* dissolve all kinds of Metals; but yet Brutes of all kinds, or some of them only, will be seized equally with Men, when this subtile and active Ferment, which penetrates the Surface, is of that Nature, as will taint the Blood of those Animals with those *pestilential* Requisites.

As this kind of Contagion then can easily proceed from an infected Person at a great Distance, as often as the noxious Particles can reach another Person, and give that Degree of Coagulation and Fusion, as is necessary to a *Pestilence*; the more aggravated then will be this Calamity, and more easily spread, when a healthful Person is near to one already infected; and yet much more

more worſe, if it is in Contact with thoſe Parts, which more plentifully, and with a greater *Impetus*, breath out infected Steams, as is the Air ariſing from the Mouth and Lungs, which muſt be extreemly hot, or the Perſpiration of a Carbuncle when it is greatly inflamed; for in this Caſe the exhaling Particles will be in their greateſt Activity when neareſt the recipient Body, and likewise more denſe, that is, more numerous, and conſequentialy of greateſt Efficacy.

But it is not every one that is ſeized with a *Pestilence* from Contagion, by Means of Steams exhaling from any particular Parts of the Body; but only when theſe Steams, and the Air it ſelf, hath joined with, and interſperſed through it Particles of vitiated Faculties; and then this Kind of Fever will eaſily be communicated, and neceſſarily enſue, not only on Account of what gets into the Body with inſpired Air, but becauſe alſo the whole Body is ſurrounded with ſuch an Infection, wherein the noxious Particles floating about on all Sides, will endeavour to penetrate through the Pores upon the Surface, and get that Way into the Blood; for although the Skin is thicker upon the Surface of the Body, than that Pellicle covering the Veſſels in
the

the Lungs, and for that Reason it requires longer Time for such Particles to get that Way into the Blood, and the Habit of the Body, yet it is no Argument that they cannot get that Way at all, and be admitted into the Juices.

*Why popular,
and when.*

But from whichsoever of these Causes a Contagion happens, this Fever will easily become *popular*; and sometimes necessarily, when such a Contagion does not derive its Origin from Particles mixed with the Air, but exhaling from some particular Body; for then it cannot communicate this Fever but to those who are near the infected Person, or placed at a Distance, wherein the exhaling Particles are not so scattered as to lose their Efficacy, for that will be the Case when they are much dispersed: But because at the Beginning of these Fevers which are *pestilential*, there is but little Distrust of Danger, insomuch that Persons freely converse with the Sick, so that they receive the Taint into their own Constitutions, whereby themselves become infected, and communicate it likewise in the same Manner to others.

But then from the Number of infected Persons, many noxious Steams will gather in the Air; so that although
what

what exhales from any single Person may be so dispersed at a certain Distance enough to lose its Efficacy, yet that very Space shall be reached by Steams rising from many sick Persons at once, so that in every Point there will be collected a sufficient Quantity to infect all Persons drawing such Air, or exposed to its Insinuation through the Pores, with a *Pestilence*.

When Things are then brought to this pass, a *pestilential* Fever must necessarily spread, and become *popular*; but further also it will be made so when the Air is impregnated with the like Sort of Particles, not only breathing out from the Bodies of distempered Persons, but likewise from either putrid Carcasses, or Pits, or subterraneous Caverns, or from the Conveyance of Winds, or generated by unwholsome Blasts, or Changes of Seasons, with many other Causes of like Nature. But if before the Air is infected, it be known that there is a sick Person, or any Thing else that may spread a *Pestilence*, that is, a Fever communicable by Contact, and fatal to most; and if Care be taken that such Person is kept private till he dies, or recovers, or if whatsoever other communicating Cause be stopped in its Progress, then a Contagion will be pre-

prevented, and its Infection of the Populace; but under this Care, a sick Person is not to be said free of a *pestilential* Fever, because it does not spread amongst the People; for the Reason of its not spreading, is the Consequence only of Care to restrain it, and whereby it cannot communicate its Contagion; for if it had such Liberty of Communication, it would spread, and become popular.

All other Concomitants.

As for all other *Concomitants* of a *pestilential* Fever, they may be very easily and plainly understood, partly from the Nature of a *malignant* Fever, partly from the *Twenty first Proposition*, and partly from particular Diseases: And in this supposed Constitution of Blood, where it is both too thick and too thin, both a great deal of Spirit will evaporate, and a great deal will be entangled in the *Coagulum* or *Lentor*, whence cannot but ensue a sudden and great Decay of Strength, without any Perturbation of Mind, so that there be but enough Spirit left to actuate the Parts assisting in Cogitation; but the Mind will also be disordered when there is not such a Sufficiency of Spirits left; and this Sufficiency will happen both when the Quantity wasted is not extraordinary, nor its Qualities much hurt; which last may be often the

the Case in the Brain, by Means of the innumerable Occursions of the Blood against the *Plexus's* of the *Pia Mater*, whereby it is more perfectly elaborated than in any other Parts of the Body: And for the same Reasons may the digestive Powers be not so much perverted, as a Humour is generated more disposed to Concoction.

But this sudden Decay of Strength will be without any manifest Cause, as it depends upon an inward Concretion, and Fusion of Blood; the Patient will be restless, and toss about in Bed to seek a cool Place; the Heart will palpitate; and a Fainting and Syncope will ensue, as explained in our Account of *particular Diseases*. The Differences of Pulses may be understood from the foregoing *Propositions*. A great and burning Heat internally, while it is externally mild, or none at all, insomuch that the Hands, Feet, Nose, and Ears, shall be quite cold, happens; because whatsoever is most viscid in the Blood, will lodge in the capillary Arteries of the extream Parts, while the more liquid and fused Parts circulate inwardly, and excite a Perception of intense Heat, so that the Patient to his own Appearance will be extreamly hot, and through Im-
patience

patience throw off all Cloaths and Covering.

What we have here insisted upon, are the much more considerable of all the *Concomitants* which remain to be explained, every one of which are easie to be understood from what hath been already said; and it may further be collected from what hath been said concerning *particular Diseases*, what must be the Effects of a Blood unequally fluid, and compounded of Parts both more gross, and more fluid than natural. And why Death in this Case does also ensue, is as manifest; after which Spots break out, like to those who have been taken off by violent Poison; because they are the Stagnations of the thicker Parts of Blood between the Membranes, whilst the thinner evaporate for Want of sufficient Cohæion between the Blood's compounding Particles; and this Difference and Loss of Cohæion is the known Effect of Poisons, which kill by throwing the Blood into Fermentation; and therefore is the whole *Proposition* demonstrated.

A *pestilential* Fever therefore is a Fault in the Quality of the Blood, whereby there is a *Lentor* generated capable of such Motion and Fermentation, as will break it into perspirable Parts, which will insinuate into the
the

the Blood of other Creatures, and infect it after the same Manner, and of which Infection do most Persons die.

