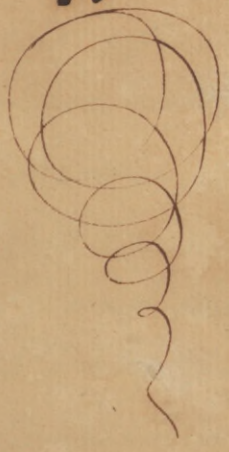
For photostat of a Cullen letter see Kilgour correspondence, Spring, 1949.

The
Institutions
of Medecine by
Dr. Cullen —
Oct. 28th
1772. —



Lect. 1st —

We come here now Gentlemen to announce my entering upon a course of Lectures for delivering the institutions of Medecine. I would wish earnestly however to be understood, that in entering upon this course I am to enter upon delivering a complete and entire System of Physic. This System has been commonly and equally divided into two courses, the one of the Institutions, and the other of the Practice, and that by two different Professors; and in this case there was no certainty of making one entire System; but, as we have now altered our measures in this respect, and the same Professors continue to deliver the one after the other, the beginning of this Course will be the beginning of a complete System of Physic, making one coherent and consistent whole.

But tho' I would wish to have it viewed in this light, that every part of our two years work should be considered as equally necessary to the whole yet some may be supposed to think that the Course of Institutions the Theory, is perhaps not at all necessary

or

or at least less so. with such I shall not enter into any dispute at present, but when proper I undertake to prove that the Institutions as I shall deliver them are not a Theory in the common sense of that term but are necessary to every possible Scheme of practice, and are as applicable to the cure of diseases as the Course of practice itself, but I must say no more of this at present, But

I propose to explain a few particulars with regard to the conduct of the Course of Institutions I am presently to enter upon. I have been long persuaded that the time allotted to this Course, is by a great deal too short, and I have never been able to finish a Course without extending the time of it beyond the usual limits, and even then I omitted some things that I wished to have mentioned, and abridged others that I would have willingly enlarged, but it cannot be extended further. & I must accommodate myself to the time prescribed by Professors and Pupils, but I find no other means

of

of doing this, than by omitting some parts that are less necessary and abridging others that can be more shortly delivered, I have done this but not hitherto with the wished for success, but I hope to do better now. and you may for this season depend upon it that I shall complete my course by the last day of April next.

With regard to my general plan this season, the Institutions consist of three parts, I suppose every body knows so much of Physiology, Pathology & Therapeutics. The Physiology comes first necessary, and it has always in every course had the largest share. The late celebrated Dr. Boerhaave bestowed six months upon the Physiology, and hardly two months upon the other two, his close followers in this university for a long time managed in the same manner, and I must be allowed to say that I was the first who give any tolerable share to the Pathology and the Therapeutics, With regard to the Sayden distribution, as I may call it, I do not say that any thing superfluous was

delivered

delivered, nay every thing was just & right, but agt. part of it was by no means so neces-sary, and it should not in some measure have thrust out these altogether. I for my part am persuaded that in Institutions that are a proper introduction to practice it is necessary that the Pathology and Therapeutics should have a due, that is, a large share of our time but I must say this plan is not easily executed, the Physiology is necessarily an extensive subject, it is not enough for us to learn what is clear and certain in it, but we must necessarily be informed of the many opinions, &, I may say, Errors which have formerly and do still prevail in the writings and minds of Physicians, and we ought to know not only what is at present ap-plicable to use, but we ought to prosecute the matter further in order to obtain hereaf-ter somewhat more complete and extensively useful, therefore I must own that the abridging the Physiology is not very easy nor perhaps very desireable, yet the necessity of our subject obliges me to attempt it.

it, and I am resolved to give a larger share of my time to the Pathology and Therapeutics than I have formerly done; but inorder to that I must abridge the other part, but with this view inorder to shew the application of it in the Pathology. Several professors have been of opinion that the Physiology and the Pathology should be taught together, and I think it is very proper in several Cases, but I have not found it possible to do so throughout, but I shall frequently join them together as the method I think best for exercising you in both parts of the Science. That I may abridge the Physiology with more safety, I have considerably enlarged the text for it, and I also hope to give you some assistance in print for the other part of my Course. Besides my own text book the only books I would recommend to you during the Course are Dr. Haller's prima Lineæ & Elementa Physiologæ & the Patholo-gia Medicinalis of Dr. Gaubius

I conclude at present, and I hope it is not necessary to solicit your atten-

tion

attention, I hope also that my by past con-
-duct will make it unnecessary for me to say
that I will give you the best and fullest
Instructions I can, we shall meet to pro-
-ceed on our course on monday next

Lect.r 2 —

I come here now to enter upon a —
Course of Lectures for delivering the Ins-
-titutions of Medecine or more properly
I am to enter upon delivering a compleat
System of Physic, which may be supposed
to prove tho finished only in the course of
two years, one coherent and consistent whole.
But I cannot enter upon any part of our
business to day, I must therefore enter-
-tain you with the usual Introduction
to our course, i.e. to give you a short acct.
of the History of Physic at different times,
a full and curious enquiry into this
Subject is absolutely necessary to every
one of you that would acquire a tolerable
stock of medical erudition, and I shall
recommend it, when you are properly
prepared for it, but I can't suppose any
great number of you so prepared at

pres.t

present, and therefore I propose only to give you a very general view of it, but such however as you may at present understand, and such as may lay a foundation for your after pursuits upon this subject. What I propose then now is to give a short account of yt. I think may be called the revolutions of Physic considered as a branch of Literature, i.e. a general account of the changes that have happened in the method of Cultivating the Art, with the effects of these changes so far as history will allow us to go.

For this purpose I mark seven points of time, at each of which I suppose a considerable revolution to have happened, and in every different revolution or period of which I suppose the art to have been in a different state and condition with regard to the manner of prosecuting it, —— The first period extends from the first beginnings of the art till the time that Philosophy was formally introduced into the Schools of Physic, during this period the art was

cultivated

cultivated by experience and observation almost alone and the first revolution was from the joining Physiography and Theory to experience, and the persons who produced this change, when distinguished as a sect, were called Dogmatists —— The 2d period extends from the time that practical Physicians attempted to lay the foundation of their Art in reasoning concerning the human body, till the time that a sect of Physicians arose who opposed all reasoning in Physic, and declared against Philosophy and Anatomy as the foundation of it, declaring that experience was the only guide; the Physicians of this sect were called empirics: in this period all the celebrated Physicians were purely Dogmatists, and if there were any number that were really empirics, they were accidentally not professedly so. —— The third period extends from the rise of the Empirics to the rise of the methodic sect, which was distinguished by a modification or abridgement of Dogmatism; and it was during this period that the proper empirics

appeared

appeared, but it was not with the effect of
suppressing the various Schools of Dogmatists
that had been formerly established. ——
The 5 period extends from the rise of the
Methodic Sect to the rise of Galen by
whom the 6th the methodics and Empirics were
suppressed, and the antient Dogmatism
restored. During this period Physic was
divided among Dogmatists. Empirics
and methodics but the last was still the
most prevailing sect, at least where it had
arisen. —— The next period extends from
Galen to the introduction of Chemistry
into the Schools of Physic. During this long
period the System of Galen had almost alone
prevailed, but now not only a new mode of
Dogmatism was introduced, but an occasion
was given to much empiricism. —— The
6 period extends from the introduction
of Chemistry to the discovery of the Cir-
-culation of the Blood, which event in a
discerning age promised a more certain
& durable foundation for Dogmatism
than had been laid at any time before
During this period Physicians were divid-

ed

divided between the two Sects of Galenists & Chymists. The Chemists were pretendedly Dogmatists, but were for the most part truly Empirics; and the Profest Dogmatists did not reject experience, but they made little use of it. —— The 7th and last period extends from the time of the Discovery of the Circulation of the Blood to the present Day. During the last period Physic has been constantly taught upon a Dogmé plan, but has been more commonly practised upon an empiric. But we shall have an occasion to explain all these particulars more fully hereafter. This Gentlemen is a general Idea of the history of Physic, and I intend that you should take this general Idea very fully in order that you should understand the plan I am to follow, and the divisions of it, by which you will understand what I am to deliver and will be able to recollect it more clearly. In this and at every after period of my course I shall think myself happy if I can follow such a plan as shall favour your understanding & facilitate your recollecting it, and I hope

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I have now done so with regard to the history of Physic, but I am afraid least I have not done enough, and in order to understand my general plan, I shall present it to you in another view, I have already explained the divisions of the whole by marking the several revolutions which chiefly deserve to be taken notice of, but for your recollecting them still more easily, I shall

Mark them by the Persons who were the Authors of the several revolutions mentioned, and therefore that have been the most remarkable persons in the History of Physic, and that account deserves to be mentioned. —

The first period then extends from the beginning of the Art, which from the Greek account, is from the time of Aesculapius to the time of Hippocrates, who united the Philosopher to the practical Physician, thereby founding the Dogmatic System. — The 2 period extends from Hippocrates to the time of Serapion, the most commonly supposed Author

of

of the Empirie Sect. — The next period ex-
-tends from Serapion to the time of Themi-
-son, the undoubted Author of the Empirie
Sect. The 4 period extends from Themison
to the time of Galen, the restorer of the
Antient Dogmatism of Hippocrates. — The
next period extends from Galen to the time
of Paracelsus, who introduced Chimistry
into the Seats of Physic. — The 6 period
extends from Paracelsus to the time of Harvey
the undoubted discoverer of the Circulation
of the Blood. — And the next period extends
from Harvey to the present time, or if you
will to the time of Dr. Boerhaave, for his
his System is passing away. There is no other
name for distinguishing the present age;
so if you can remember these 8 names of
Asculapius, Hippocrates, Serapion, The-
-mason Galen, Paracelsus, Harvey and
Boerhaave, you will recollect our division
of the History of Physic. But still Gentle-
-men, it is not quite enough to remember
these divisions thus generally either by
the revolutions or by the persons produc-
-ing them. But it seems further necessary

to

to mark their relation to time, to mark their Date, that all the events may be the more ea-sily remembered by their being connected wt. the other events in the History of mankind.

With this view thereof, you will be pleased to observe that the first period extends from the first beginnings of the Society, per-haps from the Creation of the world, to about 400 years before the Christian Æra, or 560 years before the birth of Alexander the Great, when Hippocrates is supposed to have lived. — The next period extends to 287, to the time of Ptolomy Philadelphus, (N.B. some of these no. are perhaps not accurate. — The third period extends to the birth of Christ, in the Reign of Augustus Cæsar, when Themison lived. — The next period extends to the middle of the second Century, when Galen flourished, the Contemporary and Celebrat-ed Physician of Aurelius. — The 5th period extends from the 2 Century to the beginning of the 16 when Paracelsus lived in the time of Charles the 5th. — The 6 period extends from his time to the Middle of the 17 Cen-tury, when the Circulation of Blood dis-

covered

discovered by Harvey came to be understood, and received over Europe, and this period was sufficiently remarkable by the several wars that disturbed Great Britain, and the change that took place with regard to natural knowledge. —— The next period extends to the present time, which I think you are in a condition to establish as well as I am, whether you will do it by the Age of Frederic the third of Prussia, or by George the third of Britain, or whether you will distinguish it by our extensive conquests in america, to the mississipi &c. or by the period in which the antient Republic of Poland was so arbitrarily divided among its neighbours. Thus I have given you a plan and the gt. outlines of the History of Physic.

It is now my Business to go on to remark the most remarkable Circumstances attending the several periods I have thus marked out, In considering the first period of our History as the origin or first beginnings of our art, This some good Christians would impute to a revelation to the first man, but at no period have

we

we any such marks of a divine original.—
The Heathens have imputed it to a particular
Inventor among men; but it was not possible
for the sagacity of any single man to acquire
so much knowledge as to deserve the name
of an art, and we can give a more natural
& probable account of the matter. It must have
arisen spontaneously among men like every
other necessary art, and from very simple and
imperceptible beginnings must have arisen
to the form of an art. Pain and Sickness
necessarily urge men to seek relief, instinct
directs to same remedies, the random trials
which pain suggests must have discovered
others; and the constitution of the Body
by purging, vomiting, hamorrhagy &c. giv-
-ing cures, must have directed to more, and
these three means of obtaining spontaneous
Cures must have given observations &
led to an imitation of them for constitut-
-ing an art of Physic. But these observations
were made and continued for some time as
first made, scattered in different hands, so
that in some Countries they were obliged
to expose their sick in the high ways

&

and there are some vestiges of the Male of Phy-
-sic still remaining in Britain, for they still
consult every Gossip coming into a sick per-
-sons house, as if no such art was in the
Country. This Male of Physic however would
not long continue in any Country, as the
fools of Physic would be by degrees collected
into one hand, as into that of the master
of a Family, and any reputation acquired
by such a person, would establish such a
collection, and the person himself as a
practitioner, and this knowledge conveyed
to their Children, or other Disciples would
continue to increase there number Thus
the art would be established in every coun-
-try, and there is no country without this
art of Physic, and this is what we call the
natural Male of it.

But it did not continue long like it
put on the Artificial form, for men were
cunning enough to take advantage of
this natural Male, to avail themselves of
every passion of the human mind, &
therefs. of the love of health and fear of
death, Thus we find Physic and Religion

generally

generally combined, and the priests the only Physicians, thus it was among the Druids in Britain, thus it was in Egypt the Country that we know was first possest of arts. Thus the Asculapian superstition first came into Greece; from which Country Physic and most of the other arts have been derived into all the other Countries of Europe. The particulars of the Asculapian superstition we leave you to learn from the Histories of Physic; it was common to have recourse to the temples for advice, and also to hang up votive Tables there, informing by what means they were relieved, so that the temples became repositories of the art, and the Priest the most knowing in it, the Temples that became the Schools of Physic, tho' only of the natural Physic we spoke of before, that was only established upon the footing of experience and observation, but they were not on the best footing for this purpose, for it came to answer the purpose of the trade, and these temples were scenes of absolute knavery and craft, and they could not gain much by their experience when they keep to their temples.

But

But this could not serve the purpose of a Country advancing in the Male of Arts as Greece then was, so that either the Priests themselves or their Disciples joined forth and spread over the Country as clinical practitioners, first in a circumforaneous manner, but at last they became settled as the Physicians have done ever since This is the substance of what we have to point out as remarkable in the first period of our History. It is obvious that the art whether in its natural state, or in the time of superstition, must have depended upon experience, not that they were without their theory which men are fond of, but they could not advance far with regard to System. This came afterwards from the time of Thales who founded the Ionian and of Pythagoras, who founded the Grecian Schools of Philosophy; when those of the Pythagorean School were employed in Dissections for learning the Structure of the animal Body and the Philosophers entered upon the practice of Physic. These Philosophers were liable to despise the ordinary Physicians, who trusted entirely to experience, while they

again

again upbraided the other for their impo-
-tent practice, but the ordinary practitioners
had certainly the better of them, for the Philo-
-sophy of these days would go but a little way
without the facts that were to be learned from
actual practice; and it was a combination
of these that effected any change in the art
and it was this that gave occasion ~~to~~ to mark
the second period in the history of Physic

In a Country advancing in Philosophy
and arts this must necessarily take place, we
are ready to enquire into the Cause of any
thing, and any attempt of this nature is
received with applause and even admirati-
-on this happened in Greece and it is com-
-monly imputed to the Celebrated Hippo-
-crates, this is indeed perhaps owing to his
being the most antient writer that we have,
but he is certainly the first in whom
we find marks of a Dogmatic System,
and from his time a ~~=~~ Dogmatic System
of Physic was Cultivated without being
referred to any more antient Author.
The History of this considerable period
commonly makes a considerable part

in

in the History of Physic; but the particulars of it do not concern you much, and I am not satisfied with regard to the certainty of my knowledge, with regard to this celebrated person, the age he lived in, what books he wrote, or what was his system are known with no certainty. That he was truly a great man is not to be doubted, — but the superstition of moderen times with regard to such persons is very often founded in ignorance and fashion, his system has continued in most of the Schools of Physic ever since, but what the condition of it was in the hands of Hippocrates, or what additions were made to it by several celebrated Physicians of Greece, as Praxagoras &c. afterwards, we do not exactly know. It is the general Scale only that we can take notice of, and from the want of anatomy, and from the small progress made in natural knowledge in general we have reason to believe that the Theory of those Days could do little service to the Art, and might do harm, but the Dogmatists then had the apology to make, which

which is the apology for Dogmatists of any age that while they cultivate theory, they neglected nothing that experience could teach them for cultivating the Theory of the Art the Dissection of animals was necessary and at length they set about the Dissection of the human body itself, this was especially owing to Erasistratus and Hierophilus, both professed Dogmatists, but Erasistratus was attached to his Theory and System and introduced that mild and cautious practice which much Theory readily suggests, but Hierophilus was dissident of his Theory & was in quest of efficacious remedies, and by these and his Cultivation of anatomy he gave rise to the empiricism which marks the third period.

I have observed that Physic originally depended upon experience and observation, and that the natural Male of it was empirical, but it was not absolutely without reasoning. The Male of the Science indeed did not admit of much but men are forward of reasoning, they have few doubts and are never professedly sceptical,

But

But here a more formal Empiricism arose and a Set of men who professedly rejected all reasoning, and declared against all means of improvement and therefore against anatomy. But here is a proper place to make a pause, and the rest of the Subject I refer till tomorrow morning. —

Lect.r 3.tia —

As it is still improper to enter upon the proper business of our Course, I propose to entertain you with a short sketch of the History of Physic, a Subject that very much deserves your attention. In the time that I can bestow upon it, it is not possible to enter into any minute detail, nor would it be proper for you to consider it at present. I propose only to give you the fundamental parts, and for this purpose I told you, that the whole may be divided into 7 periods distinguished by the several revolutions that have happened in the Cultivating the Art, and the several persons that gave rise to them, with the periods of time in which they occurred. and having given this account, I proceed to take notice

of

of the more remarkable Circumstances that
had occurred in each period, the first Period from the first beginings
of Civil Society till it became an art of some
refinement i.e. till Philosophy contributed to
its improvement in this State the art has
been among every people in its natural State
which always arises necessarily, and I may
say Spontaneously among the rudest and
most simple people, and among many
very antient Nations the art of Physic was
connected with a particular superstition,
and was under the Conduct of a Set of Priests.
To what length of improvement the art
proceeded in either of these States I left you
to inquire of the Historians of Physic, but
I observed to you that it could not make a con-
siderable progress in these circumstances
that particularly in what I may call the
Asculapian establishment there were many
circumstances that were unfavourable to its
progress. we have only need to know how
it proceeded in Greece, wherein a nation
advancing in Policy they could not be
confined in their temples, but must
spread among the people and become
indep.t

independt of their Temples, and of the Superstition belonging to them, and they could not fail to attempt the application of their Philosophy to Physick, and accordingly this produced the first revolution. It was abt the Age of Socrates, when Philosophy was more especially applied to the improvemt of Physic, perhaps it was somewhat more early, but it was not in the hands of Practical Physicians, and Hippocrates was the first that united the Philosopher & practical Physicians by this he offered a new view of Physic to the world. which would be received with applause and it is not to be doubted that the Philosophic Physician could not miss to be in esteem in Greece, and after his time there were no celebrated Physicians who were not of his Sect, i.e. who were not Dogmatists. With regard to Hippocrates whose History fills up a great deal of the History of Physic, I have been very short, as there are very few particulars that I can ascertain with any exactness, I only mark the effects

of

of his plan of Physic, the state of
anatomy was then low and mean,
and without the assistance of it, it was
impossible for a Theory of Physic to
be established, it was well if the attempts
towards Theory did no harm, we be-
-lieve however that their Theory had
no bad effects for they were extremely
attentive to observation and to what-
-ever experience could teach them, &
with this attachment to experience
it was not only safe but proper to attempt
some progress in the Theory of the Art
but from the low state of anatomy they
could not make any considerable pro-
-gress, they had entertained upon the
Dissection of brute animals but had
not 'till after the time of Hippocrates
entered upon the Dissection of hu-
-man bodys, this came not till the
Ptolemies Soter and Philadelphus
of Egypt, The one seemingly pretty
much attached to his System intro-

duced

introduced a mild and timed practice
while the other namely Hierophilus too
attached to it sought every where for ef-
-ficacious remedies, he was therefore em-
-ployed in the study of the materia
medica, and he gave the same time
-ous to his Disciples, and this led again
to an empiric system, and the rise
of this marks the beginning of an 3d
period of Physic and so far I brought
my acct yesterday. —