PROPOSITION XXIX.

Of Symptomatical, and Secondary Fevers.

The *Phlegmonodes*, *Erysipelatodes*, and *Typhodes*, which are termed Fevers, and are supposed to arise from true or spurious Inflammations, may be understood from particular Diseases, from the Manner of producing Inflammations, and from the Doctrine of Fevers hitherto explained; and the whole Matter is reduced to this, that whensoever there happens a considerable Tumour, all those Parts of the Blood that are more gross than natural will lodge therein, while those Parts which are thinner, and consequently of greater Activity and *Moment*, will continue in Circulation, through all other Parts of the Body; from whence there must arise a great and continual Heat, because only the

B b more

more fused and hot Parts of the Blood is kept in such Circulation. Sudden Chillinesses will also happen, which will as suddenly disappear, or remain for some little Space of Time, according as by such Inflammation some Part of the obstructed Viscidity, which is able to entangle the Heat for some Time, is broke away, and carried along in the Current to its Relodgment in the Capillaries. Nay, a continual Coldness may happen upon the extreme Parts, when the Blood which keeps on its Motion through the Arteries is reduced to so small a Quantity, as to receive an *Impetus* from the Heart, but very inconsiderable in Comparison to that which is otherwise required to wash out that *Lentor* from the capillary Arteries that obstructs them, and implicates the Heat from Action. The same Affection will likewise occur, whensoever the thinnest Parts of the Blood are mixed also with gross ones; for when these are arrived at the Capillaries, they will receive but very little *Impetus* from their Contractions, from whence they must stop; and if there they entangle the igneous Particles, a Cold will ensue without Remission, and continual, according as such Obstruction shall

shall sooner or later, or never be removed; and they will always be acted upon by a lesser *Impetus*, when even the thinner Blood is retarded in its Motion.

A *Lypiria* may be understood by the *A Lypiria*.
 Explanation of an *Epiala* in the *Twenty third Proposition*; nor is it necessary that it should have any other internal Inflammation for its Origin; the Blood, it is certain, may freely flow through the internal Arteries, without any Stop, as there always is in an Inflammation, whether it be with a large Tumour, which is called *Systrophica*, or without any sensible Swelling, when it is called a *Phlogosis*, or an *Erysipelas*. But a *Lypiria* will necessarily happen, whensoever the capillary Arteries in the extream Parts, and those especially which are external, are obstructed in such Manner, that by neither the Force of the Blood, and the intestine Motion of the obstructed Particles, such Stop can be removed; for the Blood in this Case will have such a Composition of Parts that are gross and viscid, and adhering to the external Capillaries, and of such as are thin and fluid, that although the former obstruct not sufficiently to raise a Tumour, or any Stop from Inflammation,

mation, yet there will be a great and a burning Heat inwardly, at the same Time that the external Parts are cold. The Pulse at this Time will be small by a Poverty of Blood, and quick by Reason of its Thinness and Activity, and the small *Impetus* with which it circulates will make the Pulse also a very short Time perceivable to the Touch; it will be unequal, and such Inequallity determined by the greater or lesser Quantity of Blood, or Spirits, and the stated or interrupted Times of the Auricles and Heart's Contractions.

A Lenta.

A Lenta or *Slow* Fever may proceed from any Causes commonly assigned, and in general from a Blood slightly vitiated, so that its Fault be permanent, or that the Cause first vitiating it may continue in Exertion; whether another Cause of like Kind immediately succeeds upon another Termination, either from Obstruction, or Putrifaction, or a Corruption of any of the *Viscera*, or from any other Origin of like Nature: The Fever cannot but be determined in its Affections and Height, according to the Nature and Efficacy of the vitiating Cause; when this therefore is slight, that will be so too, from whence it is possible

possible to be so favourably taken with this Fever, as hardly to know whether a Person ails with it or not: But yet the Tokens of this Fever are manifest in the Pulse and Urine, both of which will deviate from a natural State in many Circumstances, as already abundantly appears from what hath been said above concerning other Fevers. The Patient will manifestly grow weak, although the generating Cause is but slight, yet so far able to vitiate the Blood, that by its Heat and *Impetus*, somewhat is continually wasted, insomuch that the Patient is not proportionably recruited by Food; but hereby a Person may be more or less recruited, or seemingly not at all, as the Cause of the Distemper may be in this or that *Viscus*, that is, of greater or lesser Importance in the Elaboration of Nourishment, as in the Stomach, Mesentery, Liver, or in the Blood it self, from whence either the Juices conducing to Concoction may be derived in a distempered State, or if they are not so derived from it, the Chyle may be vitiated when it is passed into a vitiated Blood. A Patient then thus defrauded of Nourishment must grow lean, and waste by the Attrition of the vital Actions only,

so that according to the Diversity of the Fever, and the natural Constitution of the Patient, which is not reducible to any certain Standard, may he continue in this Condition 40 Days or longer.

The White
Fever.

Like unto this, both as to its Affections and Origin, is the *white* Fever of Virgins affected with a *Clorosis*, and the Fevers of *Cachectick* Persons; the former of which is from a Distemperature of the genital Parts, and the latter from Causes not much differing from those of a *Lenta*, which therefore want not any further Explanation here.

Symptoma-
tick Fevers,
from a Corrup-
tion of Milk,
or

There are also other *symptomack* Fevers, from a Corruption of Milk in the Stomachs of young Children and Infants, whence are generated viscid Humours, and a viscid Blood, disposed for the Production of Fevers; and as this Cause first subsists in the Stomach, many other Disorders may be occasioned, that by Content of Parts will give various Appearances, and cause crying, grating the Teeth, Convulsions, and many other Symptoms of like Nature, which may be easily followed by Death in such tender Bodies. Others arise from Crudity, which are like this in Children and Infants, in like

Crudity.

like Manner from Viscidities in their Stomachs, that is, when too much Food is crowded in at a Time, or that is not sufficiently comminuted by Mastication, for Want of Teeth at such an Age to perform it. Others again from a Derivation and Corruption of Blood out of the Vessels, as in Tumours and Bruises, &c. partly from the Pain, and partly from the Matter, which, when mixed with the Blood, will produce all the subsequent Affections, as it appears from the Nature of Inflammations, and of Fevers, as above explained.

*Extravasated
Blood.*

But there is yet somewhat more extraordinary in the Fever which arises from Worms, which therefore it is worth our while to be somewhat more particular about. Because then Worms are not naturally bred in the Stomach and Bowels, as often therefore as such Animals happen to be there produced, there must necessarily be somewhat more than natural in them, which is either the generating Matter of the Worms brought thither with the Food, or what is contained in, or derived into the Stomach and Intestines, is in such a distempered State as will change into such a Matter, able to produce Worms.

Worms.