With regard to the first author
of the Empiric sect, many impute
it to Philenus of Cose, and the pur-
-suit of efficacious Remedies might
determine him to follow the same
plan, and so far Philenus might ap-
-pear as an empiric, but it is not pro-
-bable that any Disciple of Hierophilus
should enter into a direct hatred
of the art of anatomy and we must
seek for some other foundation for
it There the School of Hierophilus
He practised the dissection of human
Bodies at Alexandria, but the Egyptians
have

have had the utmost aversion and horror at the touching of a dead body, they must therefore have conceived such an aversion at the Greek Physicians who laid their foundation of the study in anatomy, it was therefore the Policy of Serapion a native of Alexandria to gain the favour of his Countrymen by declaring against Anatomy, and consequ. against Dogmatism and for avoiding both Serapion found many pretences, & he is really found to be the Author of the empiric sect, which spread over Greece and continued for some time in considerable credit. But Serapion did not give the System of his sect its finishing form. This was reserved to a Physician named Glaucias, who laid the foundation of the whole Art in these three particulars observation, history, and Analogy. It is not my business here to explain this empiric System, their plan was sufficiently specious and promised a great deal, but it had truely no considerable effects, there were several men of reputation

reputation that belonged to this sect, but what they contributed to the improvement of medecine is very little known, but it would appear that neither the particular persons nor the whole of the sect taken together did what was wanted, they did not produce a more accurate history of Diseases or of their remedies, for if any such thing had ever existed it must certainly have been more or less transmitted to posterity, but we have not one scrape hardly of the writings of the empiric Physicians remaining, and we have this further proof of the fruitlessness of the empiric plan that it had no effect in suppressing the Dogmatism which in those Days was certainly very frivolous, for we find that in spite of their Declamations the Dogmatists were very numerous, and there were appearing now and then men of rank and practice that laid the foundation of the several schools, we have nothing further to say of

the

The Dogmatists were the most remarkable in the Schools of Physic and the only revolutions now are the different modifications of Dogmatism that now occurred, of these I have marked the Sect called methodici, These happened at Rome, and it is proper to take some notice of the progress of Physic in its dominions, the illustrious common wealth of Rome was for 500 years without any refinement in the Arts, and they had that of Physic, only in its rude natural state, but at length Rome received the arts of Greece, and among these received also the Greek Physic. When the first Greek Physician Archagathus (or Archagathus) was received with particular favour at Rome but his surgery appeared cruel, and created in them an aversion to the whole of the Greek Physic, so that he was banished from the City, and accordingly for 100 years afterwards the Greek Physic made no figure at Rome

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till the time of asclepiades who introduced
the mild and gentle practice of Evacuations
he attached himself to none of the sects
among the greeks, but formed a plan
of his own adjusted to the manners &
Philosophy that then prevailed at Rome,
his Philosophy was that of his co-tempo-
-rary Lucretius the Epicurian, and he soon
made a scale of the body corresponding
to it, that the fluids were every where in
motion in the body, and that as they
were of different sizes and forms so that
there were as many different places and
passages adjusted to the motion of these
different fluids in the different parts of
the system, and upon this seemingly
specious doctrine he readily founded
a Pathology, & give an account, a Theory
if you will, of all the diseases affecting
the Human Body. Thus a Map page
of the pores formed one kind, and a
laxity of the pores and too free a trans-
-mission formed a contrary state,
and, and he easily extended each of
these genera to a great variety of

species

species, according to the seat of the dis-
-ease in one or other part of the body
or as the passages belonged to one set of
fluids rather than another and it was
very easy for an acute eloquent and spe-
-cious man to talk over this matter but
it is obvious that this system of his, re-
-quired so many subtile distinctions
that his system was not easily ma-
-naged by persons of less acuteness &
eloquence than himself, and the effect
of this was that soon after him Themison
a Physician of Rome in the time of
Augustus Cæsar, finding his subtilities
difficult, he maintained that they were
superfluous and that it was enough
to consider what was in common to
diseases, to consider their genera; and that
the consideration of the different pores
of the Body and of the different fluids
might be safely neglected, so that he
reduced all diseases to the Strictum,
the Laxum, and the mixtum, these
are the very terms that the metho-
-dici employed, and Themison thought

it

it was enough to refer diseases to one or other of these 3 general heads in order to form the plan which was called the method and from hence the persons were called the methodici. As this method derived some reputation from asclepiades it was very generally received at Rome, and the Physicians of this sect continued to be in fashion and in the highest favour for some time after, but Rome was a great and populous City, which supported a great number of Physicians who came to it from every State of Greece, so that there were Physicians there of every form, Methodics, Empirics and Dogmatists so that Physic was frequently there in a remarkable divided State, and this was the case wt regard to it, when Galen came there in the middle of the Second Century after Christ.

This celebrated person made some revolution in the State of Physic, which I must give you some acct

of

of, and particularly with regard to him-
-self. After a liberal education in Philo-
-sophy, he applyed himself to the Study
of Physic, and when he had acquired con-
-siderable knowledge in every branch of
the art, he came to push his fortune at
Rome, but he found it difficult to make
his way there amidst the Cabal and Emu-
-lation, which generally takes place in all
great Cities, so that finding himself neglect
for it he retired again to Greece, but he
did not leave it without some reputation,
so that Marcus Aurelius passing thro'
Greece enquired for Galen, and brought
him back to Rome, and he soon after
gained the favour of the Empress
Faustina and of the Ladies at Court
which circumstance is ready to make
a Physician of much less merit than Galen
in the Fashion, and as every Physician
pretended to be the follower of some great
name, as that of Prax: Eraci[illegible]strat: Hie-
-rophi: &c. Galen in like manner pre-
-tended to follow Hippocrates, and
thence it is that these writings have
been

been transmitted to us with great fame,
and have deprived us of the writings of
several celebrated Physicians of Greece.
While Galen did thus succeed at Rome
he loudly declaimed agt. others, and con-
tributed much to discredit all the dif-
ferent Sects of Physicians, and he greatly
established his own by the numerous
writings he published, so that we truly
have more of his writings than we've
of any antient writings whatever,
he wrote upon all the parts of Physic
and gave a more complete System than
ever we had before, and this complete-
ness will always recommend writings
especially coming from a person of
great name, and authority, and in short
these Circumstances all concurred to
make all the other Sects of Physicians
languish, and to be neglected; and this
state of Physic continued for 1400 years
after his time when it suffered ano-
ther remarkable change, to which
several Circumstances concurred, Even
in the time of Galen Literature was

declining

declining, and the Division of the Roman Empire, which happened soon after was prejudicial to it, the Goths and Vandels extinguished the whole of the Literature in the Western parts of Europe which State of things subsisted, for a long time after, and in the Eastern parts tho' Literature still subsisted, it was in so languishing a way, that no attempts improve it was made, so that the System of Galen still continued, and another circumstance also occurred, which it is necessary to take notice of in the 7th Century a new Religion, and a new empire arose in Arabia, this soon spread its conquests into the neighbouring Countries, and at first it was extremely unfavourable to the Literature of every kind, till a certain set of rulers arose among the Saracens who were more friendly to it, and they behaved to seek for this Literature among the Greeks, and they were here led to receive the Peripatetic System of Physosophy and the

medical

medical System of Galen, which is founded upon the Aristotelian System of Philosophy and thus they cultivated Physic, many of them became considerable writers, and tho' living in very different Countries they are all named Arabians. They give us an account of some diseases not known before and from the same circumstance of their living in different Countries they give us accounts of some new medicines, and they are the first who have made any mention of Chemical Remidies. The same arabians seem to have made some advances in the practice of Surgery, but they made no changes in the general ~~System~~ System of Physic, Galen was strictly adhered to by all of them In this manner however they supported Physic when it was almost quite extinguished in the western parts of Europe, and it was again revived by a communication with the arabians & in the 11th Century a Seaol of Physic was opened at Salerna in Italy, the learning of which was drawn from the Arabians, another was opened at mont pelier in France and another one at Paris which

soon

soon became remarkable, in the 12th Century
Universities were established in the several
Countries of Europe, which embraced the
Study of Physic, but all their knowledge
was derived from the Arabians, and that
too in an imperfect manner (Male) and
hence they became acquainted with the names
of Hippocrates and Galen, but they could
only read them in the very imperfect transla-
tions made by the Arabians, and at this time
Rhazes and Avicena afforded a text book for
all the professors in Europe, but it was still
the System of Galen and the Physicians of
these Days were in no condition to make
any addition or amendment of it. in this
Male Physic continued till the end of the
16 Century, but against this time various cir-
-cumstances concurred to make some change
early in the 15 Century the Study of the
latin language was attended to, and also some
attention was paid to the Greek, the Study of
this last was favoured by the taking of
constantinople, which made the learned
Greeks disperse themselves over Europe
and the invention of printing about

this

This time was also favorable to Literature.
Towards the end of the Century, the revolu-
-tions that happened in the several States
of Europe to establish the tranquility &
government of it also contributed somewhat,
also the Discovery of America, and of the
passage to the East Indies by the Cape of good
Hope which all concurred to favour Literature
towards the end of the 15th Century and that
had a considerable effect upon our art of
Physic. Physicians now studied the Greek
Language and were led to the original writ-
-ings of Galen in which they found a
purer Source of knowledge than they had
done in the Arabian translations, many of
them attached themselves entirely to the Stu-
-dy of the Greek, and attached themselves
entirely to the System of Galen, and where
they found any difference in practice, they
preferred the Greeks, but even in these Cases
of a difference many of the Physicians of
these times still adhered to the Arabians. So
in the famous dispute that arose about
blood letting in the Pleurisy, the Arabians
had been used to bleed in the side opposite

to

to the past affected, but upon consulting the Greek writers they bleeded upon the same side so that same proposed to follow the Greeks, but many of Considerable Rank followed the practice of the Arabians, who had been their first masters, and the Authority of the Emperor Charles the fifth was necessary to compose it. The Arabians still continued to be of same Credit, but the credit of the Greek Physicians prevailed more & more, 1200 years had now passed since that System was first propagated, but it came now to be greatly weakened by the introduction of Chemistry which marks the

6th period of our History we have already said that the arabians were the first who mentioned chemical remedies, and it is certain that the invention of Destillation happend when the Arabians first appeared in Europe. However this may be, Chimistry was now Cultivated and applied more or less to the purpose of medicine, its progress indeed we are but little acquainted with and there is but little mention of it in the 14, 15, & 16 Centuries,

The

the remedies got from it were too violent to be em-
-ployed by the inert practitioners of those Days but
it was certainly cultivated, for a writing appeared
from one Basil Valentine intitled Currus triumph-
-phalis Antimonij, and this author applies
Chemistry to medecine with a liberal hand
but there was no mention of it in the medical
writings of those Days, and it was owing to Pa-
-racelsus that Chemistry made such a considerable
figure In the history of Physic I should go on to
say somewhat of the History of such a remarkable
person; but it will be better to reserve the whole
of it till to morrow morning. —

Lect.r 4th

We proceeded yesterday Gentlemen in de-
-duing the History of Physic upon the plan I
have laid down. I will not detain you with a
repetition of any particulars but I must point
out a few reflexions which arise from those we
mentioned, and in the first place when the
State of Physic was purely dogmatical that
under certain precautions Dogmatism does
no harm and may do good. for every thing
valuable, the whole of the facts which
we now have remaining of the antient

Physicians

Physicians came entirely from the Dogmatists the Theorists, if you please to call them so. on the other hand it is to be observed that when a formal system of Empiricism was establish-ed it seems to have done no good, tho' at the time when Literature was Cultivated at Greece and Rome, the Empiric system subsisted for 100 years, yet we have no evidence of its good effects, and they must have remained if they had ever in any degree existed. I marked one instance, of its having no effect in suppressing even the privatons Dogmatism of those Days, and if a pure empiricism could perform but one half of what it promises it would go a great way to destroy Dogmatism altogether, but the ancient Empiricism had no such effect, it immediately had many many followers, but the Dogmatists have always continued at the same time, from the period we speak of I have said the only revolutions are the several changes that have happened in the State of Dogmatism the first I have had occasion to take no-tice of was the scheme for reducing Dog-matism, which produced the methodic

Sect

Sect, this does not appear a matter of importance, and indeed the System of the ancient methodici was not of any importance, but looking into the history of Physic we find the general scheme a good one, so the most part of Physicians have been in fact methodici, for a rigid Dogmatic System is hardly safe in any hand. & therefore a method, an abridgement seems necessary and what we call our general pathology is no other than a methodic System. The History of the methodic sect brought me down to the time of Galen & I have explained by what means his System came to prevail, and by what concurrent circumstances it continued for a long time after. The History gives many reflexions upon the fate of Literature, but I may say that still in a more enlightened age we are still but infants in Literature. unhappily the followers of Galen acquiesced too implicitly in his System, and it was to the benefit of the Art that any thing should occur and break of this slavish attachment. I have said that this was

particly

particularly affected by the Introduction of Chemistry, and that this too was done by the famous Paracelsus. He is such an extraordinary Character in Physic, that a little detail of him will not be disagreable. He was born in the year 1492. his Father was a Practitioner in Physic, who after giving him his own Chemical instructions at home, put him into the hands of other Chemists, so that he was kept perfectly free from all the prejudices of the Schools he soon perceived that the ordinary Practitioners were in great want of efficacious remedies and such is the effect of any System followed for some length of time that it produces a tired and inert practice, and he found that some of those remedies the Chemists were possessed of, upon which he went in quest of such remedies and applied to all sorts of persons for them, and by this means he came acquainted with the use of antimony, mercury and opium, remedies that had hardly been handled by the Galenists and with these he cured diseases that had baffled the inert remedies of the followers

of

of Galen. from this he soon acquired a considerable reputation. and he was invited by the Magistrates of Bazil to a Professors Chair there in the 1625. He to be sure was very unfit for this work, as he was extremely rude in the business of Literature and was but little acquainted with the Doctrine of the Schools of Literature; but his genius and Courage afforded him a resource, he publicly declared against every System, and had the Books of Galen and Avicenna brought into his School and burnt as so much useless lumber. & he soon got a new Theory of Physic upon the principles of the Chimists, his System was indeed absurd, but his Reputation by the Cures he had performed supported his Theory. But his impetuous temper did not allow him to remain long at Basil, he quarreled with the Magistrates and left the City. after this he travelled thro Germany, made remarkable cures, and took a great deal of money. Thus he formed a Sect of Physicians who appeared in direct opposition to the followers of Galen. His arrogance and boast

however

however was useful in raising men from the langueur which had so long subsisted in the Schools of Physic, but Galens authority so long established, and supported by the System of Aristotle who had got possession of the Schools was not easily overthrown, but some other Circumstances concurred too about the time of Paracelsus. The Celebrated Vesalius was at this time much employed in detecting the Errors of Galen in Anatomy, and whatever weakened Galen increased the reputation of the Chymists and this was also increased by the bigotry of the Galenists, who rejected their efficacious remedies, in which the Publick were necessarily against them. Thus from the middle of the 16. to the 17 Century the opposition and divisions continued till several things contributed to destroy the Authority of Aristotle. The progress of Literature is always unfavourable to authority and established System, so several Attempts were made to oppose the authority of Aristotle but tho they might point out many faults in him, as they offered

nothing

nothing valuable to be put in its place
their opposition had very little effect, and
the authority of Aristotle subsisted during
the 16 century, till at length Galileo in
Italy and Lord Bacon in England offered to
the world a new mode of Philosophizing,
which had a considerable effect in destroy-
-ing the system of Aristotle and of the Schools
This too was assisted by the revival of the Epi-
-curian system by Gassendi, and by one
offered by DesCartes upon the same plan
of the Corpuscularian system. These how-
-ever had not immediately an effect upon
the Schools of Physic, These systems were
indeed favourable to the Chemists and
weakend the Galenic partly, but his system
was only fully exploded by the discovery
of the Circulation of the blood, which marks
the Beginning of the last period of
our History, In what Manner it proceeded it is not necessary to enquire here, it was com-
pleted and communicated to all Europe
by Dr. Harvey about the same time Ase-
-lius discovered the Lacteals, and Pacquet
the Thoracic Duct, so that Gassendi when
expiring said that it was upon these

that

that the System of Physic must henceforth
learn. These discoveries entirely overturned
Galens System of the Liver and gave the fi-
nishing Stroke to that Fabric and it was
to be expected that it must have immediate
effects upon the System of Physic, which
is correct according to our knowledge
of the Structure and mechanism of the
human body. Hitherto the Anatomists had
laboured upon the Separate parts of the
body, without perceiving the connexion
of the whole or seeing it only in the false
view in which Galen represented it, it
was the rediscoveries that gave the proper
view of the Hydraulic and seemingly
of the whole System of the body from
this Period Physicians were in a condi-
-tion of attempting a System, they have
since made considerable Progress in it,
and it remains now to give some gen.
account of it, from that time to the pre-
-sent, From the time of Paracelsus to the
middle of the last Century the System was
gaining ground, and the means employ-
-ed to explode Galen did not affect Chemistry,

on

on the Contrary the Corpuscularian and other Philosophies favoured Chemistry and the Doctrine of acid and alkali gave them a short methodic system, and the Cartesians hardly added more than the Doctrine of Lenton, and a little mechanical reasoning owing to the Discovery of the Circulation, as you will find in Regius Sylvius de la Boe &c. The effect of all this should have been to show that the Circulation must have a greater share in producing diseases than the condition of the fluids, and it was to be expected that Physicians should immediately Study the laws of the hydraulic system, but matters were not yet prepared for this purpose, the mathematicians had not yet explained the laws of Hydraulics, and this was only to be obtained by the assistance of the anatomist but the mathematical School of Galileo took the lead here and Borelli gave to the world the ingenious work De motu animalium, but Borelli was no Physician, and it was Bellini his

Disciple

Disciple and a Physician that imprued
it. his System promised more certainty
in the Study of Physic, and co-incided
with the then reigning taste of Philo-
-sophy, by which means it soon pre-
-vailed over Italy, and was brought over
the alpes into this Country by Pitcairn
and it became the prevailing System
over Europe till very lately, but with
what advantage to the art is still dis-
-puted, and I shall consider it in another
place, but it has certainly contributed to
put Physic in the good condition it is in
at present for the Mechanical Physici-
-ans were friends to observation and ex-
-periment, and they detected the falshoods
of particular Hypothesis exploding them
in general this establishes the innocence
of the Theories of the present age, for their
practical Influences They subjected to
the test of experience, and confirmed &
rejected them by that only, and with
regard to the most noted leaders and
particularly the mechanical Philosophers,
their speculations have not slackened

their

their observation rendered them averse to admit the experience of others we have a remarkable instance of this in the history of Modern Physic; soon after the middle of the last Century Dr. Sydenham appeared, he was bred in the Schools of England which have always given little attachment to System, and perceiving that the Theories that he had got assisted him little in his Practice, he laid them aside and formed one of his own, but so that every conclusion & rule was to be finally adjusted by observation and experience, so that he set about conducting himself by almost his own observations alone, & thus he has given us a work that is more useful in the Practice of Physic than any thing that had hitherto appeared before, and it was more valuable than any thing that had been produced by a single person, and tho upon many occasions he has a Theory as much as any man, it was without admitting

its

its undue influence, so that he shewed that there might be a great deal of Theory in a man's head without affecting his practice Willis, Morton, & Sidler were initiated in the old practice, and oppos-ed Sydenham while Boerhaave and Pitcairn received his writings, and it is remarkable that Sydenham's reputa-tion did not arise in England till it had came from abroad, and in him I have shewn the safety of Dogmatism upon our present plan. Thus I have mentioned the practice of Physic hither-to as only in the hands of mechane-cal Physicians, but towards a proper and complete Dogmatical System the mechanical Theory is not Sufficie-ent, and

we must now say what ad-ditions have accrued to it from other Sources when it first appeared the Schools of Physic were compiled by the Doctrines of the Chemists or those blended with a few others from the Philosophy of Gassendi & De Cartes.

but

but the general System of Chimistry
was imperfect and incorrect, and both
the Chemists and Cartesians indulged
too much in Hypothesis, and made a gross
abuse of them. The mechanical Doctrines
explaned these, but they neglected Chimis-
-try altogether, tho there are some parts
as with regard to the nature of the fluids
the knowledge of which must be
acquired by Chimistry and by that alone,
so that the forming a proper combi-
-nation with the Chemists and
mechanical Philosophy was still a
desarting, and which soon came
to pass, by joining the Chemical Sys-
-tem of Silvius and the medt. one
of Bellini and Pitcairn, from Bellini
they got the Doctrine of obstruct. &
Sister, and from the Chemists Boer-
-haave took the Doctrine of Acid and
Alkali, so that he combined the Doctrine
of the Chemists with the mechanical
Doctrine, and he also admitted the Doc-
-trine of Plethora, the only remains of
the Galenic System which the Doc-

Trine

Doctrine of the Circulation approved of
such a Judicious Eclectic could not miss
to succeed and he is justly allowed to
have had the greatest share and merit
in forming the present system but
perfection is not given to man, and it
was no disparagement to say that he
had it not, for the consideration of
the human Body as an animated
system and the consideration of the
N. S. as the organ of the animated
system was what he did not attend
to, this defect has been in some measure supp-
-plied, and it is proper to say in what
manner, very artlessly as appears
from the works of Plato it was taken
notice of that there was an Anima,
presiding over the functions of the
Animal Body, But this was not much
taken notice of till the time of Van
Helmont who speaks of several pre-
-siding principles in different parts of
the body and particularly of an archeus
lodging in the upper part or mouth
of the Stomach, and something of this

kind

kind was rec^d and had a singular jar-
-gan applied to it in the hands of Dolæus,
but these things were not evolved till
Stahl appeared, which was about the end
of the last Century. This person main-
-tained that the whole of the functions
of the body were governed by the ration-
-al soul, and that the exercise of the
several functions depended upon
the constant energy of the soul, guard-
-ing the body against all evil. But I
must only mention the general effects
of the Doctrine. It gives a particular
explanation of the autocrateia, the
vis medicatrix naturæ, in the Cure of Diseas
es, that Doctrine which appears so much
in the writings of Hippocrates and in
every System more or less, but it was so
managed as to be consistent with their
several mechanecal or chemical Doctrines,
and that Doctrine still seems in this respect
altogether inconsistent, for his general
principles will supersede all reasonings
concerning the human body, and in fact
in that Sect we find them negligent in

the

the Study of anatomy and that they were against all Mechanical reasoning, Sympa-thetic and Superstitious remedies only were admitted in the School of Van Hel-mont, and regarding always the Auto-evaleia, they have had but a feeble prac-tice and are enemies to the Bark, opium &c. but this is compensated by their attention to the vis medicatrix Naturæ, which has led them to study the history of Diseases more diligently and in many respects they have a great deal of Empiricism. It was to be expected that in refer-ring so much to the soul they should have par-ticularly attended to its chief organ the ner-vous system, and they have said a good deal upon the subject of tonic motion, but it has gone a short way towards the explaining of the laws of the N. S. and I must now men-tion by what other means this want has been supplied.