If the generating Matter is derived from without the Body, at the first Production of a Worm there will be but little Inconveniency perceived, for there will then be neither any Fault in the Blood, or other Humours; but presently the Worm will begin to move it self, it will feed, and deposite its Excrements; for from the Anatomy of this Creature it is manifest all this must happen, they being furnished with Intestines, with Fæces, with a Mouth, and an Anus; from the Chyle then they will consume something, which may be of such a Nature as to leave the rest vitiated, and the Chyle will also be more certainly vitiated by a Mixture of the Excrements of the Worms in it; moreover these Animals will penetrate the Coats by their biting, or vellicate them by their creeping and sticking to them: And from this Perception alone will Disorders ensue of the whole Body; and first of all from this Sensation of Pain will there be occasioned manifold Reflexes of the Spirits without any Regularity or natural Order, from whence will arise *Deliria*; Disorders of the Imagination and Memory; Depravations of Sight, and Hearing; Watchings; grating the Teeth; Suck-
ing

ing the Lips; Vomiting; Crying in an unusual Manner, from the unnatural Motions made upon the Muscles of these Parts; hence also Peevishness, Restlessness, &c. from uneasy Sensations, and unnatural Reflexes of the Spirits in the Muscles, and more or less as those Causes are more or less aggravated.

And as by this Kind of Reflex we have already accounted for a Suppression of the Pulse, in a *Syncopalis*; from the Consent of the Stomach, it is manifest that from the same Cause, that is, a Pain from the Erosion, Adhætion, and creeping Motion of the Worms, the Pulse may be rendered small, obscure, unequal, weak, and deficient, as such Perception is more or less strong. But further, because the Motion of the Blood is diminished, in this greater Degree of Viscidity, it will come about that its more thick Parts will adhere in the Capillaries of the extream Parts, and there produce a Sense of Cold, such as is felt by Persons troubled with Worms, either continually or interruptedly. While therefore Worms remain in the Stomach and Bowels, the Blood will soon be vitiated by the same *Lentor* as produced them; inso-much that if any Thing can be separated

parated from the Blood by Sweat, that will be rendred Cold by the Coldness of the extream Parts; or it may also be rendred Cold by the Means before explained, and all those Affections will ensue which have been enumerated to belong to the Excretions, &c.

But all these Things will much more easily happen, if the generated Worms are supposed by their Feed and Excrements to vitiate the Chyle, or if the Chyle is vitiated before their Production, which is very common, as we are subject to breed Worms from eating too much Flesh, from Gluttony, and a Retention of peccant Humours too long, &c. and sometimes Worms that are very uncommon; when therefore the Chyle is thus vitiated, the Blood will be infected with it, and the more easily both from the Consent of the Stomach, and the Pain the Worms there occasion, and by such a vitiated Blood a Fever will be excited with all the above enumerated Affections.

Hence will arise fetid Steams, such as from Vinegar, or Acidities in the Stomach, and there fermenting; and such Humours will be retained in the Stomach, either because it cannot contract strongly enough to reject them by Means of these included Vermin, or because they make some Obstruction to

to their Ejection, or because from a vitiated Blood such Humours are continually supplied; and hence because these acid Vapours are continually ascending up the *Oesophagus*, to the Top of the Mouth and Nose, under the *Vomer*, there is continually an Inclination to rub the Nose, in Order to remove such Vellication and Disturbance.

The Pulse will be in Proportion to a diminished Quantity of Blood, joined to its vitiated Qualities, and a Sense of Pain.

There will be an Inappetency to Food, because that Sensation is not excited in the Stomach, as from Hunger; and a canine Appetite, when either the acid Humour, or some Effect of the Worms produce a Sensation in the Stomach, like to that of intense Hunger, the Body in the mean Time growing lean, because such depraved Humours cannot nourish it.

Great Quantities of Spittle will distil out of the Mouth, either because the sharp Humours in the Blood fuse it into such phlegmy Humidities, as are fittest for Separation by the salival Glands; or because such great Quantities of pituitous Humours are contained in the Stomach, that by the con-

continual Compression of the *Abdomen*, *Diaphragm*, and Muscles of the *Stomach*, some Part of them is thrown up thro' the *OEsophagus* into the Mouth, in the Appearance of Spittle: But that which is very wonderful is, that when even great Quantities of these Humours are thus thrown up into the Mouth, a Sense of Thirst will be felt, not only in all other Parts of the Body, but about the Mouth it self; that is, as often as the Humours so cast up, or drained into it, are subtle, dry, and vellicating. The Lips will be in this Circumstance dry or moist, as the *Saliva*, or any other moistening Humour is supplied to them, whether by Night, or in the Day-time; but because in the Day-time there is a greater Waste of Humidities by the Addition of a feverish Heat, and by the Transpiration, and Steams of sharp Particles which dry them; whence they are dry in the Day-time, and moister in the Night.

Oscitation, or Yawning, proceeds from Steams penetrating the Muscles of the Jaws and Mouth, or from Humours obstructing in their Interstices; from the same Kind of Lodgment also, whether it be from the Grosness of the Humours, or from a greater Pressure

sure upon the Fermentation of acid Humours, and their taking up thereby the more Space, arises Drowsiness: What more remains needs not Explanation.

Symptomack Fevers therefore are of the same Origin and Production, as the foregoing; for they all depend upon a Viscidity or *Lentor* in the Blood, while other Parts of it are at the same Time thinner than natural, or as it is possible, even in the Worm-Fever, from a vitiated Motion of the Blood; as from the Irritation of Worms, all those Affections may ensue, which are the known *Concomitants* of such a Fever; *Secondary* Fevers therefore are likewise to be comprehended under the same *Genus* as the others, and they have nothing in them different from what hath been already enumerated in the foregoing *Proposition*.



PROPOSITION XXX.

The Antecedents, Concomitants, and Consequences of the Small-Pox, do so vitiate the Blood in its Qualities, that from such Disorder does necessarily arise a Disorder also in its Motion and Quantity; and what this Fever is.

Antecedents,
how they operate.

Because a shooting in the Forehead and Temples proceeds from a more vehement *Impetus* of the Blood circulating out of the Arteries into the Veins, not suddenly, but retarded by some Stops in the Capillaries; therefore such a Pulse must proceed from the Blood increased in its Motion, or Quantity, or so vitiated in Quality, that a *Lentor* is produced which adheres in the Arteries and obstructs them. When therefore such a Pain as this comes without any previous Indisposition of the Body, or Passions of the Mind, which can augment the Motion of the Blood without any Fault in its Qualities; and nothing does

does precede, which can in like Manner increase the Blood's Quantity, but suddenly a Fever arises which breaks out into Erruptions, that conclude some Agitation and Change in the Blood; such a shooting Pain therefore does not come from an Augmentation of the Blood's Motion or Quantity, but from some *Lentor* obstructing its Course of Circulation, or from Rarefaction and Heat, which is equally an Impediment to its Progress in the Vessels, or from both together; or, which is the same thing, from some Fermentation of the Blood, whereby its thinner Parts are separated from its more gross, so that the more one rarefies, the more the other obstructs. From both these Causes will ensue great Doziness; for the more liquid Parts make Compression by their Rarefaction, and the more gross lodge in the Capillaries; by both which the Brain is so much compressed, that few or no Spirits can be generated and separated, from whence will appear a Resemblance to sleep. Hence also frightful Sleeps will happen; for the more liquid Parts of the Blood, which are at greatest Liberty to Motion, will increase in their *Momenta*, and as they fall into this or that Species excitable by such greater

Momenta,

Momenta, as frightful Appearances, such will be raised, and consequently the Sleep render'd disturbed and frightful.

From the same Origin will proceed *Deliria*; that is, whensoever the fused Part of the Blood exerts it self with too great an *Impetus*, so as to produce more vivid Spirits, which rapidly make Excursions on all Sides; or when a more vehement Perspiration has the same Effect upon the Blood; or a stronger Compression upon the Brain; or whensoever some, or all of these Causes subsist. Hence likewise arise Tumors and Convulsions, as it appears from what we have said concerning *particular Diseases*, and the Effects of a *Stimulus* on any Parts of the Body.

Sneezing proceeds from the *Stimulus* of a sharp Blood; as likewise stretching from the same *Stimulus* upon the Muscles; and both sneezing and stretching may be the Effect of the thicker Parts of the Blood giving uneasy Sensations, as we are accustomed to throw off every thing that is troublesome by shaking and moving the disturbed Parts.

Hoarseness arises either from the Pustules endeavouring to break out about the Throat, or by Viscidities furring

furring over those Parts, or by their too great Dryness from the Heat of the Fever, or from some or all of these Causes, whereby the internal Coats of the Wind-Pipe and adjacent Parts are rendered less smooth. A Cough is also an Effect of the same *Stimulus*, either from a Collection of Matter, or from a parching and velli-cating Heat.

Difficulty of Breathing comes from an Afflux partly of an hot, and partly of a thick Blood; by the former it comes about that the Lungs are more dried, and consequently more difficultly moved, because in such a Case they are both unfitter for Coincidence and Dilatation; and by the latter, is made, as it were, the Beginning of a Tumor, or an Obstruction within the Vessels; to remove both which troublesome Sensations we are accustomed more frequently to move the Breast, and with greater Force, which must resemble a more difficult Breathing; and without any such Custom or Endeavour, the Breast will likewise be more frequently agitated, and more strongly, from the *Stimulus*, and therefrom too a greater Difficulty of Respiration.

From the same Fervour of Blood, Heat and Redness, and a Sense of prick-

ing is perceived all over the Body; for the Heat extends it self to the extreamest Parts, because the *Lentor* in this Case is not so viscid, but more inclinable to Fermentation, and to set at Liberty its igneous Particles; and when the Blood also ferments, in Order to obtain more Room for its Motion, it distends the capillary Arteries, from which Distraction some Particles tinged with Blood will penetrate the Coats, and stain the Skin with a much higher Red. But the Sense of Pricking is from the same Heat, and a more compact Matter, endeavouring its Escape while it ferments, until at last it breaks out into such Pustules or Efflorescencies as in the Measles. And from these same Causes proceed great Anxiety and Inquietude, as frequently explained above.

From this same Acrimony will the Matter supplying Tears be more sharp, and therefore more irritating upon the Glands separating them; which Irritation will contract their Coats, and the sooner compress out that Humour derivable from the Blood, which is destined to be there secreted; and hence Tears will flow without any Inclination or Passion of the Mind, which customarily occasions Weeping; and

and this Effusion of Lymph from the lachrymal Glands will be also rendred the more easie from that Pressure that is in the adjacent Vessels, through which the Blood cannot readily flow, both by Means of the Rarefaction of its more fluid Parts, and the Obstruction of its more viscid ones; and from the Thinness of the Humour which is separable into Tears. But from the Nature of a fermenting and stimulating Blood, the Eyes will likewise ouze out somewhat mattery, and the hinder Parts of them will ake from the Straitness of the Vessels pulling them backwards into their Sockets, and which Straitness is the Result of a thick, or a sharp Blood, or a Blood abounding in both these Qualities; the Eyes will likewise sparkle, and shine by Means of the parching Heat, and the Subtilty of the Humours thrown into them, and giving a shining Transparency. The Countenance will be also red from the same Cause, as is assigned for it on other Parts; and therefore when the Blood comes there to stop, it will stretch the Vessels outwards, and occasion both the Eruption of Pustules, and the Intumescence accompanying them.

And this Fermentation and Change of Blood will be on a sudden, as if Nature had, through the whole precedent Course of Life, been endeavouring such a Change by slow and imperceptible Degrees, and to which at last, as soon as she hath arrived, the whole Strength of the Constitution is exerted to separate the Blood into gross and fluid Parts, or some partaking of both Natures; and thus a Fever comes to seize a Person on a sudden, like a *Synochus*, attended with all the Symptoms as in that, from the Beginning, to the Height of the Disease.

Concomi-
tants.

But by one, two, or more Returns, the whole Mass of Blood, and this Matter particularly in it, will be so far fermented, that it will not only make Efforts for Eruption, but actually break out into Pustules; the Matter therefore thus breaking out, will be either such as requires further Fermentation to get through the Cuticle, or such as is able to make its Escape by Perspiration, without any further Preparation; *that* will accumulate in large Parcels, as a great deal of Time is required before it can be rendred fluid, by Suppuration; but *this* will lie upon the Skin in lesser Portions, and cover it only with a Kind of Scurff;

Scurff; as it is not only much thinner in Consistence, but also by its Smallness in Quantity it penetrates the Membranes, whereby it does not rise into Eminencies and Tumours; and for the same Reason, they are disscussed without Separation in a short Time; that is, in about five Days. And these Eruptions may, and ought to break out with great Redness, because it is the most thin and subtle Part of the Blood that settles upon the Place of Eruption, and by its Fermentation there, the most subtle and thin Parts only come into Sight. For the same Reason also the larger Pustules appear with Redness and Inflammation, whence the *Small-Pox*, that is, these larger Pustules, ferment and come to Suppuration; the other are the *Measles*, and so called. But these also may change into other Colours by various Circumstances and Accidents, as it abundantly is manifest from what hath been already explained in the *Twenty first Proposition*, concerning a *malignant* Fever.