The Dissection of the Nerves has been the part of Anatomy most neglected by Anatomists, to the middle of the last Centu-ry till Willis and Lower dissected the Brain, and Nerves, and studied the N. S. Their

Labours

Labours in general were so unsuited to the
taste in the Philosophy that they were not
likely to become leaders, but the matter was of
such importance that it could not miss to be
cultivated, and it came to be cultivated by
Baglivi in Italy, and by Hoffman in Ger-
many. Baglivi wrote a Treatise de Fibra
motrice, but he could not complete his
Theoretical System, and this with some
considerable errors in anatomy made
made him to be but little followed, and
Pacquet in France is the only one who has
embraced his System. Hoffman has entered
into the same views, and has carried the
matter a great deal farther, maintaining
that the chief diseases of the human body
were affections of the N. S. and he has carri-
-ed this thro a great voluminious System
and this with the willings of Stahl went
thro Germany; but Boerhaave by his ele-
-gance drew off their attention, and the
knowledge of him arrived at us but very
lately, but now the System of the nerves
is spread over all Europe, and even in
the School of Boerhaave himself Van

Swieten

Swieton, lately gone one of the most illus-trious of Dr. Boerhaaves Disciples has upon many occasions ~~A~~pointed out the necessi-ty of attending to the Doctrine of the Nerves, and De Haen has particularly cultivated the Subject in his treatise Impetum in fa-cient, and Dr. Gaubius who now sits in Dr. Boerhaaves Chair has cultivated the same Subject treating de Solido vivo, and also Dr. Haller. By these means the Doctrine of the Nerves has now a full Share in the human System, and as the hu-man System can only be viewed as a Che-mical mixt, as a Hydraulic machine, or as an animated machine, our System is now as complete as it can be with respect to the several parts and as I have now deduced the History of Physic from its first appearance to its being so complete, I shall conclude with observing that our System as consisting of the parts I have men-tioned is in truth Dogmatic, but it is so ma-naged as to lose none of the advantages that are to be any way derived from empiricism.

We cannot conveniently have any meeting till Tuesday next when I enter upon our form of Institutions. ——

Lect.

Lect.r 5.th —

I have given you Gentlemen a slight sketch of the history of Physic, I hope it has proved entertaining, and I am very confident that hereafter it may be useful.

I enter upon what is more strictly the business of our course, viz.t the delivering a complete System of Physic. It is true that what I have to deliver in the Course of this season is but a part of what I add next season never only to complete this and both make one consistent and coherent whole. Some are pleased to call our present Course the Theory of Physic in what sense it may be so called I shall consider hereafter, but with regard to the common notion affixed to that term, I must say that I mean to deliver nothing in the course but what is applicable to the Cure of Diseases, which is the ultimate end of all our Studies. what we are to deliver in this Course will be applicable to practice. and the rules of practice will be illustrated and improved by the institutions that have gone before, so that they are both to be united together so make one System and the whole shall be

rendered

rendered as complete as my abilities and the time allotted to our Course will allow.

I begin now with giving you a gen.l Idea of our Subject, and for that purpose I give you a definition of our art, as I have set it down here (Here is the small Book that I intend to put into your hands as a pretty complete text of the Physiology, tho in many respects imperfect and incomplete, but its use I hope will make amends for faults and defects that were not easily to be avoided.) I have said here that medecine is the art of Preventing and of curing diseases. If the term Disease is understood the meaning of our Definition will be sufficiently obvious some however have thought that this term of Disease req.d explanation, and they have attempted to define it by its general Cause, Thus Dr. Hoffman at the very beginning of his System has thought proper thus to define a Disease Morbus

now with regard to such a definition I say that its hardly admissible, that it is hard-

ly

hardly to be employed at any period of our
Course because it is too general, and gives no
particular Idea. I am certain at least that any
such definition is not admissible here in the
beginning of our Course, especially before
we have spoke of the cause either of health
or sickness, With regard to the meaning of
this term therefore I may trust to common
experience, when we speak of it in the abstract
we express merely a simple feeling which
is not to be defined. But has been thought
necessary to explain the feelings, and no
body has done it with so much success as
Dr. Bacth. in the two first paragraphs
of his Institutions

now this is the most simple clear and elegant
explanation of our feelings with regard to
dis. that I think has been offered at any time,
and such a definition of a Dis. is all that is
necessary in any part of a course of Physic.
The terms of my definition being thus explained
the whole of it is sufficiently intelligible. But

I

I may perhaps take notice that it differs a little from these most commonly given, and that in two respects, as from comparison will appear Boerhaave defines medecine in this manner, Medecina

Dr Gaubius is a little different from that, his definition is properly this Medicina

This Definition of Dr Gaubius might admit of some Criticism, but we have not time for that at present, but with regard to both I would observe that they attempt in some measure to define it by the means of the art, Scientia comm
says Dr Boerhaave, why I think it is impossible in a definition to convey any simple and determined Idea, with regard to these means, but when I call medecine an art, I imply the knowledge and the use of means for whatever is said further in that way conveying no distinct meaning, the Distinction must rest in the end and purpose of the art. viz. the preventing and the Curing of Dis: &c.

Sufficiently

sufficiently distinguishes medecine from every other art whatever. 2ly. The common language is that medecine is the art of preserving health and of Curing Dis: but I have said the art of preventing diseases, altho I dont think but the preserving of health is the object of a Physicians Care, but I endeavour to apply it with more exactness, for I maintain that there is truely no other means of preserving health, but what consists in preventing diseases every other Idea is false, and it has led to a superfluous, very often a dangerous practice I say health being properly understood that we cannot add to it, nor increase its powers there is never room for our art, but when there is some defect in the constitution, some bias, and tendency towards dis:, and it is only by preventing this tendency, by correcting these defects, that is by preventing Dis that we preserve health, by the by, when I come to make the division you will observe, that I have omitted the Hygiena, not because it is not an object of the Physicians art but consists entirely in the pointing out & in the avoiding of the remote causes of

Dis:

Dis: whether predisponent or occasional so I have not omitted the subject as a part of it will be found in the pathology, and the other part of it in the Therapeutics, but perhaps this subject might require a little more discussion, but it is not proper here to detain you with it, I formed my definition for the sake of conveying somewhat more exact, and I have now explained it to prevent all Cavilling so having now given some general Idea of our subject, I say in our next paragraph that certain general Doctrines are necessary to be premised which are called the Institutions of Medecine, if immed.ly leads to our question in what manner the art is most properly to be taught by me, and most successfully studied by you. For a long time past the teaching of Physic has been divided into the Institutions and the practice, we must here consider what is the ultimate end of all, what is meant by the Course of practice, in order to find out what may be necessary to it as a preliminary for that purpose I consult D.r Boerhaave in his second Aphorism he has these words duas

you will plainly see that his idea is, and what must be every ones notion that what we call the practice is the art applied to particular Dis: and persons, but the most part of Physicians has been of the opinion that before considering this art in its application to particular diseases, certain general doctrines are necessary to be premised which we call the Institutions of medecine, and this is the view that the same Dr Boerhaave gives of Institutions, viz. the Doctrina generalis medica but there is some ambiguity in the expressions of Dr Boerhaave when he entitles his Book aphorismi detegendi morb: is the discerning a Dis: by its external appearances, or Symptts only, and in this sense the definition wd be admitted by all sorts of persons but his meaning is Detegere and cognos: morb: per Causas. I must allow Dr Boerhaave to explain himself which he does in his 3d aphor. quæ ergo

he is not allowed to know a Disease, unless he knows the causes of the Disease, & he goes on in the fourth aphorism in the same manner to a more particular application of this, and in one or two aphorisms more to shew the necessity of other parts of the Institutions. resting the whole not so properly however upon the Physiology, & I might say that he does not give the most favourable and most proper idea of the manner of Teaching it for independent of a Physiology there is a propriety, a necessity for institutions, however there is no occasion to push the matter that length at present for I maintain that a Physiology is a necessary part of the Study of medicine. But I can't let this pass without saying that many Physicians are not agreed in this present conclusion from the history I have delivered of the disputes with regard to Physiology, you will observe that the rejecting it, and trusting to experience was very antient, and to this hour it still subsisted, and some of you Gentlemen may have taken a side in this question and are perhaps of one part only, and it might

might be necessary to obviate your doubts, &c. I am going to engage you in a contrary plan but unless you are more learned than I suppose you to be, I cannot imagine you prepared for such a Discussion as the proper Decision of the Subject might require, but I do think it may be necessary to give you some general notion of it, so much as may be necessary to conquer any prejudices you may have and to engage your attention after the manner we are to conduct the Study, now the best manner of doing this will be from History to give you a little Sketch with regard to the manner in which this controversy arose, and to give a general notion of the two systems it produced

When Philosophy is recent among any people they are ready to be conceited & presumptuous, they are ready to fancy that they may soon be able to account for every thing. At a certain period of the literature of Greece the Physicians were infected with this fancy they imagined that they might soon acquire the knowledge of the mechanism of the human body, and in consequence

consequence that they might understand Dis-
-eases as consisting in the disorder of that
Mechanism so that they should be better enabled
to cure 'em; the expectation, the view, was
tempting, and if Hippocrates had laid down
such a plan with this condition that it was
only to be executed in the course of ages
in a long time after, their design would
have been commendable, but men have not
patience for that, and even Hippocrates, tho'
he was pretty cautious, and several others
were rather presumptuous in applying
their theory to practice there is nothing
more clear and certain than that the state
of anatomy and of Philosophy in those days
was so imperfect, that they could not produce
any useful or safe theory, if it was in the
least carried to application, therefore while
the matters were in this state, if the policy
of one Physician rendered it convenient for
him to oppose this, he had a ground for
doing so, and had a specious pretence
for proposing a different plan, such
an accid. happened in the Case of Serapion,
which made him oppose the Dogmt.

System

System, and to propose a purely empirical one.
This opposition to the Dogmtic of these days
was very reasonable and very promising
in its effects, but I shall give a more particular
account of this System. The empirics alledged
that as soon as there were men there would
arise an art of Physic, and room for the imi-
-tation of nature. In many Dis: instinct leads
men to remedies, if it does not, the effects of
pain and sickness are such as serve to urge
men to various random trials, and the powers
of the animal acon.t produce qt. I may
call Spontaneous Cures of many dis: by
certain effects which we may think of
exciting again by art in short from these
three sources as before explained an art of
medecine might arise, so that from ex-
-perience more or less of the art would nec-
-essarily arise, and it would become an art in so
far as men imitated the efforts of nature or
followed instinct, or confirmed or rejected, as they
saw occasion what had been formerly attempted,
such an art may arise from experience alone,
but in an age when neque desidia neque
luxuria aderat, diseases would be rare, and

persons

persons would be in danger of perishing by the art, so that it would be necessary that observations should be collected both of different hands and of different ages by traditions and writings and that when accumulated they should form a History which would soon arise to a considerable matter, and be a sure resource to many who had little experience of themselves All this too was specious, but at all times the Empirics have been ready to allow that the variety of Dis: has been in some measure endless, that the most common are greatly diversified, and that entirely new Diseases now and then arose in which a third part of their system was necessary, what they called analogy the transitus ad similem, when the dis: was not described in their books they took the next to it, and ventured to apply the analogy. I say all this plan of empiricism is sufficiently Specious, but now from a trial of two Thousand years it is not found to be solid, it is not effectual to the purpose the engaging the attention to a prodigious concourse of Phenomina is extremely difficult and so far as the history of facts has yet

proceeded

proceeded, they are incomplete and extremely false. I say just now that 2/3 of them are false, partly by mistake, partly by design. so that neither is observation so effectual, nor history rendered so complete as might be supposed and if ever will attempt Empiricism at all analogy comes to be very frequently necessary but this is destroying the whole system, for analogy leads to Dogmn. so the limits between the Empirical Analogy and Dogmn. are not to be marked out, many therefore notwithstanding the Specious ness of the empiric plan have perceived its being ineffectual, & have therefore remained attached to their Dogmatism and that too upon specious pretences.

The most favourable account of the Dogmatists is that they always in the first place declare that they reject no part of the Empirical plan, they take every thing that that observation or history affords them & they willingly use an exact imitation of nature, but they complain that all this does not go far enough and that some farther assistance is absolutely necessary, they again

at

at greater length allege the fallacy of observa-
-tion and of the imperfection of history
and that its impossible to supply these defects
to this in the language of Dr Gaubius in
the 23 § of his Pathology, Privatum &c. The
conclusion is qua quidem &c. it is that pro-
-digious diversity in the concourse of Phinamia-
-non that makes the Dogmatists conclude that
the analogy of empirics founded upon the
Collection of single facts is of very little use
and that it was necessary to obtain general
facts, and to obtain these we must be assisted
by anatomy, Physiology the general Pathology
and the Study of Therapeutics, this might be
clearly demonstrated and it shall be demonstrated
in the conduct of our Course, and I now go
on to

Give you a general notion of what
we call the Dogmatic system, when a Dog-
-matic Physician is to prescribe a remedy
he does not propose it upon the footing that
it has been formerly experienced useful
he may do so, and he will no doubt do it
if he can, but consid: as a Dogmatist he
proposes the remedy as suited to answer

the

the Indication which his System has formed,
i.e. the knowledge of the change necessary to
be produced in the human body in order to change
the state of Disease into that of health. It is up
the forming of such indications, the ascertaining
wherein the Change consists that is to be
produced by any remedy, that is peculiar to
him as a Dogmatist, and for that purpose
it will plainly imply as necessary Physiology
and Pathology the knowledge of the state of the
Body in health, and in what manner that is
changed when disease occurs, and it is from a
comparison of these that they are led to form
an indication, or the change that is necessary
in order to procure health, i.e they form
the great lines of Therapeutics, and thus we see
how the Dogmatists form a System of Physic
or a set of general Doctrines under the title
of the Institutions of medecine.

But candor now obliges me to say that
if the System of Institutions were perfect
the application of it to particular Cases wd
be easy, nay there would be no need for apply-
-ing it to particular Cases, and the Dogmt.
System would be greatly superior to the

empiric

empiric, adding considerable advantages to it.
but this Dogmatic plan is very far from being
perfect in the hands of any body, who has attempt-
-ted it, this appears from the changes it has
undergone for 200 years during an active date
of the changes of Literature. I must own that
the Dogmatics for the most part have been rash
and presumptuous in attempting such syst-
-tems as they have done. I say our system
considered as a whole is extremely imperfect
and is likely to remain so, and there is
great danger in viewing the matter in any other
light, and if we take the history both of empi-
-rics and Dogmatists, and consider their respec-
-tive plans, and the execution of them we will
find that both of them are defective, and if we
would conduct ourselves properly we must think
of combining them together and we mean to
give every fact that empiricism has fairly
afforded us, but at the same time we must con-
-stantly keep in view that facts have been very much
mistaken, and that single solitary facts are
of very little use, and to render them useful
we must increase their number, and we
must especially endeavour to render them

general

general, we must endeavour to obtain general facts, and for this our views must be very comprehensive, and it is necessary to study every circumstance and appearance of health as well as of Dis: and we must also consider the whole of surrounding nature; all the bodies and powers that upon any occasion may act upon our system, in order to get the whole of the facts, and to be able to judge. Then we must study natural History, Chimistry, and especially anatomy, all which give facts relative to the Cure of Diseases and this is the first and leading part of my plan to give a full enumeration of facts but in order to form general facts, they must be arranged and digested, in short we must throw them into the resemblence and appearance of a system, and therefore there can hardly be a better or a more proper arrangement than that is named the institutions of medecine.

Thus I have brought the matter to the particulars of our plan, and I say that I am endeavouring to deliver a system, but I am ready, every body must be ready, to acknowledge the imperfection, obscurity and fallacy of this matter considered as a whole, and

as

as a system, but tho' it must be acknowledged, in
the several parts of our Course there are many
particulars that are well ascertained. there are
many facts that are established upon a solid
foundation, and are applicable to practice, &
I hope to convince the Gentlemen that attend
me that they cannot apply to the study of what
is called practice without being acquainted with the
general Doctrines that are established in the
Institutions. I proceed therefore with some
confidence to engage you in this, and I hope
to manage it so as to render it sufficiently safe
and useful. but after all it is still true that there
are many that seemingly dont admit of our
conclusion, and there are a common num-
ber of Practitioners that will declaim against them
I must not enter into a particular controversy
with them till you are in a better condition
to judge of the facts of empiricism, or of
the fallacy of Theory, and I will not urge
the shallowness of knowledge the narrowness
of view and indeed the total incapacity of the
generality of our adversaries. but I shall offer
a few reflections that will be of use to you
in the following parts of our Course. but

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I see our time is gone so that I must refer 'em till tomorrow morning. —

Lect.r 6.th —

I know Gentlemen that it is not agreable to engage students at the beginning of their Studies in too much general reasoning and reflexions but that of yesterday was unavoidable, because as you form your judgement of this Subject your conduct will be hereafter. I know that some Gentlemen are sufficiently hasty and rash in deciding, and will determine for me what are the more or less important parts of the Course. I therefore thought it was necessary to give some general notion of the two Schemes as I may call them of Physic the empiric and Dogt plans. I did this to shew the advantages and disadvantages of both, and from the whole I think you will perceive that either plan taken by itself is insufficient and improper, the empt. plan is not sufficient, and the Dogt. plan taken by it self is far from being safe Dr Cullen in his Pathology is venturing to assert that if the ancient empirics were now to return they would certainly form a combination

of

of the two, and I think that to be the opinion of most writers of Judgement at present in Europe and this imports the Conduct that we are to follow. I am to take every fact that empiricism can afford us, and with regard to the Dogm.t plan I am to so establish this into general facts, so that my general Doctrines are to be only so many general facts. when Gentlemen call the course a Course of Theory, if they mean by that term a deduction of reasoning, and that founded upon Hypothesis we refuse the appellation, but if by Theory they mean the general Doctrines of any art founded upon experience and observation as much as that of empiricism is I allow you to call it the Theory of Physic. +

I propose to give you 2 or 3 reflexions indepen.t of particular instruction, and I cannot avoid giving you them still, very shortly. My first reflexion is that let human reasoning be as weak and as fallacious as sceptics have represented it, and the Dogm.t plan as fallacious as the empirics would have it yet notwithstanding the employment of our reason as in other human affairs, is here unavoidable, and there is no man, no sceptic himself

that

that does resign the use of it, and I have known a thousand professed empirics who every moment employed a Theory, and which was only so much the worse that they were very ill prepared for it, and no man truly is without it as a little observation will show, and the only safe use of it is to persons who have been much exercised to that reasoning, without that we can neither obtain the truth, nor be sufficiently cautious with regard to error and the man truly most exercise in it is always the most cautious and most limited in the employment of it. as it is unavoidable therefore I would have young Gentlemen to exercise themselves in medical reasoning betimes they will be rash and ridiculous at first but by degrees they will be more reserved. my second reflexion is that the study of the Theory of Physic is not only necessary for avoiding the Errors, but for acquiring the facts in Physic by comparing these general facts we come to learn what we have, and what are still awanting, and thus we attempt towards general principles catching at the observations that lead to

it

to it, and both in Philosophy and in Physic it is a Dogmatic System that has collected the facts that we are in possession of and it is the likeliest means of procuring more. But to conclude with a 3d Reflection, there is no other means of studying Physic, than by studying a Dog[matic] Plan, for there is no empir[ical] Plan laid before us, some indeed pretend to abstract from reasoning, but I could shew that such writings are in themselves frivolous and insignificant and that they dont keep their word but employ reasoning in every page, so that there is no plan laid down for an empirical System, and since the time of the antient Empirics, of whose manner of conducting their plan we are ignorant, it has only been taught upon a Dogm[atic] plan and no man can find out the several facts in Physic without meeting with such a plan, from all these considerations I with confidence enter upon delivering Physic upon such a plan, and I hope I will engage in some measure your attention and I shall endeavour to render every part of our Course applicable to the ultimate end of your Studies, the Cure of Disease & you will find in the practice, that y[our] Course

is

is considerably illustrated by the General Doc-
-trines of the Institutions, Having thus endeavour
-ed to satisfy you with regard to the propriety,
nay the necessity of the Instit: I enter upon
delivering 'em, and they are divided into three
parts