If this Change in the Blood's natural Cohæsion is moderate, and nothing is forced from it that is very thin and active, but somewhat only that is fluxile, yet mixed at the same Time with Viscidity, Aquosity, and Phlegm, the

Pustules which break out will be whitish Vesicles, full of a ferous Humour, which in a short Space will break and dry away, in three Days perhaps; and in this Case there will be no Danger, for such may rise even without a Fever. And these Pustules will break either by too great a Distention from the included Matter, or from the Rarefaction of its fermenting Qualities; and they will dry away, because there is no Supply of Moisture to preserve them.

When, again, these Pustules are red, they must therefore contain a Matter not far deviated from the Nature of real Blood, and on that Account will they be the less dangerous.

When they are white, the contained Matter will approach the nearer to the Nature of Phlegm or Lymph, that is, somewhat of very little Energy, and therefore unapt to ferment or corrupt, and consequently of a good Indication.

If they are soft, they are from a less obstinate Viscidity, that cannot raise a very aggravated Fever, but easily suppurates, and is attended with no Danger.

When they are few in Number, it is an Argument that the generating
Visci.

Viscidities is but small in Quantity; that is, supposing all that ought to come out is so; and not only Part of it, and that too which is most fluxile, leaving the thicker and more mischievous behind; and therefore when the *Small Pox* are thin, it is a good Sign.

Further, When the Pustules are distinct, it is a Proof that the peccant Humour does not abound, which it is necessary to do in Order to thrust more out, and thicken them, as is hereafter to be proved.

When they are round, it is a Demonstration that the Matter filling them is ductile, and resolvable by Fermentation, whereby it is capable of being lifted up into a more elevated Form, and accommodating it self to the Figure most natural to any Fluid of an equable Consistence. And in all these Circumstances of the *Small-Pox*, there easily is a healthful Termination, and a thorough Recovery.

When these Pustules break out only upon the Surface, then the *Ichor* upon breaking them, or the Matter, if they are suppurated into little Ulcers, will only spend it self upon the outward Parts, nor will reach to any Part of Moment, nor be mixed with the Chyle,

or Blood, whence there will be no Danger: But when these Pustules rise in the *OEsophagus*, Stomach, or upon any *Viscus*, whether they suppurate, or break before, the *Ichor* or *Pus* will generate little Sores, nay sometimes Ulcers of some Bigness, upon one internal Part or another, and will mix with the Chyle and Blood, so as to give Rise to other kinds of Fevers, and many other Diseases; and therefore must the *Small-Pox* rising inwardly be attended with much Hazard: For this Eruption upon the *Viscera* argues a great Obstinacy in the *Lentor*, that cannot be broke, and render'd fluid by the internal Heat.

When a slight Fever preceeds the Eruption, or ceases upon the Eruption, or is much lessen'd, it proves the Quantity of Humour to be either expell'd, or small and mild in its Qualities; and therefore in this Circumstance a Recovery may be safely prognosticated; and the more so likewise, when all other Symptoms are proportionably favourable, particularly the Voice clear, and Respiration easy; for the Clearness of the Voice shews that no Pustules are about the Passage of the Breath, as the Breast, Wind-Pipe, and Throat; and an easy Respiration

tion proves that the peccant Humours flow easily through the Lungs, that they can easily be concocted without any further Fusion of the Blood; that is, that they are not much degenerated from a natural State.

But suppose the Pustules break out slowly, it is a Proof that the peccant Matter is obstinate, and not easily yielding to Fermentation and Solution, whence its Continuance in the Blood will be long; that its Adhæſion to the Arteries will be very great; that it will contaminate the whole Maſs; and bring the Life into Danger.

When they are many in Number, it argues an abundance of peccant Matter, which by the Greatness of its Quantity cannot be easily and wholly detached away by the Skin; when they are large, or double, or confluent, it is a Sign also of the same Exceſs of peccant Matter.

When they are depressed, the Matter difficultly ferments, and hath not Energy enough to diſtract the Membranes, and raise them into Pustules of greater Eminence; which proves it to be very viſcid, and hard to be diſſolved, whence the same Hazard.

When the Pustules are hard, it is a Sign of the same Tenacity in the peccant Matter,

Matter, and its Difficulty to Solution.

In Case they are green, livid, black, and less transparent, they then must be raised by Matter that is tough and hard, and which, before it can be dissolved, will cause the whole Mass of Blood to be brought into Fusion, and consequently perverted in the highest Degree from its natural State; but if it cannot be dissolved, it will then remain in the Blood, so as to occasion great Hazard.

But because the Membrane which incloses a Pustule is the most distracted and tense all round at its *Base*, therefore at the Tip or Point it will be more yielding, and give less Resistance to any evaporating Humour, while the other Parts of its Circumference are more hard and compact, and consequently less perspirable, and more compressing the contained *Lentor*, than at the *Vertex*; so that the whole *Nisus* of Expiration will be at the *Vertex* of the Pustule; while therefore the Matter ferments and perspires at the *Vertex*, whither its whole *Nisus* is inclined, there appears a Blackness, although all the rest of it is of a well conditioned Colour; such Blackness must be from somewhat collecting at the
Point

Point of the Pustule; but this which gathers at the Top is most thin, that is, most capable of Perspiration; and consequently what Part of it sticks in a Place most transpirable, must be least fluid, and obstinate, and easily reducing the Blood into a State most remote from what is natural; and therefore put the Life into great Hazard.

The Reason and Necessity of Danger is not much unlike from a Mixture of Purple-spots in the Interstices of Pustules that are better coloured, and which Spots will be yet of a much more fatal Importance when they prove livid or black, as it appears from what hath been already said in the *Twenty first Proposition* concerning a *malignant* Fever.

But when the Pustules disappear immediately upon their first Eruption, and the Matter cannot be evaporated, or suppurated, whereupon it regurgitates into the Mass of Blood; or when it can evaporate, or suppurate, if such Procedure is stopped, while some remain yet in the Blood, there must subsist some Cause that can put a Stop to such Procedure, and which as it cannot be supposed any thing external, it must be somewhat intrinsically in the
the

the Blood, and coagulating it into a yet greater *Lentor*, which cannot be thrown off towards the Skin, and must therefore yet more contaminate the Blood, or obstruct the Vessels, or do both.

The necessary Consequences of these Affections will be black Urine, or black Stools, separated from a Blood that is wholly fermented, and coagulated into *Lentors* difficult to move; or from a Mixture of Blood from an Erosion of the Vessels by the acrid Humours; or their Disruption from obstinate Obstructions; or from pure Blood venting it self by its Acrimony; or the Compression of neighbouring Obstruction. And for this Reason an Hemorrhage at any Part is dangerous, and especially after a Suppression of the Pustules, and from the same Causes already enumerated concerning the Excrements of the Intestines, and the Urine.