The first treats of life and health, the
second delivers the General Doctrine of Dis:
and the third delivers the Gen[l] Doctrine con-
cerning the means of preventing and curing
them. I have given already some Idea with
regard to the connexion of these several parts,
the first discovers to us the mechanism of
the human body, the second treats in what
manner that same mechanism is disorder-
-ed and changed when Dis: prevails, and from
a comparison of these 2 we see what changes
is necessary to be produced in order to restore
the health that is lost, this gives us what we
call our Indications, and the 3[d] part delivers
the Doctrine by which general means the
Indications can be answered, I think it is obvi-
-ous that as in Physic the whole of our con-
-sideration dipolves itself into these three
subjects, Health, Disease, & Remedy, there

can

can be no more, The first has been named the Physiology, The 2d The Pathology by every writer, with regard to the 3d part there is some doubt in giving it a name, but without hesitation, I call it Therapeutics. Some of you may obs. that the term has been confined almost entirely to the Study of remedies concerning these means employed in the Cure of diseases and with regard to the means of preventing the Dis: that has been supposed to occupy some other part, but you will see the use of the definition I have given you, I have told you that there is no art of preserving health but in so far as we prevent Dis: by preventing the defects or errors that have a tendency to Dis: as they exist only in their Cause before they produce their effects, but it is really and truly removing a Dis: and the means are no other than the remedies we employ in curing them, so that they may be comprehended under the title of Therapeutics, Having thus given my division of my institutions, I would observe that from the time of Galen to that of Boerhaave the Institutions have been divided into five parts, under the

title

title of the Semeiotica. and Hygiena but this is not necessary; for with regard to the Semeiotics this part is no other than a repetition of what is delivered in the Pathology in that part which explains the Symptoms of Dis: and so called the Symptomatologica. Therefore it is no other than the same Doctrine, and in effect it will not be omitted in our Course, and I cannot go further with regard to the Semeiotics till you are studying the practice, or till it is studied, so that it is to be a distinct study, it must come afterwards with regard to the Hygiena or the art of preserving health I have sufficiently explained myself, and I say it is merely the Study of the remote Causes of Dis: whether predisponent or occasional, or it is the Study of means for preventing or curing Dis: and therefore the whole that is comprehended under the title of Hygiene will be delivered in the Pathology or Therapeutics, the several means for changing the State of the System. So much with regard to the more general management of the Institutions: in different writers there have been different plans proposed, and there is one w^c^ from its author deserves some respect, that

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is the plan delivered by Dr Gambius. I should have a good many Criticisms with regard to it had I time for it. but it is sufficient for me to say at present that it will not suit my purpose, it will not suit my views of the Institutions, but I leave it to be considered at your Leisure as it is in your hands in his book. I have given the three parts of my Institutions, & with regard to each of them you may expect a more particular account when we are to enter upon them, as now in entering upon the first part entituled the

Physiology. I have given a Definition of this it is the Doctrine I say which explains the Conditions of the body. I need not say the human body, as it is supposed understood that it is our body, but I suppose that it may be extended to animal bodies in general and I mean that Physy considers the matter of which the body is formed in its mixt in its agregation, and especially in its organisation or mechanism, with regard to the condition of the body. Physy considers every thing that Philosophy, Chemistry or anatomy teaches with regard to it, but you are to observe

that

that Philosophy, Chimistry and anatomy consider the state of the body and its several parts abstracted from its several effects, and so far as it does so, I must suppose is known, the business of Physiology is only to explain the conditions which Chemistry or anatomy point out as applicable to the exercise of the functions I know that most Physiologists have introduced a great deal of anatomy into their Course, but in the Courses where we have had experience of it, it has always occupied too much of the time, and I must suppose it in a great measure previously known, whatever is taught by Philosophy, Chemistry and Anatomy, but when I want to point out a particular view I shall explain my Chemical views or anatomical principles.

I have added here a particular in my Philosophy that is not common. and of the mind, some persons may think that this is hardly done with propriety, but I must point out a little the sentiments of some other persons of great rank in our art as the late Dr. Boerhaave in the beginning of his Pathology where he is

again

again defining Disease very much the same way as in the Phys.l he has this remarkable addition he says nec mentio animi facta in hac Definitione, quia &c.

That is a proposition that I would not willingly admit, or advance in so absolute a manner but indeed D.r Boerhaave, does not do it absolutely for he adds

still insinuating that whatever is in the separate Consideration, and he declares that they are 2 perfectly distinct Substances he only means to insinuate that Physic operates only on the body, even

where he does not refuse that the mind may have a condition independt from the body, and that its disorders may not always depend upon the body

certainly he had in view some hypothesis arising in his time, which led him to inculcate that the mind was not the object of his

attention

attention but he is not consistent with himself, for he has his Chapter De Sensibus internis and however the condition of the mind may ultimately arise, We often do see conditions of mind arise that we cannot trace to a corporeal Cause while at the same time they may produce very considerable Effects upon the bodily State, so that it was necessary to say that Physiology referred to the conditions of the mind as well as of the body corporeal part, but I had something further in view, that so far from being able to neglect the mind, you will remember that the most considerable functions are connected with particular operations & a particular State of our immaterial part, & Indeed I find that if conditions of the human mind must engage our attention more than they have hitherto done, some indeed have thought that I have gone far in introducing a great deal of metaphysics into my course but unless the history of the operations of the human Mind is to be considered as such in some measure, they are mistaken, and I resolve to go no further than I can point these operations out as referring to the State of the body

but

but with that explanation I hold my definition to be properly founded Let us proceed to consider it further what is.

The functions — delivered. by looking into the various Physiologists you will see a proof of this and it will be easy to find out the reason of it, the functions are complicated and mutually depend upon one another, many of the functions with regard to one another may be considered mutually as cause and effect. Thus the action of the heart cannot subsist without the power and energy of the brain, nor can the energy of the brain subsist long without the action of the heart I am not certain therefore if I can find out the best method, but that organ certainly should be delivered first the knowledge of which is necessary to understand what is to come after, & that which considers the several functions according to the series of cause and effects, as nearly as may be for it is impossible to do this entirely but I say as nearly as possible. if the functions we are to enter upon is the cause of that which is to follow, I may take

that

that order, but what is that order, is as little determined among Physic.ns it is hardly necessary to say that few of their orders follow the rule I have laid down just now, and therefore that we cant follow them Dr Boerhaave has necessarily involved himself into several difficultys in this respect and also Dr Haller has many objections against that rule that we have proposed, In short we must enter into some view of the animal oconomy in order to find out in what order the functions are to be considered. I propose therefore to give such a view of the animal oconomy. It may be supposed that I am anticipating what I am to teach hereafter, but I suppose all of you to be in some measure acquainted with anatomy, and to have considered the use and functions of the parts, so that you may be in a condition to follow me with regard to the general view of the oconomy that I am going to take.

The circumstance that almost first presents itself in considering an animal body is that it is a congeries of fluids which are all confined within certain vessels. &

that

that these fluids are constantly changing, are constantly passing out, so that the real Identity of the body can't rest upon them, it is the Solids that give the fixme consistence, and the Stability to the whole System, so that it is necessary to consider the human Body as formed of a quantity of solid matter, as fundamental with respect to every function that can occur, I take that way, I take away the body itself and what relates to every particular function, & I have marked out first the consideration of the solid matter of which a great part of every organ and the body consists for in so far as it consists of fluids it may be neglected till afterwards, when we wond employ that in the several functions, I say the most remarkable organs are the muscular parts, a very small acquaintance wt the body shows that there is hardly any sort of motion respecting the action of the functions which is not performed by Muscles, or muscular Fibres, so that must be of very fundamental Consideration wt regard to the animal economy, when we trace the matter further a little anatomy must teach us that their is not a muscular Fibre that has not a connexion with nerves, and this

connexion

connexion with nerves is necessary to the action of the muscular parts. for compreping or cut-ting thro' these nerves destroys the action of such muscles, & they must not only be connected with these nerves, but by these they must be connected with the brain, for the nerve being cut thro' in any part of its Course it destroys the action of the Muscles and when we consider what it + is in the brain that is this connected, we find that by much the Greater part of the muscles of the body do not stir unlep there is a certain operation of the mind that we call the will which excites and directs the action of almost ~~all~~ every muscular ~~part~~.

We trace the matter still farther, the will may be primary and independent but at the same time we can for the most part very clearly perceive that the will arises in consequence of sense, unlep I see you be-fore me or unlep at least I imagine you present before me, I will not open my mouth to speak. it is the sight of some agree-able object that determines my will to put forth my hand and bring it nearer and it is the feeling of somewhat disagreeable,

That

that must direct me to put the object from me
so that in most cases, the will again depends
upon Sense. In the next place we may enquire
what Sense is how it arises, and we can perceive,
that it depends upon the extremities of certain
Nerves expanded upon particular parts of the
body, and fitted to receive the Impulses of
external Bodies. which acting upon the
extremities of certain Nerves, gives what we call
Sensation and this at last produces Will:
further Their is an impulse upon certain
Extremities, but, These again are connected with
a Course of nerves that Ultimately end in the
Brain. For if the Nerve between the Brain &
Organ of Sense is cut Through, or otherwise de-
-stroyd, all Sense ceases, so that in the funda-
-mental Operations of the Human Body, the
Nerves, and the parts connected with them are
especially concerned, & it is the Brain and the
nerves thus connected, that we call the Nervous
System, & it must be a very fundamental one
it being the N. S. in which the motions of the
Body for the most part begin from the Im-
-pulses of the external Body on the organs of
Sense so that I think it is with some Propriety

that

that I have allotted my second Section to treat of the N. S. in which the motions of the Body for the most part begin and on which the motions produced in it mostly depend we consider this as it is acted upon by other Bodies or as it acts upon these But further we must by looking into the Body observe that there is a great Part of it made up of Fluids and that these are in constant motion and this in a certain Train or course in the Circulation of the Blood and we observe that the exercise of many Functions is strictly dependant upon this so that the Circulation of the Blood may be considered as a principal Part of the Animal economy, and as the fundamental part of it. It may properly come to be examined in the next place and therefore our 3d Section treats of the motion and Circulation of the Blood and of the several Organs and actions employed in supporting it. for a long time past since the Discovery of the Circulation of the Blood most Physicians have viewed this as the vital Functions upon which all the rest depend and perhaps there is not one entirely independent of it &
independent of it and therefore I have stated

the

the Question the action of the Heart depends upon the Nerves and these upon the Brain so that the heart depends upon the energy and action of the Brain But the Brain would not long be capable of its Functions if it was not for the Circul. of the Blood. so that it may be a Quest. whether they are not both vital functions and which of them is the primary. Some have decided in the Favor of the action of the Heart but the heart as a Muscle must depend upon the Brain, and before the Circulation could perform its Functions and the Blood could be powred upon the Brain, the Brain must have acted upon the heart. —

Lect. 7th —

In entering upon the Study of Physiology Gentlemen a great number of observations immediately present themselves. and it is necessary that these be taken and delivered in a certain order, but what is the most proper we may suppose difficult to find from this consideration that there is no one System of Physiology that is not in this respect liable to very great objections. It is obvious that this must be a general rule, that we should take the several matters with some view to their

dependence

dependence upon one another and that sh.
be delivered first that is necessary to the un-
-derstanding another function that we sh.
suppose nothing known that has not been
previously explained. This we obtain most
easily by following the functions in the
series of cause and effects. however with reg.
to this there may be disputes, and we cannot
find out in what train or series the several
functions are to be considered without taking
some general views of the whole, and I
was yesterday entering into such an ana-
-lysis of the animal economy, in order to find
what are the primary and what the depend-
-ing functions the solids we find to be the
substratum of all, and the functions will be
influenced more or less by the condition of this
matter, so that we cannot consider a function
without considering its organ, and we can't
consider a single organ without considering
in general the solid matter of which it
is formed. —

I was next considering the general effects
of the functions in motion, and the connex-
-ion between sensation, volition, and the
motions

motions arising in the body. we say the motions arise for the most part by sensation, that this produces volition, and it is in consequence of the different modes of volition that the actions of the muscs are produced, therefore the consideration of these must be fundamental with respect to every thing else, but this subj.t considered more nearly we perceive, that they are all connected together by depending upon parts forming the N. S. and therefore the consideration of the N. S. must be a fundamental part of our Physs.y but even this subject is like the other we have marked out a very general one, relating to every several function of the body when we proceed to consider the effects in the funct.s nothing can strike us more than the circulation of the blood, than the motion of the fluids in every part of the body in a certain course, when we consider this, and see that this motion is universal with regard to every pt.s of our body, and that it is necessary to the performance of almost every other function and even to the support of the functions of the N. S. that we have said may be considered as Introy from hence the first functions to be considered as 1rily would appear to

be

be the Circul. of the Blood and the action of the heart and other organs employed in carrying it on.— Hitherto I have proceeded in making out the first sect: of the Physiol but the consideration of the circulation of the blood, which must be taken abstracted from the nature of the fluids, naturally leads to the consideration of these, and while a considerable quantity is necessary to be present there is a daily waste, for we find by experiments that the body loses of its weight and that especially by a waste of the fluid parts, we readily also perceive another demand for a quantity of fluids The body from a small beginning arises to a considerable Bulk, and all this in a certain course of life must be by a quantity of matter added to it, and we can find no other Source for supplying this growth, but the matter taken into the mouth, which common observation presumes to be for that purpose, and calls them aliments, but they are not of the nature of the Body: and must be converted into the same nature by the body itself, so that we must be led to consider the body as supplied and supported by the aliments and consequently the functions necessary to convert the aliments into the nature of the animal fluids.

for

for forming a variety of fluids and particular-
-ly for supplying the growth of the body or
the several wastes that is supposed in it There-
-fore we come next to consider the several funct-
-ons necessary to support and repair the seve-
-ral parts of the body whether solid or fluid,
and also the nature of the several fluids them-
-selves, and this having given such a view
as points out the several functions, and
that in the order in which they are to be con-
-sidered, and I would take notice that Physio-
-logists having established distinctions of the
functions, in referring them to three Classes
or Heads. The vital, natural and animal
funct. we find some difficulty in referring
the different particulars to these heads, but
in the main it is an obviously just division
The vital funct: are those that are more
immediately necessary to life and without
the exercise of which life could not be sup-
-posed for a few moments with regard
to these there has been some diffe.t of
opinion while since the discovery of
the Circulation Physit.s have been disposed
to consider the action of the Heart and

the

the function of respirat: in this light, but as the action of the heart itself is depend:t upon the Energy of the brain this must be considered also as a vital function, and the primary one, but we are now following that order, we have begun to consider these very vital funct: which will be explained in our 2 & 3 §. The natural functions are necessary to life, but they are not so constantly and necessarily req: a man may fast for a length of Days without dying, tho' y: continued to be sure will destroy him and if ~~it is~~ the aliment is not properly transmitted to the blood vessels, the same will ensue, as if the Thoracic Duct. is cut thro: therefore they are next in point of necessity to the vital we spoke of, and so they came to be considered in the 4th § but with reg: to both they are such as are necessary to the being of the body, and to its subsistence, but there are a certain set of functions for which the body is made & supported, and which form our connexion with the rest of the universe by which

other

other bodies act upon us, and by which we act upon other bodies. These have been called, Animal Funct: and the fundation of the whole of these is to be deduced from the nature of the N. S. and these animal Functions reduced to the two heads of sense and motion will be explained in our 2 Sect. but it was not proper to carry the matter there to the consider of the Exercise of the particular senses and motions, and therefore have we reserved these for this place where we are to consider 1st Sense as exercised by its principle organs, at least, and than we proceed to the consideration of the organs employed in receiving and modifying the sensations, and the functions of these organs, and then we are to consider the motions that have not been previously explained the other part of the animal functions therefore depending upon muscular motions which are chiefly directed to our acting upon other bodies we consider in our 6 Tits & under these 6 titles we will I think exhaust the whole of the functions of animal bodies that are in common to every animal,

but

but the human species in particular is dis-
-tinguished by sexes, which have each of
them somewhat peculiar to themselves, we
therefore next proceed to consider these func-
tions peculiar to each sex by the concurrance
of which the business of generation is carri-
-ed on, and under these heads every title
that has been admitted into any Phys.l
or can be mentioned as a particular func-
-tion may be referred. It will be obvious that
a complete Phys.l should treat of every one
of these particulars, but there is a very con-
-siderable difference with regard to their impor-
-tance and their generality and hence their
importance on that account and I have
found that the subject is so extensive that
to treat it in its full extent is impossible
in this Course therefore many particulars
must be omitted, and I must especially
seek for and explain to you the more gene-
-ral laws of the oeconomy, which are of
most consequence in the after parts of
our system in the Pathology and the
Therapeutics, with regard to every thing
that can be said to belong to the uses.

partium

partium singly considered by themselves, is commonly strictly connected with a view of the Structure which anatomy teaches and it is inseparable from the anatomy, so that I must suppose you to have learned a great deal to that purpose, or I must again send you back for it e. g. the actions of the body as depending upon muscles, are known from the Situation of these Muscles, and for this I must leave you to have recourse to anatomy for it, and so with regard to the fifth Section that treats of the functions of the particular organs of sense, e. g. of the Eye, if any body is acquainted with its Structure, and has acquired a few of the principles of optics, the Doctrine of vision will be extremely easy, and it is not necessary to employ your time here with it. But w.t regard to every thing that can relate to the oeconomy more generally, I shall explain it as well as I can, and as fully as possible. —

Hitherto I have been speaking of the preparation that is necessary to the understanding of certain parts, with

reg.

regard to the whole. The human body is a machine that must be governed by the laws of matter and motion, that affect every part of the nature, and therefore to the understanding of it some of the principles of natural Philosophy are very necessary, and I do not know where Gentlemen have a better opportunity of acquiring the knowledge of these in the most fundamental manner than in this university and the knowledge of Chimistry so far as it considers the nature of the body and of the fluids will be likewise necessary, but especially the knowledge of the anatomy must every where accompany our present study, & I must suppose you all instructed in that respect, and if you are not, it would be impossible to supply it. for the introducing much anatomy here has been found to be lost and superfluous labour, but in some Cases I must point out the particulars of the anatomy I refer to, and I wd wish upon such occasions that you would have recourse to your anatomy yourselves, and for y.r purpose I would

have

have you to have in your hands Dr. Hallers Prima Lin: Phys.ly There you have the anatomy in the best condition as it is there accompanied with the Physiology, and I shall refer to it in several places, and you must prepare yourself both in the anatomical part and in the Physiological, the first you will find very correct and complete, with regard to the latter I will frequently differ from it, but I would not have you to receive my sentiments implicitely I would wish that every Gentleman would consult the same subject as it lies in other hands and this will serve either to put you into a better train or to confirm, what I have said, and I cannot direct you to better hands than to Dr. Haller, he has given a larger work in 8 quarto vol.ᵉ all bestowed upon the Physiology I would be pleased if the Gentlemen who attend me had read this, or would read it now, but I am afraid that few have taken the pains to peruse it before, and it is impossible for many of you to read it along with this Course but in so far as you can, you will find

the

the several different opinions there discussed,
and by comparing these with wt I deliver,
you will be able to apply your own Judge-
-ment, so much in general with regard
to the Physt and I now enter upon a
particular plan. I mark out my first Sect.
as § 5. Treating of the simple solids which
I must explain a little. The common notion
of a simple solid is that it is that part of
our solids into which we find them ulti-
-mately divisible, and of which we suppose
the more complicated parts formed, and
if there is such a distinction, you will
readily see the meaning of the term tak-
-ing it in this view. Dr Boerhaave, &
the most part of his followers have given
us this Idea of it, that the smallest Portion
is what we call a fibre i.e. a solid mat-
-ter that has a very considerable length wt
respect to its breadth, and is therefore
called a Fibre or Thread, and by an inter-
-texture of these very much resembling
according to their gross Idea of the mat-
-ter, the texture of a piece of linen Cloth
was the most simple membrane formed.

That

that if this membrane is formed into a hollow
cylender or cone it gives us one of the most
simple vessels. There however they had only
reached what is rather obtained by conjecture
but to explain the more compound parts
they supposed that the vessel stood in the
place of the fibre, and yt. of these a mem-
brance of the 2 order was composed. &
of that a vessel of the second order. and so on,
till that of a membrane composed of larger
vessels, one of the viscera was formed, and
it is obvious why the fibres were considered
by them as the simple solids. But later
anatomists will admit of no part of this
they say that there is no such membrane as
that I have just now described, either of the
first or 2d order. that the whole is formed
of cellular texture, only that the smaller
vessels is formed of such a membrane but
thinner, and the larger of the same membrane
but of a thicker and proper consistence.
Please take notice of D. Haller upon this
subject who has taken a great deal of
pains with regard to this Idea of the struc-
ture upon the Cellular membrane, it is

in

in his 11th paragraph, where he is observing what Share the vessels have in forming the membranes. Vasa &c. in that passage and in his larger work, and in some of our modern anatomists, I say that this view of the matter is very generally prevailing, and in a part of Dr. Gaubius, we find that he deserts the whole language of his School, and in his whole treatise de Solidorum Simplicii, he only mentions the term Fibre once, and commonly uses the simple term Solidum. But you must obs. that I am not here determining, in speaking of the simple solid, any thing either with regard to its matter or form. I use the term simple solid, not as necessarily importing that part of which the rest is composed, but I am to consider it as a substance in common to the more simple or compound parts, and I have said in the 7th paragraph. That the solid parts &c. but I must say what that special property is, it appears with respect to their contractility or elasticity, we find that every part of the body is endowed with a contractile power in its extended state, and upon taking away the stretching powers it evidently con-

tracts

contracts itself to its former dimensions,
These properties are very general in the a-
-nimal solid. and it appears both in its living
and dead states, for there is no more elastic
† substance than a piece of Catgut. But
there is another part that has the same
contractility and elasticity upon a different
footing, it can be brought to action without
an extending power applied, in whatever
state we find it. it can be brought into action
by powers that have no effect upon the dead
solid. In short I particularly have in view to
distinguish simple solid from moving fibre
from muscular fibre, and they are distin-
-guished from the Condition of their con-
-tractility and elasticity, in the living solid
there is reason to suspect that a peculiar
organisation, or some peculiar addition
does take place, and it is in opposition
to this that I call the other the simple solid.
If we enquire whether this appears among
the simple matters in the vegetable &
fossile Kingdoms, in the fossil no such
property does appear in the vegetable it does
appear, but it is strictly confined to the
living

living state of the vegitable, and that ceasing the vital property ceases, in this way the meaning of living & simple solid will be sufficiently understood. It is the simple solid that I am only to speak of, in this Sect: & it will be necessary to refer the other to be considered. qr. we come to consider the N. S. in the following Sect:. Having thus ascertained what we mean by simple solids, I go on to enquire into its functions, and I say that they are suited to the purposes of the animal œconomy by a certain force of cohesion joined to a certain degree of pliability and elasticity, the meaning of the terms is I think sufficiently obvious, and that these are necessary properties will be as readily perceived, as the functions consist in motion, it is the solid parts that are chiefly there concerned, and there are very few motions that can be performed without a change of the position and extent of the solid parts by stretching them out, but that must take place without the loss of continuity and so with a certain force of cohesion, and the

explanation

explanation implies a Cohesion with a certain degree of Flexibility. I take the matter with regard to the fluids the solids from the Vessels containing and confining those fluids and the fluids are in constant motion but with unequal impetus and in unequal qty. when therefore at any time the impetus or qty is increased, it is necessary that to a certain Degree the vessels should be flexible and yield to the increase but it will be improper that they should retain that form, that they should be possessed of a flexibility of the waxen kind. no, when they have yielded they recover again their former dimensions, therefore an Elasticity is absolutely necessary. This is sufficiently simple, if you would have it a little explained further you may look into Dr. Gaubius for it, in his 150th paragraph Idea solidi &c. he next points out that cohesion must be of a middle kind neither of the Lapidea Duritties that will not yield to the various motions in the Solids themselves, nor in the fluids themselves, but must be connected with a flaccidity on the one hand, and that must be joined again with an Elasticity as in the 153 paragraph. From a very little consideration it will appear that these

are-

are the necessary properties, a certain Degree of Cohesion joined with a certain degree of flexibility and elasticity, and the more you enter into this Subject you will find that these two are the whole of the properties that we have occasion to consider.

Having ascertained our subject we should proceed to consider the cause of these properties and of their different Degrees in Health and sickness, but to me the causes either in gen! or in particular, are absolutely uncertain. the Cause of cohesion in general is not a matter that is yet agreed upon by Philosophers. nothing has been more common than to say we account for Cohesion by attraction, but this is merely a language, it is only a term for a general fact, and it is only another term for the same thing, we must therefore enquire into the Cause of attraction, and there we should meet with some difficulty as Philosophers are not agreed whether they should allow only that it is a first cause in the material world, or if it is somewhat in the Series of Cause and effects we should find some difficulty in saying what it is but this

not

not being necessary here I avoid it. and tho I have my conjectures with regard to it, yet are not now to be detained with them but there are some parts of our System that leads us further in this enquiry and there we shall say what we may with regard to it, and passing by the general cause, the particular cause must be equally neglected. why the animal Solid is of that particular Degree of Cohesion &c. that we find it, we can say what is the mixture of it but why it should give this particular mode of Cohesion is not easily explained. In short I avoid the question with regard to the cause of that particular Cohesion that prevails in animal Solids but I shall say in what manner we are to proceed in considering the causes of the diff.t Modes of them to morrow

Lect.r 8.th —

We are now Gentlemen fairly entered upon our Subject and have begun the consideration of the first Sect.n which is to consider the Simple Solids, I have in the first place given the meaning in which I employ this term it is not in the meaning

of

of Dr. Boerhaave the simple solid taken for the simple fibre as the most simple part of our solids, & of which all the rest are composed I have given reasons why it was not proper to enter into that discussion just now. By simple solid I mean an animal solid in opposition to what Dr. Gaubius has called, solidum vivum and which we translate vital solid. and we distinguish these by certain properties, I have particularly pointed out what that differ. of propert⁹ is you will see is more particularly explained, if you look at the 93 paragraph of our Book, which you may consider at your leisure. Having thus ascertained the meaning of our Term, I go on to observe that the properties of the simple or inanimate solid is suited to the purposes of the animal economy, they are a certain force of Cohesion joined to a certain Degree of Flaccidity and elasticity, and I add that these are the properties which we are especially to consider and they are the whole of the properties that we have occasion to attend to having said so we should proceed to enquire into the causes of this, that we might learn the conditions of them,

but

but I say that the General Cause of Cohesion is either not known, or at least it is a matter of such subtility as renders it not proper to be mentioned, now, and it is not necessary to mention it, because in any explination it is not applicable to our particular purpose, so that I avoid the consideration of the cause of cohesion, and of the other properties. And as we must neglect the consideration of the Gen.l Cause, we must also neglect the particular cause, of the Cohesion and flexibility or elasticity that is found in the animal solids and all we can attempt is in some measure to explain the differ. that occurs in the Coh.n flexibility and Elasticity. Here I must make a general observation that this sort of treatment runs thro' the whole of the Physt.l we have no where any knowledge of what we call the absolute state but merely the relative, ~~xxxxxx~~, we have, no measure of any other property and we merely can say that it is in different conditions, & from whas causes. This we know that Physiologists, mathematical Physiologists especially, have taken pains to ascertain

The

the force of the Heart, and they are not yet agreed with regard to it. and I doubt if any one has determined that force with any sort of accuracy but I say that we are very little concerned in the absolute force of the heart, all we need to know is what increases or diminishes that force, and so with regard to several other particulars after all the pains taken to ascertain the Issuing out of the blood, we dont know with any sort of exactnep its velocity &c. but we know what does increase this velocity. so we have no measure of the sensibility of the nerves, or what is necepary to produce sensations, but it is enough to know what does increase their sensibility, so with reg.d to the simple solid, we don't know the cause of Cohesion &c. but we may find out the causes of the Degree of these properties, and it is upon that footing I say in the 9th paragraph that these properties &c. this is sufficiently obvious that these properties are different in different parts of the same Body, as bones, Cartilages, ligaments, tendons, muscular Fibres, where you have a series of parts, different in their Degree with respect to these properties, so

the

the Dura mater pia mater the membrane of the vitreous humour of the Eye which all differ in their degree of flexibility &c. so with regard to other parts of the body so that these properties of the simple solid are different in different parts of the same body They are also diff.t in different Bodies, as in a dilicate woman and a laborious rustic, and they are not only constantly diff.t in different bodies, but any one of these bodies being given upon different occasions the properties of the Solids are diff.t whether you take the bones, Cartilages, &c. They are different in an Infant and in an old man, and they are differ.t from different causes in the same period of life. they must therefore be considerably different. This however, how far the simple solids are liable to any considerable change, but from the progress of life, has been disputed. and it is not necessary for us to enter into it just now but we could say that there is a cause that will have effect upon a portion if not upon the whole of the simple Solids, but what we have chiefly to attend to is what is pointed out by D.r Gaubius in his 153 paragraph the conclusion of which is vis cohesionis &c. &

now

now I say then that it is the cause of these differences that occur in the same person, in different periods of life and in different parts of the body, and in different persons, and this seems to depend upon the differ: of the mixture, aggregation or organisation of the solid. This may appear obscure, but it is not particular to this subject, but the properties of every body must be found to depend upon a difference in the mixture aggregation or organization of the solid, to these three heads all the properties of bodies may be referred. I should suppose you acquainted with these terms from the study of Chemistry, but as I know the Mass of Chemical Students well enough, that you are apt to attend to particulars, rather than general views I think that it may be necessary here to explain these terms of mixt. aggregated and organised bodies. A mixed body is one that can be resolved into different parts each of which differ in their properties from one another and each of them also differs in its properties from what the whole mixed had before resolution from

from our finding in many cases that we can resolve bodies into parts, which again being put together make up the same body, such parts are called the constituent parts of a mixt: an aggregate body is a sensible mass of matter that we can divide into a g^t. number of smaller parts, but commonly with this condition that these smaller parts, except with regard to bulk and accidentally with regard to figure, but with reg. to their properties, they have the same with that of every other part, and each of them has the same properties which the whole aggregate had before division, & as the parts into which the aggregate was divided has the same properties. & gives a presumption, that in each of them these are still entire they are with respect to the aggregate called the integrum parts. The organised body again is when an aggregate gets a particular form, has the parts so arranged and formed. that the arrangement texture or form as you please to call it acquires certain properties w^h depend upon the form of the aggregate,

&

and when it thus acquires certain proper-
-ties it is called an instrument and such a
body is called an organised body, for example
in order to make it better understood. for this
purpose I take a piece of the stone that is called
Gypsum, or common plaster stone, by Chemis-
-try I can resolve that into vitriolic acid, &
a Calcarious matter, with regd to these
matters we say the Gypsum is a mixt
the two parts being very different from one
another and from the propeties of the Gyp-
-sum before the resolution, and we know
that when we can resolve such we can of
these simples reunite and form such a
Gypsum as that nature presents to us, &
therefore these two are said to be the con-
-stituent parts of Gypsum considered as a
mixt, but if without the application of
such a proces, you take a piece of it, and
break a moderate mass of it into a thou-
-sand parts, except with regard to the bulk
and perhaps the figure, they are still of
the same properties, every one of them is
exactly the same, and have the same proper-
-ties as the whole Gypsum had before

division

division, for we can resolve each of them se-
-parately into the same constituent parts
and can renew the General form. This then
is called an aggregate, and the parts into which
it is divided are called integrum parts but you
know that it can be formed into any thing
at pleasure, as into a Cylendrical Tube, and
by giving it different bendings you can employ
it to trans mit fluids and in a given time,
and in a certain direction, and in this re-
-spect it is an organised body, because the same
sort of Instrument might have been made
of metal Stone, or Glass it will be easy for
you to supply other examples that will equal-
-ly illustrate the consideration you will there-
-fore understand what we mean by mixture
aggregation and organisation, and the fur-
-ther you consider it, the clearer you will
perceive that the whole of the properties
are referrible to it, mixture is the object
of Chemistry, organisat: the object of
Mechanical Philosophy and aggregation
is the object of Chemistry, but may be
the object of mechanical Consideration
also. —

Having

Having explained these general positions we go on to enquire into the mixture, aggregt. and organisation of simple solids, and how these may alter the Cohesion, flexibility, and elasticity they possess, But before I go further I must mention what has been the common Idea of the mixture or composition of animal solids, that has been taken from Dr. Boerhaave tho he himself was more reserved with regard to it than van Swieten, or Haller or Gaubius has been, see the 21 aphor. of Boerh. & the 3, 4, 5 & 6 paragraphs of Haller If any portion of animal substances is exposed to the action of the fire we find that there remains a part absolutely fixed, which appears to be a pure earth. so as animal substance exposed to putrefaction, it is resolved into a similar earth. Hence Dr. Haller with the whole of the Boerhavian School concludes that an Earth is the steady substance of an animal solid, but there must be some means of uniting the different parts which Haller explains in this way, Terreo molecula non a scipsis, sed alienter posito glutine vinculum habent, his proofs are Docent &c. vid. § 2. when you have driven away all

the

the parts but the pure Earth, if you add water or oil, it gives it in some measure the Cohesion that it had. he adds further, tum demum et ipsa — restituit. by the use of Papins Digester. e. g. it gives out a Gelatinous matter, and the remainder becomes more friable, & resembling pure Earth. and that this may appear more certain he adds further. sed os — constituit, that you will find disturbs his System very much he goes on to explain the composition of the Gluten. Hoc Gluten — artificium, and in the following Sect: he concludes again in a more simple view, Ex terra — adingit. This is the notion that the animal Solid is formed of an Earth cemented together by a Glutinous matter. But I cant any wise admit of the Doctrine, and indeed I would say that it is altogether mistaken, it proceeds upon false notions in Chimistry, the notion of the Cohesion of bodies depending upon a gluten or cement is very universally false, in most instances we can perceive that the Cohesion of bodies depends upon a certain mutual relation between the parts, which has been called attraction, but that is only a term

for

for Cohesion, it is only a Disposition in these two to unite together and in this both the parts are mutually and equally concerned & the one of them cannot be said to be a gluten more than the other ^there is nothing glutinous in vitriolic acid, or coherent in calcarious earth Earth, yet both taken together they remain very firmly united, and the notion of the Cement is a false one commonly entertained by Chemists, who supposed that every property that we observe in bodies had some ingredient to which it might be referred Mr. Boyle has with great force of argument expladed this Chemical notion & they have of late had recourse to some power of Cohesion. I cannot help illustrating this by some particular nearly relating to our subject Dr. Gaubius when he is giving his analysis chemica generalis. says that the human body consists of fluid and solid, that the solid consists of 3 kinds, Inflammabile, Salinum, terreum, with regard to the Terreum in the 137. paragraph he here says, terreum totius &c. he says that it is this that gives to the whole whatever Density or Stability it possesses

This

this is the language I say of the older Chemists that if there is a salinum there must be a solid. but there is no foundation for this let us consider the very earth we are speaking of, they by burning resolve the bones into an earth, it is purely calcarious, in common language it has no Coherance of it self, and if it is to be formed into limestone, it must have fixed air joined to it Dr. McBride has pushed this further saying that this fixed air is the Cement of bodies tho it is only an elastic fluid of itself, & saying so is purely a gratuitous supposition, but united to an alkaline salt it assumes a firm consistence and united with a calcarious matter it gives a firm consistence of marbles, but that is from a relation between them, and it would have been very favourable for their supposition if the Calcareous matter had been a calcareous earth but it is only a saline substance, in which the Earthy principle entirely disappears. & if a late discovery shall hold good that a certain acid and pure water forms a flinty indestructible matter, and yet there

is

is no principle of Earth in it, no. it is agree-
-able to the whole of the Chemical Physiolo-
-phy not to refer the properties of mixed bo-
-dies to any one of their constituent parts,
but to a properly arising purely from
combination, and not existing in the sepa-
-rate parts. Therefore the seeking Cohesion
in one particular Ingred.t is without
foundation, and so the seeking it in a
particular gluten is generally ill founded.
However I must not say that it is univer-
-sally ill founded, there are bodies formed
upon this, as our common Cement which
is formed of quicklime and sand, and here
it is the quicklime that is the Cement that
unites the sand. and if you take Dust &
add glue you form a consistent mass, &
perhaps nature does so in certain instances.
But I must here return to give another
part of my Definition, to distinguish
aggregates into

Homogeneous aggregates, and into He-
-terogeneous aggregates, in the former of
which every part is the same with regard to
any other or with regard to the whole mass

but

but there are parts that are seemingly diff.t
such as what we call free stone chiefly con-
-sisting of sand, but having a clay interposed
that is a cement with regard to it I would wish
to banish the common Chemical Language
of referring the Cohesion of bodies to a par-
-ticular part, but there may be heterogene-
-ous aggregates united by a certain power
but I say in the 10 paragraph that the mat-
-ter in the simple solids, except in the bones
which are a portion of the Heterogeneous
aggregate consisting of bony matter depo
-sited in the Cells of the cellular texture, but
every where else it appears to be an Homog.s
aggregate, and there is no proper evidence of
its being formed of certain parts naturally
+ discrete and incoherent. which are cement
-ed by others of a different nature according
to the Idea that Dr. Haller would give us in
the parts I have read. and the resolution of
such matters by burning and putrifaction
are not a fair analysis I appeal to the whole
of the modern Chemists. that neither the
fire, nor any mode of ferment: does fair
-ly resolve bodies into what may be called

their

their constituent parts, it constantly makes a decomposition, a jumbling more or fewer parts together under a new form of mixt so that according to the present Doctrines of Chimists our resolving an animal matter into an earth, is no proof yt that Earth subsisted in the same form before resolution, nor because we extract a Gluten is it a proof yt yt gluten did subsist in a separate state as in a Heterog. aggregate. I say therefore that the resolution in this respect is demonstrably unfair with regard to the resolution of the whole, & in such cases we always require this proof that these separate parts being put together should renew the former mixt, as in the case of Gypsum, but I say that it is not true with respect to animal Solids, Water put to a dry body, and still more oil will restore some degree of Cohasion, but it is no more an appearance such as existed before than if you take any earth or vegetable substance which is equally subj. to the same experiment, & there is no proof of any such structure, of any such Composition of animal Solids and it has led to several false reasonings

D

and conclusions. I would therefore present you with a different Idea, that the simple solid considered as an Homog.s aggreg. seems to be nearly of the same kind in all the different parts of the body, excepting the bones. for we can observe no difference of parts, but one uniform transparent substance, and I mean to say that the constituent parts are the same only differing in their proportions & further I say that it is the same sort of mixt that appears in every different animal there may be some dispute with regard to this but it is true without the least suspicion of exception in every kind of quadruped, that has two ventricles of the heart or any degree of brain, so in quadrupeds Birds, and I believe in Fishes, and vermes only perhaps with some differ: in the proportion and more perhaps in the aggregat: and this is not an Idea at all peculiar to me Dr. Haller has given the same in his 15 paragraph he is giving an Idea of the format: of the whole solid parts out of a glutinous matter, and he concludes, and in universum omnes glutines it is all one with regard

to

to his opinion respecting the matter of which it is composed, he maintains that every portion of the human solid is made up of the same matters, and he carries it further than I do, for I consider the bones as in some respects different from the other solid matters, I confine myself to the soft parts, which are every part except the bones, and I say so far as our observations have gone the mixture is everywhere the same differing only in the proportion of these, if it it is alledged that the different animal substances in them there seems to be some diversity I say the variety is very inconsiderable and does not require any attention, and I say that this homog.[eous] solid over the body is a mixt of one kind which may be called the animal mixt, it is found by Chemical experiments to be different from every kind of vegitable or fossil matter as in my 12 sect par: & in what respects it differs I have had occasion to point out in an after part of our work viz. paragraph 213 I have before reduced the consideration that is necessary here in the comparison of animal, and vegetable matters

&

and here I give the properties of each of the ve-
-getable in 2dly, and of the animal in the 2dly. that are
in the opposition to the former and I say that
none of these are to be found in any degree
in fossil matters. ——

But you will be prepared against next
meeting to consider the subject Gentlem.