Where the Fever is great, it is an Argument of a great deal of Matter to be thrown out in Pustules, and consequently dangerous; and when it does not yet sink upon their Eruption, it is a further Proof that a great deal more yet remains in the Blood to be thrown out, which therefore may so change the
the

the Blood, as to continue the Fever; that is, it will be changed into a State as remote as possible from a natural one, and very easily passing into a total Obstruction, that is, Death. What remains is it self manifest; and therefore the whole *Proposition* is true.

The *Small-Pox* therefore is a Fault in the Quality of the Blood, whereby it loses its natural Cohæsions, and becomes both more thick and more fluid, whence the whole Series of Affections before enumerated are produced, and from a Collection of which is constituted that Fever, which is called the *Small-Pox*.

PROPOSITION XXXI.

The Antecedents to a Periodick intermitting Quotidian, may change the Blood in its Motion, Quantity, or Quality; but its Concomitants and Consequences are the necessary Result of its vitiated Qualities: and what this Fever is.

All that now remains to be explained concerning Fevers, requires but very little

little Trouble; for what we have already explained in the foregoing and general *Propositions*, premised to *periodick Fevers*, as well as in those very *Propositions* themselves, do naturally demonstrate all that belongs to any other Kinds of intermitting Fevers. And indeed as the *Antecedents* to an *intermitting Periodick Quotidian*, are the same as to a *continued Quotidian*, it is manifest that the same Effects will be produced by them as in a *continued Quotidian*; and that the Affections of an *Intermittent* arise from the same Causes as those of a *Continuent*; and further, that as those of a *Continuent* proceed from a *Lentor* of the Blood, or its vitiated Qualities, after the like Manner they are produced in an *Intermittent* from the same Causes.

Antecedents. Those *Antecedents* therefore which we have enumerated to belong to a *continued Quotidian*, and agree with the *Antecedents* to an *Intermittent*, are not worth our while to explain here over again: The diminished Warmth of the *Viscera* is reducible to a moist Constitution; a cold and moist Diet, to the Condition of Children who suck, or want Teeth, and to a Surfeit; a Corpulency of Body, to a viscid State of Blood; and a pale Complexion is always

ways a certain Sign that the Blood is destitute in a great Measure of its florid Parts, or of whatsoever should raise its Colour, and consequently abounds with phlegmy and cold Humours; a Straitness or Narrowness of the Arteries checks the Blood's *Impetus*, and retards its Solution, whence it is rendred colder, thicker, and more phlegmy; much Sleep, especially after Eating, is also reckoned amongst the *Antecedents*, because it favours the Lodgment of all the Humidities of the Food upon the Parts, as for Want of Motion they are not separated from the Blood, and dissipated by Perspiration, which they otherwise would be for the greatest Part.

Many of the *Concomitants* are so easie ^{Concomitants.} to be understood, that they want not Explanation; for in such a Constitution of Blood, as here supposed, that *Mucus* or Viscidity of the Blood will easily be generated; that is, such an one as will entangle the igneous Particles, and adhere in such Manner to the capillary Arteries, that by the continual Afflux of succeeding Blood, and the natural *Nisus* of the Particles contained in the *Lentor*, it may be wholly washed away, and carried into the Veins, so as to return again in any given Space of Time,

Time, and which Experience hath taught us to be about 24 Hours; and when nothing of it remains in the Arteries, the Body will be left entirely free between every Paroxysm: And because while some Part, or all, of this *Lentor* is wearing away from the Capillaries, it may be expelled either by Urine or Sweat, the Patient therefore will discover it by both; in like Manner also may some Part of it be thrown off by Stool, by Vomiting, and any other Ways, according as it is suited for the Excretion of any particular Glands, or Emunctories. If indeed it cannot be separated in the first Day, neither Sweat nor Urine will be affected by it; yet after many repeated Circuits the *Lentor* will be more subdued, and rendred fluxile; and during this Time, the Urine will be pale, crude, and thin, because the earthy and grosser Parts are not yet enough in Separation to be strained along with it in the Kidneys. Its Attacks will be with a slight Cold, because of its Entanglement of the igneous Particles, and the Heat will with Difficulty break into Liberty, both because there is but little of it in such a cold Constitution, and because there is but little Motion and Agitation, &c. all which is
mani-

manifest at first View. All Things will happen likewise in the same Manner, if the *Lentor* of the first Fit is wholly consumed, and at the End of one Day another *Lentor* is generated of the same Nature, and thrown again after the same Manner into the Capillaries; as is manifest from the preceding Demonstrations.

But if this Fever be longer protracted- Consequen-
ed, so that the Humours and whole ces.
Habit are vitiated, insomuch that neither natural Juices can be generated, nor their Apposition for the Nourishment of the Body be performed, then there will ensue a *Cachexy*; where so much Water abounds, that it ouzes through the Vessels, there will be generated a true *Dropisie*, whether the Veins or Lymphaticks are so compressed by the Tumours of any Parts, so that their Lymph is squeezed through them, or the Lymphaticks by such Compression are quite broke; in which Case not only a *Dropisie*, but likewise a *Carus*, or a *Lethargy* may follow from the Lodgment or Accumulation of so much watery Humours upon the Brain.

A *Periodick intermitting Quotidian* is then a Fault in the Quality of the Blood, wherein a *Lentor* capable of entangling its igneous Particles is accumulated in the capillary Arteries, but

again entirely washed away; whereupon if the whole be consumed, a like *Lentor* is generated in the Space of one Day, or derived from some other Part, to be again obstructed in the Capillaries; which again is wholly wasted or not, and recurs every 24 Hours with all its *concomitant* Affections.

PROPOSITION XXXII.

The Antecedents to a Periodick intermitting Tertian, may vitiate the Blood in Motion, Quantity, or Quality; but its Concomitants and Consequences are the necessary Result only of its vitiated Qualities: and what this Fever is.

Antecedents.

With like Ease is this Proposition demonstrated as the former; for the *Antecedents* to an *intermitting Tertian* are the same as to a *Continuent*, whence from the like Cause are the same Effects, and Necessity of Production; so that it is not needful to explain them again particularly here, as it is already manifest how they can vitiate the Blood in its Motion, Quantity, or Quality, although

although its vitiated Quality only is the necessary Cause of all its Affections, and which vitiated Quality is nothing else than a *Lentor* produced from its *Antecedents*.

But here it is requisite to observe with Relation to *Intermittents*, that when the *Lentor* is of one Kind only, that is, altogether pituitous, (to use the old Terms) or bilious, or melancholy, there will be generated *legitimate Intermittents*; but when the *Lentors* are from some Cause or other not thus simple, but compounded with one another, then are produced *ipurious Tertians, Quotidians, and Quartans*. It is also further to be remarked, that as often as it is asserted that the *Antecedents* to *Intermittents* are the same as the *Antecedents* to *Continuents*, and consequently that the *Concomitant* and *Subsequent* Affections are necessarily the same, it is not to be understood with the utmost Restriction; for they are pronounced the same only in Kind, and not in Degree of Efficacy; thus Age occasions Cold and dry Juices, and thereby changes the Blood into a *Lentor*, and on that Account Age will produce the Requisites to an *intermitting* or a *continued* Fever; but because the Dryness may be greater in one Body than in another, and therefore the

Lentor generated in one will be dryer than in another; that is, more adhering to the Arteries, and more entangling the Heat, so that in such an one will be produced a *continued Quotidian*; but in another, where the *Lentor* less adheres to the Arteries, and less restrains the Heat's Activity, although it be from the same common Cause, Age, but differing in Degree of Operation, it will produce an *intermitting Quotidian*, and so of the rest.

Concomi-
tants.

Let it then be supposed that from the same *Antecedents* is produced a *Lentor* in the Blood, more dry than that of a *Quotidian*, but such as is capable of Protrusion through the Arteries, and of more strongly entangling the Heat; the Cold then will be intense; and as somewhat is joined with the *Lentor*, which is also at the same Time stimulating, with the Perception of Cold will be joined a Perception also of pricking; but when the *Lentor* is got through the Capillaries, the Cold will go off. And further, if this *Lentor* is not consumed, nor either Sweat or Urine succeeds, as it is supposed dryer than the *Lentor* washed into the Veins in a *Quotidian*; it will re-accumulate in the Arteries more slowly, as Experience teaches us that the Time of its Return is in about

about three Days: But it may yet be wasted without any sensible Discovery of it in the Secretions, which is also true of the *Lentors* producing a *Quotidian*, and a *Quartan*, that is, when it is digested into perspirable Matter. Although when it does not perspire, and it is so dissolved that it is brought by the Blood's Current to the secretory Glands, without any further Adhæſion in the Capillaries, it will then be strained off by those Glands with their common Excrements; after which, if no new *Lentor* is generated in the Arteries, the Patient will be quite recovered; but if another *Lentor* of the same Kind be produced then, it will prove a *Periodick intermitting Quotidian*; because the *Lentor*, during such a certain Space, is wholly carried away, and leaves the Body in entire Health. And these with all other Circumstances ranked amongst the *Concomitants*, abundantly appear from what hath already been explained.

When the Urine hath in it a pale Cloud, at the Beginning of this Fever, or what is called an *Eneorema*, it shews that some Part of the *Lentor* which is most solvable, is mixed therewith in very small Divisions, that is, in Particles that are most susceptible of Motion, and of very weak Cohæſion, which is

the Cause of its Solution so soon, in the Beginning of the Fever; wherefore if Nature does not desist from this Procedure, but continues the Solution, the *Lentor* will in a little Time be wholly dissolved, and which is commonly finished by the fourth Fit; but that does not always necessarily happen. When the Urine is red, it discovers that the hard Particles abound in an over-Proportion to the Humidities in a natural Quantity, or that the Humidities have not their natural Proportion to the rigid Particles in due Quantity.

The more gross Particles of the Urine abounding in Quantity greater than natural, shew the *Lentor* to be dry, copious, and difficult of Solution, which will protract the Fever to a longer Space; but a Proportion of Humidity less than natural argues a great Degree of Heat, which wastes it, and renders the *Lentor* more tenacious, that is, less dissolvable, which will also protract the Fever; or the *Lentor* may in it self be so conditioned, as to implicate and entangle that Humidity, which otherwise would wash away by Urine.

When the Urine is without a Cloud, or an *Eneorema*, it discovers that no Part of the *Lentor* is broke away, and consequently that it is of such a tough Consistence, as will not easily yield to Solution,
but

but will therefore protract the Distemper. And when this happens, we experience the Fever to last to the seventh Fit, although it does not always necessarily follow that it should then finally terminate.

But because the Sediment in the Urine is the most rigid or gross Parts, and its Levity and Equality depends upon an equal and perfect Solution of the same Matter, that Urine therefore which lightly and equally subsides the first Day of the Distemper, shews that the most rigid Particles which are the Cause of the Disease are already dissolved, or in Readiness so to be, and therefore that the Disease will soon terminate. And where therefore this happens, even in a *Tertian*, it will not long continue, but commonly finish its Course with the third Fit.

This *Lentor* will also break away, and lodge in Eruptions about the Nose and Lips, either because it is changed into somewhat near to the Nature of the *Saliva*, and consequently most separable by those Glands; or for the same Reason as was before assigned for the Eruption of Pustules rather about the Hands, Feet, and Face, than on the Breast or Back.

It appears from the *general Propositions*, ^{Consequences.} that *Intermittents* are not without some Hazard; and a *spurious Tertian* will

succeed, when the *Lentor* that is genuine and equable, is mixed with a new generated *Lentor* of a different Kind, or is in Part changed. Wherefore the whole is demonstrated.

A *Periodick intermitting Tertian* therefore is a Fault in the Quality of the Blood, wherein there is generated a *Lentor* more tenacious than that of a *Quotidian*, apt to entangle the Heat, and adhere to the capillary Arteries, yet so that it may be wholly washed away, and recur again every third Day; and this will be either wholly wasted in every Paroxysm, and generated afresh, or partly wasted and joined by a new one, every third Day recurring, which will produce all the enumerated Affections.

PROPOSITION XXXIII.

The Antecedents to a Periodick intermitting Quartan, may vitiate the Blood in its Motion, Quantity, or Quality; but its Concomitants and Consequences do necessarily depend only on its vitiated Qualities: and what this Fever is.

Antecedents. We may very soon dispatch this Head; for the *Antecedents* are the same
as

as those to a *continued Quartan*, and therefore may be understood from what hath been explained concerning them; and what are further enumerated under this Distinction are very plain, both in themselves and from the foregoing Demonstrations. For by them is produced a *Lentor* cold and dry, and much more incapable of Motion in Comparison to the *Lentors* which make a *Quotidian* or a *Tertian*; but yet such an one as can be wholly washed out of the Capillaries, after it hath some time adhered therein.

This therefore must be more gross in its constituent Particles, from whence, when it is lodged upon the Muscles, it either stimulates them to their natural Contractions, or gives such a Sense of Uneasiness, that we endeavour voluntarily to move them; hence when it comes first to settle, and a less Quantity only is lodged, it does not occasion any Sensation of greater Uneasiness than what incites to yawning and stretching; then we perceive somewhat restless and troublesome unequally spreading all over the Body, which must be Portions of *Lentor* accumulating in this or that Part without any certain Order; and to this Sensation soon follows that of Cold, as the viscid Matter gradually collects in the Capillaries, and flows through the Arteries but slowly, until it

it is all gathered upon their Extremities when the Sense of Cold appears very great; and it will be also accompanied with a Weight, and an Appearance of Contusions of the Bones themselves, as is manifest from the *general Propositions*. But from hence it will gradually be wore away, and by Means of its natural Coldness give some Restraint to the Activity of the igneous Particles, wherefore the Heat will even then be remiss, because it cannot by a slight Compressive Force be extricated from such cold and solid *Molecule*. The other *Concomitants* appear from what hath been already said, and the Paroxysms return but every fourth Day by Means of a *Lentor* which moves very slowly.