Lect. 9th ——

I expect Gentlemen that in most parts of
my text you will observe plan and order
aimed at, i. e. that matters are delivered ac-
-cording to their connexion and dependence.
I wish that you may observe that, and
that you may do so in some measure I shall
frequently recapitulate shortly what I have
said to point out the connexion and depend-
-ence of the several parts. Thus I have said
that the properties by which the simple
solid is suited to the purposes of the ani-
-mal oconomy are these, a Degree of Cohesi-
-on joined to a certain Degree of Flexibility
and Elasticity. With regard to the cause of
these properties in gen.l I say that they
are either not known, or at least not agreed
upon among Philosophers and therefore

are

are not to be attempted here and much less are the causes of that degree that we observe in animal Bodies. But we observe that these properties are considerably different in different persons, and in different circumstances and may be increased or diminished. and it is to be wished that we could determine the proximate or remote causes of these differences, and this runs thro' the whole of the Physiology, we cant often determine the causes in general, or the absolute measure and standart, we can only observe the causes of the Increase or diminution, and it is these that we are chiefly interrested in. as with respect to the force of the heart, it is only necessary for us to know by what means that force may be increased or diminished, and so with regard to the simple solids, I say the differ: of the condition of y^e^ simple Solid, must depend upon a different of its Mixture Organisat^n^ or aggregat^n^ and for such persons as do not understand these terms I gave you a short explanation of them, and I say that all the properties that we can consider in bodies are the effect either of their mixture,

orga-

organisat: or aggregation. ——

With respect to the simple Solid we began with what relates to their mixture and I thought it necessary to say what is the common opinion upon this Subject, and I gave it from Dr. Haller, who has taken it from Dr. Boerhaave who has been followed in it by all his Disciples that it is an earthy matter cemented together by a gluten, This is the Idea that has ordinarily been entertained, but I thought it was necessary to say how far it was a branch of false Philosophy, and that it was shown to be erroneous by Mr. Boyle, and that it is now exploded by persons of the most sound Philosophy, viz. The accounting for the properties of any one mixt body from the pro-perties in its constituent parts, where-as it results from a combination, is the effect of Composition of Combinati-on, as we could illustrate by a thous? examples. The Cohesion therefore is not to be sought for from a partic-ular Ingredt in its composition,

in

in its gluten and then we must seek for the con-
-nexion of it in Earth, and so on ad Infinitum,
till at last we must go on to some cause of mutu-
-al Cohesion that is equal to both ingredients. But
there are in nature such bodies as Heterog. aggre-
-gation united into a mass by the Cohesive qua-
-lity of one part, but there is no proper evidence
of such a composition in the animal Solid, &
the resolution by burning, Putrefaction &c. are
not a fair analysis of bodies into there constituent
parts. the argument is altogether false, the Cala
reduced to burnt powder put into oil no more
makes a bone again than it does a piece of wood,
I propose therefore to give another Idea, and
say that the whole of the animal Solids, except
it is the bones, whose consideration we set a
part at present but all the rest and even a
proportion of the bones themselves is I say
a Homogeneous aggregate, in which there is on-
-ly one kind of mist and (x1) of the simple
Solid consid. —— every animal, at least all
these that are nearly analogous to the human
body. I gave you Dr Haller's Confirmation
of this and I give you the same in Dr Gaub:
in his 186 paragraph, as a deduction from

some

some reasoning before, that it is not proper to repeat, quare —— deberi, when I say it is a mixt merely ~~as~~ the same with regard to the constituent parts, these may be in different proportions; thus Corros: mercury and mercur. dulc. are one and the same kind of mixt consisting of a muriatic acid and mercury joined together, only that there is less of the mercury & more of the acid in the Corros. sublim. so when we say the animal mixt is the same in every part, we are to be understood in this manner, this cuts short all subtile Discussions with regard to a considerable Diversity in this respect.

Thus we call it the animal mixt, and we find it by experiments to be considerably diff.t from every kind of vegetable or fossil matter, I refer to a part of my text in which this is a little detailed, in the 213 paragraph. I am there trying to find the Changes in vegetable aliment, that are necessary to form it into an animal substance I must here premise however that in this paragraph I meant only to point out the differ. between vegetable and animal substances, but I may say that the animal mixt is distinguished from all kind of fossil matter

by

by this; that the animal matter is liable to all kinds of ferment: and the fossil matters are not susceptible of any kind of fermentation whatever. with regard to the difference between animal and vegetable matters it will be explained afterwards in the 213 I speak of the saccharine matter being the greatest part of the common matter of vegitables. and I say that it is different from the most part of animal matters in the following respects, which I shall just read without any commentary whatever It is readily quick lime. Therefore by comparing the 114 paragraph you may take the opposition of animal matters in from these respects known. In this may be the circumstance of the fermentation are the two distinguished as also by the Phinomina or products in Dectitation, where at least the ingredients are in a diff.t combination and are evolved in different Circumstances and 3.dly by the action of the fire. These few experim.ts go so far towards establishing a difference between vegetable and animal matters & we shall find these distinctions applicable on different occasions, but. to return, I

have

have added here, That the same Chemical Ex-
-periments hardly reach us any thing exact
or useful with respect to the constituent parts
of this mixt. The composition is yet unknown
to the Chemists They resolve them into salts,
oils, earths, &c. but upon the same footing
we are uncertain of these analyses be truly
a fair resolution, they are so far deficient,
That taking the oils, salts and Earths we can-
-not produce the smallest resemblance, indeed
here are new productions, parts are entirely
dissipated and lost, to an observation we know
it certainly with respect to air, I say therefore w.th
regard to this composition Chimists have
taught us very little, we have taken the notio-
-on we speak of ingredients of salt, oil, earth
but it is of no application, vegetables as well
as animals are resolved into the same. Chemists
have indeed attempted the Differ: of the pro-
-perties but it is not necessary for me to follow
them in their Detail, & I say That

XIII The only particular relative to this sub-
-ject which we exactly know is That the mix-
-ture or composition is formed of Water & some other Matter of animal matter con-
-ceiving with it, This is the Idea that Dr Lamb:
gives

give us in the first place with respect to the animal mixt in his 130 paragraph where he is attempting an analysis chemica generalis, what he means by limiting himself to the contrectabil: mat: is somewhat nice and difficult but here he certainly means that subtile matter lodged in the solidum vivum, and he says "Corpus humanum ex humido & sicco exquisite mistis constat" i. e. of water and some other matter concreting with it. With regard to the humidum he explains himself as I do, with regard to the other part, that there is no other matter in an animal solid we would hardly admit, but that is not necessary at present but the general position that the animal solid consists of water and a materies sicca is certainly true, that is of some other matter concreting with it. & Dr. Gaubius says properly in the 131 that the different properties depends upon the proportion and composition of these, and after his prosecuting the analysis in his own way, observe his conclusion in the 146 & 147 par.s in the end of the 146 he says with regard to the elementary parts, abundans siccum — determinat. I say that we can only in gen.l

obs.

observe that the animal mixt consists of water &
some other matters increting with it. Dr. Gaubius
proceeds to determine what these are in the 131
paragraph siccum ——, resistit. here is the
common Chemical analysis which is extremly
uncertain with regard to its truth and is of
no application I took occasion from the 132
paragraph to say with respect to the terreum
that it is very uncertain if it may be referred
to any particular part of the Composition.
I thought I could not do better than show you
that the terreum evidently does not exist,
may entirely disappears in several Cases
where it has been supposed, Thus if you
take a piece of marble, you can say that it
is a earth. or what is commonly called so, a
firm consistent body that is not soluble in
water, but if you consider it as a thing that
is indissolvible, it is doubtful, for there is a great
part of it air, and an alkaline salt soluble in
water, and whether this may be again resolved
into an earth we do not know. It is long since
we know that the Calcarious Earths were not
simple, but we were of opinion that the
flints were simple, and we did not know

that

that there was any means of resolving a Crystalline Earth; but we now know that it may be compounded of an acid and water and the tobius machina basis ac firmamentum entirely disappears so that we need not enter into the nature of the composition of the animal solids. and it does not seem necessary to our present question or enquiry with respect to the causes of the different force of Cohesion. for we find that on different occasions the Mass of the animal mass is varied by the proportion of the water to the other matter, and in the same proportion we find that it differs in flexibility &c. and whatever may be said against the Schaal Doctr: of humidum & siccum, we find that the case is agreeable to it here, that it is the proportion of the gluten, and when they come to consider this gluten they just repeat the same Doctrine of the humid and dry and so on without end, it is all we can discern, and we discern in fact that it is so, take any piece of animal matter brought into a Dry elastic state, as a piece of Catgut by soaking it in water you can diminish its elasticity and Cohesion,

and increase its bulk, and by drying it again the Elasticity and Cohesion is again increased. we have a particular illustration of this by the effects of water changing the state of flexibility &c. it occurs in the experiments of Dr. Brian Robinson of Dublin in his 2 Sect: & 35 propasit: who by a very elegant & pretty apparatus, he tried to determine the flexibility and extension of human hairs, but I must leave you to consider his apparatus and experiments he has given us the result in two tables, one where simple substances were applied, and it is only this we need to attend to. having stretched his hair, with a scale, he found that a certain weight extended it to a certain degree when it was dry, the several fluids gave it a greater Distension that is it increased the flexibility &c. & with the same weight applied. he has given these substances according to their different effects, the extension qr. dry was as 5, with suet it was 5 1/10 with oil of olives 5 1/19 till he arrives at substances extending it to 87 but that entirely destroyed the mixture it is curious to observe that cold water applied

applied is one that gives a very considerable flexibility, as 35, and all the substances as mentioned before, a variety of saline substances, & a variety of Juices of different plants, but they all fell short of the power of Cold water. This is the fact that is especially applicable to the purpose, you will observe that there are a few substances that do give a greater extension than the cold water, but there is not one of them that carries it beyond 38, that does not affect the mixture, whereas with water when hot the extension is as 80, and there is but one substance that gives an extension more than hot water, viz. Spirit of vitriol, which destroys the substance, so that water changes most considerably and effectually the Cohesion of animal substances, all the other substances are solutions of substances in water, and one might have expected that they would have acted as cold water but no such thing, these different substances prevented the water from ~~the~~ insinuating itself, and therefore the whole experiment is the proportion of water that was insinuated, so that by the different proportion

proportion of water the properties we speak of can be and are chiefly changed. Having advanced thus far that it is the proportion of water & other matter concreting with it that determines the other states. I go on to the proximate cause and to the remote causes which may affect the proportion of water with the other matter & in the

XIV Paragraph I say the proportion ——— in each. The reason is, as ——— circumstances take it in the example of the sex, I say that for the most part tho you treat a Boy and a Girl, and woman and a man the same way, give them the same aliment and exercise, I say that thro every period of life the one is distinguished by more lacility, the other by more rigidity, I don't mean to seem that a female body may not be rendered more rigid by Diet or exercise or that a male body may not be relaxed by contrary means, but there are different temperam.ts and these particularly occuring in the different sexes in spite of the different treatment continue different and if we cant find the cause of it in Diet, Air, &c.

we

we must refer it to somewhat in the origi-
-nal Stamina. to somewhat that determines
the nature of it afterwards and so with respect
to size, some persons will not be reared to
the same stature by the same way of living
that others will, there appears therefore some-
-what that determines the Stamina that pro-
-bably has an influence in the fundamental
part, in the make of the solid, what it is I
do not pretend to say, but the fact is all that
we want at present and it is a fact that will
hardly be refused and it is necessary to lay
down this position abstracted from all the
occasional causes and another such I lay
down in the 13 paragraph

XV But in every ——— concur. It is evident
that the first appearance we get of an ani-
-mal body as it is formed of a soft gelatinous
mass, by degrees acquiring the degree of con-
-sistence the different parts assume, we observe
I say that the parts are more and more formed,
till an old man, we find them in every part
more dense and firm. we impute this gt.
increase of the density to different causes it is
uncertain how many occur, perhaps the con-

densation

condensation of a cellular texture has a considerable share; but an additional concretion of the dry concreting matter has also a share, and in the same proportion a Diminution of y^e + humid takes place, This is constantly going on and giving the different states in the Infant & old man but it is not steady in persons, but goes on in different degrees as other Causes concur, and therefore we proceed to consider these more variable and occasional Causes and we say in the

XVI paragraph The Causes &c. it is universally received in Physiology that the nutritious that increases the matter of the solid is applied to what we may say is the fundamental or simple solid, take that as fibre or cellular texture, and it is not promiscuously applied. There are certain vessels, whether arteries or nerves is it not necessary to determine but these are certain vessels by which this nutritious fluid, is applied, but there are matters from without that may reach the whole, & with respect to the Interior parts even without the Course of the other matters, there are certain fluids that are so subtile that

they

they can diffuse themselves thro the inorganic porosity which may change its mixture as well as these taken in by the ordinary Chan-nels of nutrition. wt. reg. to this last, i.c.

XVII a Different state of the nutritious matter we may consider that either as it is varied only in its proportion, or by the mixture being changed and by what I call certain preternatural matters being mixed and conveyed along with the nutritious fluid by the differ: in the concoction and asimu-lation the nutrition is only varied in its propor-tion and when other matters are insinuated I call it preternatural. with regard to the nutri-tious matter only varied in its proportion, it may be different from the quantity and quality of that aliment so in brute animals we find that their nourishment and growth is in proportion to the quantity, and that again is diversified by the quality of the aliment. I we shall afterwards speak of the Diff.t aliment any matters, in wt. manner they are distinguished by their quality, by the quantity of Nutritious matter they bring along with them, thus there is not so much nourishment in a certain quantity of Turnip as in a like quantity of Beef and mutton, the one containing a greater quantity of nutritious

matter

matter than the other so that the nutritious will depend upon the quantity and quality of the aliment taken in, but a great part of it is not of the nature of the body, it is not of the nature of the animal mixt, and it is converted into this by certain powers of the body itself, by concoction and assimulation, and it is undoubted that we may thro' nourishment into the bodies of the same quantity and qualitys, and yet by a difference of these powers a difference of the nourishment will follow, so that when the body is in a diseased state Hippocrates says Corpora impuriora quo magis nutrias eo magis ledis. The applicat: of the nutritious matter depends upon various functions of the body, it is probably conveyed by certain Channels only and the common supposition is that whatever nutritious matter is blended with the other parts, it must probably be separated and undergo a derection before it is applied to the solid, and when we have considered the nutritious fluid supplied by aliment prepared, secreted and determined to the solids, there are still circumstances of the application and concretion that may have an influence

tho' they are not clearly known we shall however say enough to show that there is a foundation for the general position of Circumstances determining the concretion to be more or less firm. The nutritious fluid must be conveyed in a very fluid state; for it passes thro such passages as require that fluidity, it is in that state deposited upon the solid to which it is to adhere, but the superfluous matter is expaled, and this may have a share in giving a different state to the simple solid. But,

Lect: 10th

To some of you Gentlemen not much accustomed to Physiological reasonings, I don't doubt but our present Subject may appear difficult. it happens to every piece of knowledge belonging to a System, that taken separately it is not understood, nor is its application perceived, but as we advance further in forming our System the particulars of it will be better understood and attended to,

With regard to the animal mixt I say the only thing I distinctly know with respect to the constitution of it is that it consists in the language of Gaubius of humid and dry of

water

water and some other matter concreting with it, and the different proportions of these two parts will give all the different states of Cohesion flexi-bility, and elasticity. Therefore I proceed to en-quire into the causes of the different proportions of humid and dry, and in the first place I mention two causes that are steady and con-stant, viz! the Influence of the original Stami-na, upon this subject, I did not think it neces-sary to explain these primordical parts, these parts which we suppose to be delineated, to be formed by the Creator, and what further hap-pens in the growth is merely an accretion to these parts, or a further evolution of them. That there are such Stamina I am persuaded, for with-out entering more particularly into the con-sideration of it at present there is somewhat in the formation of animal Bodies that fixes there Character during the whole of life, so that a Child has not only the outward but the in-ward constitution of its parent, and the here-ditary Diseases are particularly in proof that somewhat takes place in the first formation that influences life ever after, and the more steady distinction of temperaments is an-

illustration

illustration and proof of the same. This therefor determines what accretion our solid parts will receive, or their particular aggregation or organisation another very steady and constant cause determining the state of the simple solids is what happens from the ordinary progress of life. From a small beginning animal bodies acquire a considerable bulk and there is no doubt that their solid parts are acquiring a fresh increase of matter, we perceive that they have received this in respect to their proportion of concreting matter. The humid is diminishing and the concreting matter is increasing in animal solids. There may be a question whether or not the rigidity of old age is owing to this addition or to the condensation of cellular texture this to be sure takes place, but the other also is evident and undoubted. aftermentioning these two causes which operate steadily I proceed to consider certain causes that are occasional and variable, but which likewise influence. These 2 more general causes, the last of them more especially, & perhaps the first.

XVI These causes may be reduced to these

two

two heads of their different manner of application. These that are applied by the ordinary Channels of Nutrition, or from without, at least from without the Channels of nutrition, as we suppose the most part of the solid parts in some measure continuous. Having referred to these two heads I next consider how the state of the nutritious fluid may be so varied as to effect the state of the solid. and we may XVII consider it in two views. Either the Nutriment in its ordinary condition, or as accompanied with other matters unusual not suited to the purpose, as preternatural matters. wt. respect to the first of these matters, its nt. manner the nutritious fluid, supposing it wt. respect to its mixt. what is common & healthy ~~[illegible]~~, yet it may be ~~[illegible]~~ applied to the growth of the solid varied, by the quantity and quality of the aliment. What aliment will afford more or less nutriment, the quality being given, according to its quantity, and the quantity being given according to its quality. That is according to the proportion of its nutritious parts. I may be thought to be here anticipating a part of the Doctrine of nutri-

tion

nutrition, but at present it is enough to show that there are such heads of particular causes and the different quality of the aliment will come to be explained afterwards but further our aliment undergoes a peculiar preparation when taken into the body, so that the nutritious fluid may be varied according to the degree of that to the concoction and assimilation it undergoes but still after this preparation of the aliment by the powers of the aconomy, there are circumstances in the application of it, there is its being applied, or not applied. in general the body acquires its increase of bulk from ingesta exceeding the excreta, there is a quantity of matter constantly passing out, and we are constantly taking more in, and were these exactly balanced. the body would never receive any addition, that is owing to the one exceeding the other, however small that may be in any given time you may consider it, it is small by the Day, by the year, or in a number of years you see what it amounts to, now if this is increased there is an abstraction, of part of the whole fluids. and among the rest of the nutritious and that will

influence

influence the present matter, and there are other
Causes that we imagine rather than pretend
to explain the nutritious Juices must be applied
to the parts which it is intended to increase
in an extremely fluid state, but that fluid ac-
-quires a dry consistent form what we call its
concretion, it would not be proper to explain the
circumstances that determine the concretion but
they may be more or less properly applied to
that purpose so you will understand how
the simple solid may be varied by the nu-
-tritious fluid. proceeding upon the suppo-
-sition that it is in its healthy or sound state
and only varying in the proportion of hu-
-mid and dry, or in being more or less proper-
-ly supplied, but there are we suppose certain
matters not easily entering into the compo-
-sition of the nutritious fluid that may be mix-
-ed with it, and conveyed to the ordinary Chan-
-nels, or there may be such matters conveyed
there as affect what is already conveyed, that
there are such is well known, they may come
from without, as from particular Conta-
-gions. as the lues venerea, which may
be insinuated into our most solid parts

or

or the matter may be generated in the body itself as in putrid Diseases so in the Scurvy such matters do arise in the body, and we may suppose that they may upon occasion mix with the Nutritious juices, and affect the state of mixture in our simple solid, but I cant dismiss this with[t] observing that it is not a common effect, and I cand raise doubts with respect to its taking place in any of the common Instances that is adduced, as that of the Syphilis or Scurvy, but this is not the place for full discussions of that kind, I would only give you it by way of Caution, not to readily admit the Supposition, or not to be ready in applying it, but we will have afterwards occasion to speak of the vis conservatrix naturæ of the animal economy, its being suited to preserve its own sound state, I therefore am ready to suppose that w[t] respect to this fundamental function the nutrition nature has provided that it should not be easily corrupted, so that it is not easy for the preternatural mates to insinuate themselves into the nutritious fluids so far with respect to the matters that must admitted by the ordinary Chan-

nels

Channels of nutrition, but I say that they may be formed without &

XVIII That I say is various but that for the most part it is only aqueous moisture in greater or lesser quantity we know that the atmosphere has a great variety of matter in it surrounding us, and there are absorbent vessels in our bodies, so that from the atmosphere and other sources a great deal of matters may be insinuated into the simple solid, and extraneous matters may also be thrown in by the mouth, and all these may be diffused very far and fully in our mass of fluids and it is possible that a portion of them may like wise insinuate itself into the nutritious juices and go along with it to be applied to the solids. But this is not what I have in view here for that whatever is the source of it, if it is received by the ordinary Channels, I would refer it to the head of other preternatural matters that go that way, but I suppose that it may be of a subtile and penetrating kind that is moving in the larger blood Vessels this may escape the inorganic pores and reach the simple solid, & our whole bodies are penetrable in this re-

spect

respect. Thus certain matters rubbed upon the
teguments of the abdomen will excite purging
and from late experiments we know that
matters injected into the Cavity of the abdomen
will reach the cavity of the intestines and
excite purging & these matters yt acting du-
bitably pass by inorganic pores thro' that po-
rosity which is in common to us & other
bodies, and such matters may likewise reach the
simple solid and affect it. I could not miss point-
-ing out such a source, but possibly they may
be very various, but what they are in parti-
-cular, I dont know, nor has any body exactly
pointed them out, except in one instance
that I shall mention presently, but we may
pass this matter very shortly. The only distinct
Instance is with regard to moisture applied
to animals, they are different in a moist
and dry climate, and we can perceive that
the moisture or dryness of the Climate affects
the mixture of the simple solid, giving it
in the one more dry and rigid, and in
the other more soft and flexible with
regard to the effect of moisture or dryness
if you consider that our bodies are exposed

to

to the atmosphere by a large surface and that the whole of the Cuticle is exposed to it whether the moisture insinuates itself much further than the Cuticle has been a question, but it is certain that the detaining the Cuticle in a constant state of moisture or dryness will more or less affect the state of the simple solid. having mentioned all the causes which can any way suppose to affect, I say supposed, for several of them are rather supposed than known to take place that we suppose I say to give a diff.t state of the simple solid I must observe that the Expression of the next

XIX Paragraph is far from being good I would wish to have it corrected in this manner. "that these several Causes may affect the proportion of water and concreting matter in the simple solid, and therefore give a different state of its properties is sufficiently obvious," I have been pointing it out all along, I add here that the same Causes may possibly also affect the state of the other concreting matter, we can in general perceive to be possible, but in

what

what manner or upon what occasion they
do so is not easily discerned. The causes hi-
-therto spoke of affect the proportion. I
say they may also affect the state of the
concreting matter in itself. I [illegible]
[illegible], I formerly said that I do not know
the several constituent parts of this con-
-creting matter, and any explanation
given of them, as that of Dr Gambius
is neither complete nor certainly true,
nay it is of no meaning or application
but we may suppose that there is a mix-
-ture, for we know no simple body in
nature, the concreting matter is certainly
a compound, and may be affected by
the application of other matters, as by
the several preternatural or extraneous
matters that may be applied to the simple
solid, these matters may particularly
have their effect by effecting the state
of mixture in the concreting matter,
but as I said just now. that we do not
know its mixture, and so we do not

know

know the effects of other bodies applied to it, I know but one instance in which this is manifest, that is with regard to the effect of Putrefaction a small quantity of putrid ferment will soon diffuse itself over the whole animal system & will affect the mixture and consequently the properties of the simple solid, here we cannot speak of the effects upon the water, the Debile rabidum of Dr Gaubius is particularly in proof of this, as we shall consider afterwards, now I have said all that we can properly say with respect to the Mode of mixture in the simple solid, and the effects of this upon the properties of it. I go on to consider

XX How far the properties of the S.S. may be also varied by the Mode of the aggregation I go on to shew that this may be the Case, and that this may be again varied or changed by the following Causes, I would have wished to have taken more time to have rendered the proofs of mixture and aggregation a little more regular and familiar to you

you, but you are to understand just now that a mixt considered in its most simple view as consisting of two or more parts, united and coherent together, we have reason to believe that any mixt thus formed of aliments is a body too minute to fall under the cognizance of our senses, and we see no bodies but such as are collective masses of such parts These are called aggregates, and these may be divided into many parts each of which preserves the entire mixture of any portion of the mass. These we call integrant parts if These are laid together more or less closely or loosely some different properties of the whole masses may result from thence, and These are the effects of the different Rules of the aggregation There may be varied by the temperature of the atmosphere to which the body is long exposed every body knows that the figure of bodies is varied by Heat & Cold, & the Bulk of Bodies is greater in summer than it is in winter, and it is by the variation of the aggregation in this respect that we measure the Degree of

Heat

heat. Thermometers are no other than matters varying in their Bulk according to the degree of heat. So we presume in animal bodies, when bodies are concreting into a certain form. The state of the temperature influences the Degree of that concretion, and the other circumstances of hardness, flexibility & elasticity depend upon that, it is evident that the bodies of men formed in warm Countries, are in their solid matters less dense than these formed in cold climates this matter however is of some nicity, as some other circumstances depend upon the warmth of the Climate that may compensate this effect, of the heat, as if the concretion depends upon powers exhaling the fluid part this may give the same Density that cold would produce. There would therefore, be room for some Dissertation here, but as I can't clearly enter into it I lay hold of the General fact and appearance, that the bodies of men are laxer in the warm, than in the cold Countries by varying the state of

aggregr

aggregation 2. by the pressure, external or internal
that is applied to the solids, our fluids are moving in
their vessels with a certain impetus or force that
serves to dilate these, and that serves to compress
their several parts this is known to every body
that has the smallest tincture of anatomy, &
while the bones are moved, and the muscles act
in moving these the parts press upon one ano-
ther the powers therefore of pressure in com-
mon life are applied to every portion of solid
matter, and hence that a different state of mix-
ture is produced is very certain, and it may vary
the matter by its acting on the aggregation but
in what manner is not quite obvious, it has been
observed that different kinds of matter can
merely by repeated hammering acquire more
density, but the experiment has been applied
only to metals, and therefore tho' some of our
Physiologists have supposed it, I don't see how
far we dare conclude that it operates in this way
upon the animal solids, that pressure has
an effect is certain, but we can suppose that
while our nutritious fluid is applied to the
solid in a very fluid state, that the drying
and concreting of it may be in part owing

to a certain degree of compresure: squeezing out the more fluid parts and giving them an opportunity to be washed and exhaled away, but this is pretty clear that the aggregate may be changed by pressure external or internal applied to the solid I have said that the motions of the body give that pressure, and as the body is more or less active or languid it will be applied and certainly it may be changed by the Degree of (3) Extension, which in every living body is given more or less to every part of the solids, I would read it thus— by the Degree of extension of the solid, which extention in every living body &c. when a living body is left without any extending powers applied it has a certain dimention which we call its natural state, and there you may divide it without the seperate parts becoming more contracted, but those bodies that are flexible if they are Stretched beyond that and if then they are divided, we perceive that the several parts admit of a contraction, till they come to the natural state, which is given more or less to

every

every part, so by cutting thro a living body, as in mak-
-ing a wound, the 2 sides of it fly from one another
and it is from this contraction that we conclude that
every part of the body is in some degree of Exten-
-sion beyond its natural state, but I shall have
occasion to explain this further by showing the
Cause of it and that it is necessary to the animal
economy, but hence the State of aggregation, the
approximation ~~of~~ or Distance is greater
or less. and therefore according to the State of the ani-
-mal economy the aggregation of the S. S. and
consequently its properties will be some what
different, and lastly the aggregation will be diff.
by the motion or rest to which the Solid has
been accustomed. what we are chiefly to con-
-sider upon this Subject is that the flexibility
and elasticity manifestly depend upon the
motion of the particles of which the body con-
-sists, upon one another, they are distended &
it is easy to see that they must be moved upon
one another thus while a rod is bended. the
convex parts has its particles moved to a
greater distance and the Concave side has
its particles brought nearer but we find at
the same time, that mobility of the parts

may

may be more or less merely from its being more or less practised for we find that bodies of considerable flexibility, if they are allowed to remain in a state of rest will not admit of that state, which by frequent and alternate extension and relaxation it can be brought to, nothing is more common than the effect of this in the animal body, and on human bodies thus from the accident of a dislocation a joint is kept immoveable for any length of time either in an extended or bended state, the parts in a great measure lose their mobility and if the knee is kept bent a week suppose or a month, you lose the power of it altogether, the tendons and ligaments are become quite rigid the properties therefore of flexibility and elasticity must be greater or less according to the rest or motion to which the solid has been accustomed but it is not in this way alone that the motion or Rest is applied, but with respect to most of the causes, according to the motion or rest, the Degree of extension as in our 3 number here will be very exactly, and according to the motion or rest the pressure which makes our second article here, will

be

be and therefore of all the other Causes of the Change of the State of aggregation this of exercise or rest is the most powerful, and the most universal, proofs, and illustrations of it will occur every day. Thus I have given a simple view of the States of the S.S. as depending upon the state of aggregation, or upon the causes that may affect this. I go on in the 3 place

XXI To speak of the properties of the solid parts as varied by the state of their organisation, I say the properties of Cohesion &c. as in number VIII are varied by the State of their organization. In the first place therefore I must consider what the nature of this organization is. To obtain some general views with regard to it, I say this every where seems to depend upon the arrangement of fibres, upon the state of Cellular texture, or upon a texture of vessels, taking in all the diff[erent] notions that our Systematics have entertained wt. regard to the Structure of the organized parts of animal bodies, they are all alluded to, taking Dr. Boerhaave idea, that the simple parts are fibres, that the membranes are formed of fibres, and vessels of the first order formed

of

of these and from these membranes and vessels of the 2d order and so on. Neither do I enter into the supposition of Dr. Haller that there is no such fibres. I admit both suppositions and go on to consider how the state of our more complex & organic parts may be affected by the states of the simple solid, but it will be enough I say to mention the causes of the differences which occur in these fundamental parts. I should have said the causes of the differences that occur in these fundamental textures or organizations I go on therefore to consider them a little. & supposing that there is a portion of our animal substance that is fibrous, I consider how all these may be affected, it is a curious and difficult question. a late writer in France has taken it into his head to maintain, that the size is alike in every animal, and the same in every period of life. he founds it upon microscopical observations, but not to say how fallacious these are, we may neglect his system altogether because it is not applicable, but it is probable I say that with regard to fibres, one of which is the 27,000th part of an Inch, microscopical

observations

observations may be very readily fallacious. &
it is more probable that they may differ in
their size from the causes mentioned from
XIV —— XXI but so far as I can perceive it
can be affected by these causes alone, and there-
-fore the consideration of fibres, as the only
difference of their organisation is their increased
size they do not I say require to be consi-
-dered further, as their difference depend upon
the causes already explained. when mention-
-ing this subject I could not help throwing in
what applies here, but how far the organiza-
-tion of any part depends upon an arrange-
-ment of fibres we cannot distinctly perceive
that there are fibres in a great part of the animal
solids I think I will be able to demonstrate, but
that these are interwoven to form a membrane
as Dr. Boerhaave supposes, I do not perceive
nay all the later views of our anatomists lead
to the contrary opinion, yet the primordial
structure every where receives a cellular
texture interposed. between which the indi-
-vidual fibres lay, and it is not necessary for
us to consider what would be the effect of
such fibres, because the greater proportion

is

is cellular texture and therefore it will be ex-plained by what we are going to say with re-spect to the Cellular texture, we therefore avoid the dispute, because however determined it will not affect the consideration it will be the Cellular texture in the different states of these fibres, that will vary the organized solid.

Lect. 11th.—

I began yesterday Gentlemen to consider by what causes the state of aggregation of the S. S. may be varied, and they are reduced to these 4 heads. 1st. The Temperature of the atmos-phere. 2dly Pressure, 3dly Extension, & lastly Motion or rest, with regard to the 3 Cause that of Exten-sion I explained, I pointed out to you, that evidently every part of our solid was in an extended state, beyond its natural state I may say and yt. that again affected its contractility, but I did not explain this fully, so as to let you understand the effects of this Cause. It is necessary to observe that an elastic Cord, fix-ing it at one extremity and appending weights to stretch it, by the applying of a given weight, as of a pound, the whole length is extended to a certain degree, if you apply

to

to the same an additional pound, you will not find that the Cord is extended to twice the length that it was before, and so if you continue adding weights not sufficient to break it altogether you will not find that it extends it in the same proportion, but perhaps as one and a half ∪ 1½. This is an experiment that is familiar to every body that has considered this subject, and from hence it appears that the flexibility diminishes with the Degree of extension but at the same time that the elasticity is considerably increased and that indeed in proportion to the extension, thus when the Cord is extended by a weight of one pound it is then by taking off the weight immediately contracted but not with the same force as when it is extended by 2 ℔, nor then as when by 3 as the flexibility is diminished and the rezidity increased in proportion to the extension, and also the Elasticity, but we must suppose that the Cohesion is constantly growing less, the particles being set at a greater distance. Thus if a Cord requires 4 ℔ to break it, and 3 be applied, a less weight than 4 will break it altogether, so that there may be the Distructio ruptura proxima of Dr Barth. you will have hereafter some application of this. This Cause being explained I proceed to

consider

consider

XXI. The causes that may affect the organization with regard to these, taking all or any of the systems, you will find that the organization however complicated it may seem, yet that foundamentally it depends upon an arrangement of Fibres, the Male of Cellular texture, or upon a texture of vessels therefore if I am to consider the several Causes affecting organization it will be sufficient to consider these causes affecting these fundamental textures. With regard to the fibres, what ever share they may have in the texture of the more compound parts, we do not think it necessary to determine, certain parts are allowed to be fibrous, and so by their state the whole may be affected. so with regard to organization a fibre can be only different from another as it is longer or shorter, thicker or slenderer & with respect to these they must entirely depend upon the several Causes already explained, with regard to the different states of mixture and aggregation, but I say that it is necessary for us to consider or very nicely to enter into the several late Disputes, for tho' the existence of the fibrous parts is demonstrated, it is never by itself, it has a cellular texture between every single

fibre

fibre. so in any membrane its laxity or rigidity will depend upon the Male of this cellular texture, with respect to the universality of cellular texture I must point it out to you as Dr. Haller mentions it in the 12 paragraph, and you may seek for the proofs of it in his larger work, the conclusion is "ubique nempe, ut nullo excepto mihi nota sit." there is not a part of the soft solids in which you dont perceive a cellular texture, and that making up the much greater part of the whole to that purpose you will find several strokes in his first Chapter, therefore I have said in the XXIII paragraph, that the Male of Cellular texture is the most important circumstance in all organized parts, that I would have you consider a little fully, as Dr. Haller has given it in his 22d paragraph, summam Dignitatem —— componitur. Dr. Haller is not quite clear that every part is thus composed, as he insinuates elsewhere there will be a nicity in other cases to determine this more particularly, but the gen. position that the greater part is formed of cellular texture may be admitted. so the Male of the S. S. in the organised parts must depend upon the Male of the Cellular texture, and this

may

may be varied by different causes, as I premised upon the subject of mixture so here the state of it, from this view being so much diversified in different parts of the body and thence giving the figures and connexions of the different parts may be considered differently and the different states of it is also in the first place to be referred to the state of the original stamina to somewhat given it in its first formation but I thought it was not necessary to insert that in the text book, but from various causes in some measure variable and occasional we say the texture may be denser and thereby firmer, as it has been more pressed by the actions of life or external force by which means especially it is changed in the progress of life, as I have before hinted, the progress of life I may say in every condition goes on in increasing the solid matter, and particularly in increasing the density of the cellular texture, we have many illustrations of this in considering different parts of the body in different periods of life one example of this is what Dr. Winbringham junior has found with respect to the blood vessels, he has taken a portion of artery and vein in a young animal, and he finds that the veins are of a

considerably

considerably greater density with respect to their
Bulk than the arteries are that correspond with
them so of the vena Cava and aorta or emulgent
artery and vein, or the Iliac artery and vein
in young animals the density and strength
of the vein is greater but in full grown or old
animals the proportion is changed, the arteries
are increased in density and force, and the
density and force of the veins is diminished
or at least the veins have not increased in these
in the same proportion, for now the density
of the artery exceeds, so that we see certain parts
acquiring greater density as life increases, and
that in one portion more than another and
it is as I have said here according to the parts
being prefsed by the actions of life so in the
vena Cava and aorta, the blood in the vena
Cava moves slowly, and into larger trunks
and the prefsure that it receives is not to be
compared with what the Aorta sustains,
which is the impetus of the blood thrown
out by the heart, now if the arteries had been
equally dense as afterwards, it would have
soon brought on that rezidity which obtains
in old age, and therefore it was necessary to

have

have them more lax that they might subsist in a due degree of Density thro the duration of human life, & in fact it sometimes goes so far as to produce an ossification in old people, which gives the rigidity, we speak of, but they are thus prepared for a greater pressure by the laxity of the cellular texture, and as you proceed towards the extremities that density is increasing gradually, as you proceed I say from the heart, and that because they were not exposed to such pressure as these parts nearer the heart are. In considering the causes by which the cell: Text: may be varied I mention 2. the 1st is that its density may be increased, the 2d, is that the Cellular text may be increased in Bulk, and made firmer by a new growth and force of membranes, as in proportion to the thickness of the whole together, you may increase their force, but here I am at a loss to go further to account for the growth and formation of cellular texture is still a difficult matter, and so we cannot explain all the causes that may produce it, but there is such a power and that may be on certain occasions increased or diminished, there is a certain proportion of the Cell: texture, & the growth of the several parts must depend upon this in some persons however one part

takes

takes a greater growth than the usual proportion and that must be owing to new growth, one instance of this new growth frequently happens in membranes that are slowly and gradually stretched out, by various causes either of increased impetus of the fluids, or from a weakness incidentally arising in that part, hence a dilatation of such membranes takes place among the other instances by which nature has provided the economy with the power of redressing its own errors here is one if the membrane is slowly and gradually dilated the rupture is prevented by the parts becoming more dense, the fact is well known to every body that has examined morbid bodies, but it is necessary to take notice of the way it is expressed here I dont say every stretching, but a slow and gradual stretching out for if the parts are weak, or the dilatation sudden, the membranes are rendered thinner, but on the contrary condition they become thicker; so that a considerable preternatural dilatation will subsist for a great length of time, next to these two causes more pressure, or an increasing of growth of cellular texture, as causes of greater strength & rigidity,

J

I would add

Causes that weaken this texture, and the diminution of the quantity will weaken it, and the quantity will be deminished if any acrid matters can be applied that will erode a portion of it, so I say (3) the same texture may become weaker by some part of it being eroded by acrid matters generated in the body or externally applied, we have seen for example in the case of ulcerations, where the vessels were still surrounding the parts, that the acrimonous matter has eroded a part of the cellular texture so that an eruption and effusion from the blood vessels has been produced. here is one way by which the Cellular texture may be deminished by Erosion, and I say fourthly it is analogous to this, that when any part is sustained by any layers of Cellular texture, or membranes, such support is weakened by one or more of these layers being cut thro' every where almost in the human body, we can discern the Coats of the human vessels consisting of layers of cellular texture of more or less density, and the functions of the vessels as containing fluids depend upon the whole of these taken together I should have observed

That

that the most simple membranes of the body when examined in a certain manner are found to be divided into a great number of layers as in the Diphra anatomica, where they take advantage of a singular Statical power, as you will find is described in several of our anatomical writings it applies in fact in several diseases. The arteries consist of Coats and these of layers of cellular texture, and a Lancet, e.g. cutting thro a part of these an aneurism has been produced and Dr. Haller did so by way of experiments and tho' it has been doubted whether the true or Spurious aneurism has been occasioned by this, yet it is now agreed that by merely a puncture, a true aneurism may be produced, and perhaps at last a Spurious, first by dilatation &c. I think it necessary to observe here that it is analogous to this consideration of parts being supported by layers, that a like weakness is produced when any external compression which for some time, had been applied, is taken away. It is a matter of daily experience that if a ligature has been applied for some length of time if you take that suddenly away, the part loses its firmness & strength, and nothing is more obvious than

that

that we can obviate that by compresure, as in anasarcous and edematous Limbs. in the case of varix, &c. where we can assist the external parts by compresure, but the parts afterwards cannot be sustained if such usual support is taken away when it has now become as it were a part of the sustaining membrane, but how habit induces the necessity of such foreign and internal pressure is not easily explained. but considering how much the functions of the S.S. depend upon the degree of tension in which it is kept, we can observe that every part in this way may acquire a certain habit of tension that is necessary to its action, and therefore the ablatio sustentaculi is one of the ways of weakening the cellular texture the first and second causes mentioned therefore act by increasing the force of the cellular texture and the 3d & 4th by weakening it, the 5th Cause that we are next to mention may either have the one or other effect. The Cellular texture every where over the body is constantly filled either with a matter in the form of liquid, or with a vapor, the later certainly frequently takes place, and it is this that best explains the elasticity in every part of our body, the parts are soft flexible, and yielding on being

pressed

prefsed upon, but upon removing the prefsure they become of the same bulk and figures, this is owing to, nay this is an argument that they are filled with a fluid in the form of vapor, but we need not be confined to that supposition, for when they are filled with fluids, the Cellular texture communicating, suppose we prefs upon one part the fluid is pushed into the adjoining part, and upon removing the prefsure, this part contracting restores the prefsed part to its former bulk, so that we can readily understand the Elasticity that appears in every part of our bodies but this may be varied to a considerable degree by a difference of the matter, that may fill the cellular text: there are frequent instances of effusions into the cellular texture of matter that concretes into a firm and rigid hardnefs, frequently it is a bonny matter or perhaps it is more of a stony or earthy matter, and then we call it a petrifaction, and both are causes of unusual rigidity in certain parts on the other hand instead of being filled with a vapor, that may be accumulated in such a quantity as to take on a liquid form and occasion what is a very common Disease the edema, anasarca, where the cellular texture is filled with a watery or what is called

a.

a serous fluid, and when that is increased so as to overstretch the parts this destroys their elasticity and prevents the free efflux of the fluids from one part to another and hence the parts will be soft & flaccid, so that when pressure is made upon any part, the effects of it, the pit, may remain for a long time before the fluid return, and that owing to the flaccidity of the parts. Here speaking of the cel: text as filled with different matters, I have been hitherto speaking of the simple homogeneous fluids, and have abstracted from the heterogeneous aggregation the bones with regard to their formation there are disputes among the anatomists, but it is agreed to by Dr. Haller, who has opposed the Doctrine of Du Hamel with respect to the formation of the Bones, he agrees that they are formed of a cellular texture filled with a matter that is of a bony hardness, in the 16 paragraph where he is giving his own Idea of their formation he says, ea bela fibris &c. the bones are originally soft and formed as every other membranous part, and they acquire a hardness of a certain nature, filling the net work of the Cell: text: the state of the bones is accounted for in the same manner as I accounted for the rigidity of the other parts either by ossification or petrifaction. These

may

may vary in their state of Cohesion and flexibility, which. I shall consider afterwards but I cannot separate the state of the bones becoming softer, and I say, The bones formed in the first manner may again become soft by the hardened matters being dissolved and reabsorbed. If we had been to judge of this matter from the consideration of its Causes we Dr. have had a great deal of Difficulty in admitting the fact, but lately i. e. within these 20 years several cases have occurred of the whole bones of the body becoming soft and suffering various distortions, and it appears plainly that this must be by the matters being taken away that give them their hardness and consistness; and that by a matter that softens them again and we know that there is a Course for every fluid from one part to another, but with respect to the sort of menstruum how it can arise and how it operates in eroding the bonny matter are problems that are not easily solved, and are by us, to be considered in another place.