Consequen-
ces.

Consequent to these Circumstances succeeds a short *Dysentery*, that carries off the whole Quantity of *Lentor*; and this will be the more salutary the shorter it is: For when it is of long Continuance, although it be supposed to carry off all the *Lentor*, and is a Sign of a thorough Fusion in the Blood, yet it may happen to carry off so much Humidity, as to leave the Mass of Blood very dry, whence will arise many Disorders, and such as may bring the Life of the Patient into great Hazards. And for this very Reason, *Lienosis difficultas Intestinorum, bonum*; that is, supposing it short,

short, as we have already taken Notice, and as manifestly appears from that other Passage of *Hippocrates*, *Qui lienosi difficultate Intestinorum corripuntur, is longam supervenientem Dysenteriam aquæ inter cutem, tum levitas Intestinorum excipit, & moriuntur.* Where it is plain that a long *Dysentery* is bad, and that such are afterwards subject to a *Dropfy* from that Dryness, which hinders the Circulation of Lymph, by the Contraction and Closeness of the Vessels; or else Death necessarily succeeds from the same Quality of the Coats of the Intestines, whereby the Apertures of the Lacteals are shut up. A *Dropfie* is therefore a *Consequence* by Means of such Dryness; and a *Scurvy* from this Distemperature of the Humours, especially where there is a Fault in the *Viscera* preparing them.

It is fatal to old People, especially those above Sixty; because at such an Age there is the greatest Degree of Coldness and Dryness, which therefore being aggravated by the Assistance of a Disease that is hot and dry, must bring it to an Extremity, and the Patient will die.

But if it be changed into a *Continuent*, it will yet be fatal, because that will be the Effect of an aggravated Dryness, wherein the Blood will be yet more fused, from the obstinate Adhesion of the

the *Lentor*, and its greater Remove from a natural State.

An Hemorrhage at Nose will be in like Manner dangerous; either from the Acrimony of the Blood breaking through the Vessels by its Erosion, or from its grossness forcing them asunder by Compression; when it obstructs upon the same Vessels, it bursts, or those nearest to them. For such Erosion will be attended with a Dryness, and many other Inconveniences, and a thick Blood, which loads and presses upon the Vessels, will with the most Difficulty be reduced to its natural State. If therefore by this *Lentor* the Blood is so vitiated, that no good Juice can be contained in it, nor added to the Nourishment of the Parts, the Body must become lean, and fall into a *Cachexy*. And therefore the whole *Proposition* is demonstrated.

A *periodick intermitting Quartan* then is a Fault in the Blood, wherein a certain *Lentor* is produced that is fitted to entangle the Heat, and adhere in the Arteries, but may be wholly carry'd out of them again, and recur every fourth Day, &c. as above.

PROPOSITION XXXIV.

Of a Semitertian and Erratick Fever.

From what hath been demonstrated ^{A Semiter-} at the Close of the *Nineteenth Proposition*,^{tian} it appears that some Kinds of an *Intermittent* may be joined with a *continued Periodick Fever*, although *that* is produced by a *Lentor* which adheres to the Arteries for some Time, and is again wholly washed away, and *this* from a *Lentor* continually residing in them; and therefore from the same *Proposition* it appears what a *Semitertian* is, and how it is produced, that is to say, a Fever compounded of a *continued Quotidian* and an *intermitting Tertian*. In this then the Returns will be with Cold every third Day; and the like may oftener happen, as that *Lentor* which confines the Heat recurs with Uncertainty; and hence the frequency of the Returns is easy enough to be conceived, because such a Composition of two Fevers, proceeding from two *Lentors*, argues the Blood to be greatly vitiated, and as it were turbid, in some Parts fluid, and in others viscid, like to that Constitution of Blood which we have described in a *malignant Fever*.
Hence

Hence it comes to pass that this Kind of Fever is of all the most dangerous, the Blood being greatly perverted from its natural State, and every where depositing such *Lentors* as are the Origin of very sudden and fatal Evils. The Mouth of the Stomach is affected by the Derivation of distemper'd Juices to it; Disorders of the Head, and consequently of the whole nervous System, are produced by an Accumulation of *Lentors* compressing it, and causing a disorderly Generation and Derivation of Spirits; Syncopies are produced either by Consent from the Stomach, or immediately, as appears from *particular Diseases*, and a *Syncopalis*; a *Diaphoresis* from Compression or Fermentation, by Obstruction or Heat; Thirst, and an inward Uneasiness from Heat, from Irritation of the most fluid Parts, and from an over stock of Spirits breaking forth with great *Impetus* against obstructed Parts.

Erratick Fevers.

Erratick Fevers appear from their *Antecedents* to be produced from different *Lentors*, recurring at different Times, in no Order or Certainty, as is confirmed by their *Concomitants*, if they are compared with what hath been already explained, and are considered according to their own Necessity of Operation. But because by *Lentors* of this kind pro-

producing a Fever and its Returns, it is necessary that the Blood, continually agitated by an unnatural Heat, should lose all its Humidity, it must become very dry, that is, disposed to produce a *Lentor* generating a *Quartan*; in which it will at length settle, if the Heat is not so great as to overcome the Cold; and hence it comes about that a *Quartan* is apt to succeed *Erratick* Fevers; but an *Hectick* will succeed when the Heat predominates.

It hence therefore appears, that no Kinds of Fevers can be generated from a *Semitertian*, or *Erraticks*, that is not comprehended in some of the preceding Divisions, or that depends upon any other Causes than the *Lentors* above explained, and therefore that they are to be included under, and defined by them. But from the *Eighteenth*, *Nineteenth*, *Twentieth*, and *Twenty first Propositions*, it doth not only appear, that all those *Antecedents*, *Concomitants*, and *Consequences* of Fevers, which we have enumerated from the Relations and Methods of others, may continually occur in Practice to a diligent Attention, but also their Orders of Invasion and Change, with many other Particulars.

PROPOSITION XXXV.

A Fever is a Fault in the Blood's Motion, Quantity, or Quality, or in some or all of them.

Because then there is no Fever producible besides the forementioned, or because if there can be any other, it is reducible to those; and that every one of them is a Fault of the Blood in its Motion, Quantity, or Quality; therefore a Fever is nothing else than this Fault of the Blood either in its Motion, Quantity, or Quality, whether some or all of these primarily happen, in some or all Kinds, which was to be demonstrated.

From these may innumerable *Corollaries* be deduced, which every one may do for himself, &c.

F I N I S.