In the 6th place I say, when the mobility

——— yr. before, if you will be pleased to consider the 22d paragraph of Dr. Hallers prima lineæ that I read before, you will observe that the connexion of the several larger viscera depends upon the connexion of the cel: texture and is in proportion to the extent and nature of the Cellr. text:

and from that consideration you will readily understand what I am delivering here, so that if there are two parts that are connected by a large and a long portion of cel. text. and if you will either by Erosion or with the knife take away an intermediate part the parts will unite again, and if they are again joined together they will be more closely connected, and the cel. text. in that part will indeed be stronger. It is in some measure upon this that the radical Cure of the hydrocele proceeds there was dilatn and in some measure an increase of the Cel. tex. surrounding the Spirmatic Cord produced perh: by a Collection of water, and here we not only evacuate the water, but we destroy a considerable portion of the Cell. text. and thereby make the other parts more tight than they were before it was proposed to cure ruptures in the same way, and tho' this has failed, it applies equally in illustration of what I say, and so will be of what I have next to say. (7) Parts ——— each other, nothing is more frequent in the dissection of bodies that have been subject to certain diseases, than to find the several viscera which are naturally disjoined and readily moveable, closely glued and cement-

ed

cemented together Thus the Lungs are moveible on the interior surface of the pleura when a person is in a perfectly sound condition, but we frequently find them and that without inferring any considerable Disease firmly joined to the interior surface of the pleura, and in this case we find the union formed by an interposed cellular texture whether it is of the same nature as that formed in other parts I am uncertain, but it has the same appearance, and in certain circumstances a cellular texture may be formed upon the surface, on polished surfaces this does not readily happen but when the parts are closely applied for some length of time what is the peculiar effect of Inflamation which is the most common foundation of this Coalitus is not easy to say, but it evidently gives occasion to the close application and adhesion of the parts. This is one of the Causes by which the State of the Cellular texture may be different and may change the State of mobility in different parts

With regard to the Head of fundamental texture, so far as I can see, it is all one whether we admit the Boerhavian Doctrine of a texture of vessels forming a membrane.

or

or if we take the Idea of Dr Haller, that it is not the vessels that form the membrane, but that it is the Cel. text. and that the vessels are only laid in that text. interstuntur, but in many parts of the body these same vessels make a considerable portion of the membrane, and there they may vary the firmness and laxity of the whole according to the following several conditions 1. They may be more or less full of fluids. when I explained the effects of extension in giving rigidity, I might have said that the distension dependsupon the fluids filling the parts, so the parts will be more or less firm as these vessels are more or less full of fluids, and that this fulness varies considerably is sufficiently known and 2dly the same membrane may be rendered firm from the vessels being changed into a solid mass and there is a considerable portion of our fluids that if allowed to remain at rest concretes into a firm substance, such is the formation of polipi and these thick layers that form sometimes both in true and spurious aneurisms, when a vessel in such a case is cut thro' we find that the Cut thro' orifices are plugd up by a portion of fluid

concreting

concreting with the vessels very firmly, and there are several instances where the coagulable parts of our fluids concretes with our vessels, and this is one way whereby they may be formed into a solid. You will bring Gaub: along with you tomorrow &c.

Lect. 12th

In considering the affections of the organized solids, I observe that the organiz.n every where depn upon certain fundamental textures i.e. is either depends upon an arrangemt of fibres, the state of cell: texture, or upon a texture of vessels, with regard to the first an arrangemt of fibres I have said that as organized, we can only consider them with respect to their size. With respect to the Cell: texture I have considered all the varieties of it, as more dense or increased in bulk or again as rendered weaker and that either from its being eroded, or by some of the layers being cut thro' also as it is varied by the state of the matter in its cells: by a portion of the membrane being taken away, and its being joined by a shorter cell.r text: and lastly it may be varied and a debility of it induced by parts naturally discrete being joined together and that perhaps only in consequence of their being applied closely to one another for some

time

time and

I was coming to consider how the state of the solid may be affected as consisting of a texture of vessels and this may be again referred to two heads, as remaining vessels, or as becoming a solid and the Causes of this I conceive to be three, in the first place they may be changed into a solid by the fluid stagnating and concreting into a solid. 2dly they may be changed into a solid if the fluids that should pass thro' them are intercepted and the Cavity is filled w.t a cellular text there is some difficulty in this, but we have many instances in the ordinary progress of life of such cases, as the umbilical vessels and others that are found seemingly filled with a new matter, when in consequence of an obstruct. that prevents the liquid to run on. the concretion may be effected either by the hollow vessels being plugged up and the Cavity filled, as the pith does the trunk of a tree or if the sides are pressed by any external power, they may coal.te together and form one solid mass. and I believe that both really take place and upon the whole it will be easy to understand, how vessels formerly hollow tubes or

a

at least filled with a moveable fluid may acquire
a greater rigidity and be turned into a solid
so much with regard to the animal solid, &
having finished this, so far I have delivered
the Physiology but at the same time
XXV Paragr. I say that the Pathology of the
simple solids cannot be properly separated from
their Physiology, and therefore, many different
states of these solids, tho such as are always
morbid, are mentioned above. It is sufficiently
obvious that with respect to the different states
there is certainly a considerable latitude between
the bounds of health and the morbid state, which
is only a little more, and we will not understand
the bounds unless we consider them as going
into a Disease several have been of opinion
that the Physy & Pathy of the whole should
be constantly conjoined together, and some sys-
tems have delivered it in that way, and it is evid.t
that upon many occasions it is the best but
it is not easily executed, it would break our views
both of Physy and Pathy, it would make us
lose the connexion of parts in Physy and
still more would it break our view of Diseases
for diseases are connected with one another

more

more by a common affection than by the part
parts they affect, so the peripn.ᵃ and gastritis, if
× we were to consider each of as in the Phys.ᵍ we
would have to premise the general Doctrine of
inflamation much more than the parts they
affect, for there is somewhat that connects them
together in an order different from the organiz.ⁿ
of the part affected, and that is the reason that I
do not attempt them together, but I shall in some
measure do it in the Pathol.ᵍ wherein the account
of the Symptᵐˢ we will have recourse to the Phys.ᵍ
and this will allow me to deliver the Phys.ᵍ
more fully than I should have time to do now
but the Pathology of this Subject is every where
an application of what I have been saying. I
have therefore given you a short view of the
whole of the Pathology of it, and this I have
thrown into more distinct Tables than I had
done before, and as you will have occasion to
consult Dr. Gaubius I have referred to the names
he gives, and I have comprehended just so ma-
ny diseases as he does, only that I think it ne-
cessary to give them in a somewhat different
order, he considers the affections of the soft
and hard parts according to the nature of

the

of the affections I think it is better to consider the Diseases of the naturally soft, and of the naturally hard parts and we will find some advantage from throwing some of the diseases of the bones into one view so the morbid affections of the soft parts are in general debility or rigidity, and so Dr. Gaubius views them under the titles of Debile et rigidum, under the title of Debile we comprehend our four first numbers and under the rigidum the 5 & 6th, I am uncertain if we should put the four first under the title of debile it is doubtful whether a part from more strength of Cohesion is more debile or rigid I have considered it as more or less moveable, as the parts are more or less moveable upon one another, the one case will give too great mobility, and the other to gt. rigidity, the first must again be subdivided as it is with respect to the force of Cohesion, or as it admits of more or less of motion. the parts upon one another Dr. Gaub. views the matter in this light in his 159th paragraph. Debile ——
— Dissolvitur either where retaining its cohesion it admits a greater flacidity, whether neurosii impar or not that is parenthetical, or altogether

Ther

altogether broken, as he has treated the matter in this way he thinks proper to begin with the Cases where the flexibility is increased, salva cohæsione but if we put the four first under the title of debile, I must begin with the other two and that there is a facility without affecting the Debility I am well persuaded the debility more strictly viewed, as more easily losing its cohesion, is either where the flexibility is preserved, or where it is fragile or brittle, the first is comprehended in the 161 paragraph and first No., the Debile tenerum gracile, take his definition of it. Tenerum gracile ——— rumpuntur. here is the only case where he uses the term fibre, every where else he uses the term of solid, but he thought the tenerum gracile could only be applied to the parts in a fibrous state but admitting even the notion of Dr. Haller that even a fibre may be formed of cellular texture. I can suppose it to be in the state of the tenerum gracile the lamina of the cellular texture may be so as well as if arranged in the state of fibre, but he finds that it does not comprehend all the instances of debile flaccidum, and so he gives a second species under the title

of

of tabidum which is merely relative to the differt causes, he here comprehends all the other causes of a weaker force of Cohesion from changes of mixtume where either the part is fibra macerata, corruptis humeis, or aqueis, oleosis, mucilagino -sis, dui sola, acribusve erosa, I shall consider these Cases a little more fully presently, but the de- -bile tenerum & debile tabidum need only be taken notice of here the next he has given is the 3 spe- -cies, the Debile fissile, fragility is a term readily understood, it does not yield to any extension, but with a moderate force loses its cohesion with respect to its causes I shall speak imme- -diately. There is another species that may be called debile, where the cohesion continues but the flexibility is increased, and this is termed Laxity, the terms Laxum and debile have been promiscuously used, but it is proper to abstract here, and Gaub: has done so, 161. 1 Laxum, ——— patiuntur, here only I differ a little from Gaub: I do not emplay the term flac- -cid merely for this Laxity that may be of these 2 kinds, with or without Elasticity & he means to oppose it to the iners: which follows. There are two Cases of Laxity I say,

one

one where the elasticity is preserved, and the other where it is not, and this last is what Dr. Gaub: means by his debile iners, and I think the English language comprehends this distinction well enough under the term flaccidity, and this may be comprehended under the title debile of Gaub. or too great mobility of the parts. The fifth and last are certainly cases opposit to these, where less mobility and more strength occurs this is comprehended under the title of rigidity, and I say it is of two kinds, as it only diminishes flexibility, giving the rigidum tenax of Gaub: or as it destroys it altogether, and gives the rigidum durum of Gaub: of which in the 165 paragr: you may take his definition more fully. These are the Diseases of the naturally soft parts

These of the natural hard parts are of 2 species. viz.t a flexibility that is unnatural to them, and a fragility that is also so, with regard to the unnatural flexibility Dr. G. gives a term that is readily applicable to the soft, as well as to the hard parts in his 160 paragr: and 3.d species Flexile &c. that is entirely as applicable to the soft parts as to the

hard

hard, with regard to the fragility of the naturally
hard parts the fragile Spongiosum and fr: vitreum
of Gl. The fragile Spongiosum that I put first
he gives as the fourth Species of the 161 p: here
he calls it simply fragile, it is easily understood
in this way, that as I told you the bones are
originally membranous parts, they are merely
a cell: text: but by a matter that is fit to con-
-crete into a hard mass and being poured out
into these cells it acquires the bonny hardness,
but they are united by the glutinous matter
of the membrane into which they are laid,
and the flexibility is preserved by the oily
matter exsuding thro' the bonny matter, so
that pinguii and glutine emunda, the
functions of the soft parts are destroyed,
or that oil which should preserve that lubri-
-city and softness, which the bones naturally
possess, not being supplied, they will become
brittle. The other which he calls the fragile
vitreum arises in consequ of a certain state
of condensat: not simply from a condensation,
but from a certain state of it, with regard
to it he thus explains himself in the 3
No. of the 165 p: fragile, vitreum in ossibus

a

a fragile Spongiosa diversum &c. Here it is only where he introduces the term of fr: Spong: it is a little difficult to give a proper Idea of this fragile vitreum it takes place in metals e. g. take a piece of malleable Iron and allow it to remain in the fire till it gradually cools, it is still in the same condition that it was before But if when it is red hot you plunge it into cold water, or into what is called by the workmen tempers you acquire a harder and more brittle metal, and you convert it into a sort of Steel. The difference of more or less fragility depe: upon the Circumstance of Condensation, but whether it is greater or less is not easy to say, but it is supposed to be less, and we know that the same occurs in glass, thus take a piece of glass and cast it suddenly in the air you get an extremely brittle glass and it is in this way that we get these curious pieces of glass called the Bologni bottles as the workmen carry it to what they call the nealing of the glass, where it is cooled by slow degrees but whether any such thing is applicable to our bones is very uncertain, but Dr. G: hints at one instance, Docent ossa hyemi fragiliora, it is true that not only this application of cold does really occur, but cold applied at all times diminishes the flexibi-

lity

flexibility and increases the fragility of the bones
every body therefore exposed to the cold is more
brittle in winter than in summer. and Dr. G.
supposes that the bones are in like manner more
brittle in winter than in summer, but I cannot
conceive it to be possible, for the external cold can-
-not affect the temperature of the bones: except
it affect the temperature of the surrounding
parts and with respect to fractures more readily
occurring in winter than in summer, it is very
true, but that it is from any fragility of the bones
I cant allow, it ocurrs when every thing surround
-ing us is hard frozen, and then the least false step
when nothing will yield, tho it would not occasion
such a thing on soft ground, may readily do it
upon ice or other hard ground and I perceive
no proof of the bones being more brittle: and
therefore tho I set it down here, as to be compre
-hended under the brittle, I do not know that
it ever takes place. I have thus kept to the
same morbid affections that G. has done, and I say
with regard to all of them that the remot and
prox causes may be understood from what is
delivered above, so it will be a proper exercise
for you to refer the causes I have mentioned to

the

the several heads here. as they produce their Dis-
-eases and I leave this I say as an exercise to your
selves. only I will give you something that may
lead you and guide you in it, I will now try
therefore, keeping in view these Diseases to refer
the several Causes, mentioned before, to them
more particularly and I say the Diseases may
consist in debility or in to great mobility of
the parts. giving the 4 first divisions of the Dis-
-eases of the soft parts, or in too little mobility, giv-
-ing the two cases of rigidity, which make the
5th & 6th Divisions

With respect to the first consid.n as respect-
-ing the Cohesion and continuity or as it relates
to the mobility of the parts upon one another
the cohesion being still preserved or subsisting,
with respect to the debility strictly so called, —
Where the cohesion is too weak, it is of two kinds
the Debility with flexibility, or with frazility,
and first the Debility with flexibility may be
owing to several Causes, and first to an over pro-
-portion of water in the mixture, and that may
arise again from various Causes. 1. from the state
of the original Stamina determining the
part to take on more or less of solid matter,

or

or in proportion to take in more of water or, independent of the original Mamina. it may be varied by the State of Aliment, either from the want of it, or from its conveying less nutritious matter, or these being given it may be more or less according to the State of concoction or assimulation, again the nutritious matter being prepared, it may be varied, as that is more or less applied. and as there is a different proportion between the ingesta and excreta, as any considerable evacuation may abstract the nutritious fluid from being applied, or these given there may be circumstances in the application that may vary the proportion of the water and concreting matter, I have hinted that these are not very clearly perceived, but we have reason to believe that is dep: upon exercise and pressure forming the more solid concretions, these are so many different Circumstances that may affect the proportion of water in the S. S. and thereby give debility with pleasibility or, it may depend upon a weaker cohesion in the parts of the concreting matter and that may depend upon a vitiated nourishment upon certain preternatural matters carried along

by

by the ordinary Channels of the nutritious
fluid or the same may be affected by other
matters variously introduced from without,
take notice of q.t I was reading from Dr. G.
with respect to the debile rabidum, in which
he supposes the mixture may be affected by
the introduction of different matters. and even
merely by the external application, aut aqueis,
oleosis, mucilaginosis, diu fota. we can conceive
that watery parts may abound into q.t a
quantity in our bodies. and may more or less
insinuate themselves into the solid parts or
as it is effused it may be a sort of fotus by ex-
-ternal application relaxing the solids I have
not taken notice of the Oleosa it is from a doubt
upon what footing the effects of oily matters
are to be explained, but it is the universal opi-
-nion of Physicians that oily matters do more
or less soften and relax the parts to which
they are applied, I however, tho' the fact is
seemingly clear, am still uncertain with reg.
to the manner of the application. I see that
nature has provided an oil between parts
that are to be moved, to give a laxity to them
and upon the dry and unequal surface of

the

the Cuticle oily matters by filling up these
may give a smoothness and laxity to the
whole. but here is a difficulty from Dr. Bri-
an Robinsons experiments when he finds
water so powerful. he finds that all the oily
matters have very little power when dry
the human hair was as 5. with Cold water
as 35 and with warm water as 80, but the appli-
-cation of oil gave little above. the dry. so that it
is doubtful if it is easily insinuated into the
solid parts. Let us connect now our parts, the
Debility with Flaccidity may be owing to the
over proportion of the water, or with respect to
the Cohesion that being weaker. or it may be
owing to the aggregation, to the fibres being
overstretched. or in the 4 place it may proceed
from the state of the cellulosa: from this being
stretched out too much. or by parts of it being
taken away by Erosion, or by some of the layers
being: ens Thro: and I join here as a Cause of
Debility with flexibility the taking away
any external support and lastly these proper-
-ties may be affected by an emptiness of the
blood vessels or other vessels containing fluids
These are the several Causes of Debility wt

flexibility

flexibility the taking away any external support and lastly these properties may be affected by an emptiness of the blood vessels or other vessels containing fluids. These are the several Causes of debility with flexibility

The 2d Case is debility with fragility the Causes of that may be, too great an abstraction of humidity, for it is the humidity that gives the Cohesion to the whole, and it is these parts that are exposed to drying air that Chop and break, the same is in some measure produced by cold, thus with respect to the Cuticle the fragility that is brought on other bodies is frequently induced upon the Cuticle, and so in the winter season chops and cracks in the lips are most ready to occur, and Fragility may be induced by certain changes in the concreting matter, I put it so gen.ly because I dont know the composition, it may be salt, oil, Earth &c. but tho I dont know the Composition whatever it is there may be such Changes in it as to give fragility it is necessary here to state these heads, tho' hereafter we are to enquire into the Circumstances of them, and these are the morbid affections that are strictly attended with Debility.

we

we proceed to the other species of Debility and that with elasticity which we call laxity, & it will indeed most commonly be joined with the debility and flexibility, for it may be produced by all the causes which produce debility with flexibility all of them are, rupture applicable except one i.e. the Distractio viva. which deminishes flexibility and here there is another cause to be added that does not give debility and that is a want of tension. I have said that both our Simple Solid and vital solid in order to their action must be extended beyond their natural State, if they fall short of that it is a laxity that is produced neceparily

The 2 morbid affection is laxity with loss of elasticity, or what I call flaccidity this may arise from these two causes 1st. from an over proportion of water and 2dly from long rest in an extended State, to understand this I say that the flixibility of our solids may be increased or diminished by more or less of exercise, in whatever State our solids remain at rest they lose their mobility, if they remain long contracted they acquire a degree of rezidity and if extended they lose their Elasticity. a 3d cause has been mentioned, the Stretching the parts ultra tonum, I

have

have diffic.ty in explaining it, with regard to many kinds of Cord we can see the thing take place, but this constantly consists of a great number of fibres and a part of these being destroyed, it will destroy the flexibility and elasticity of the whole ——— I see I have not been able to finish my Subject, neither can I finish it tomorrow, as I have got a pressing call to the Country, we will therefore refer it till monday. ———

Lect. 13.th ———

With regard to the importance Gentlemen of the Doctrine of the Solids there are different opinions. I believe the most are of opinion that it is not of the same importance that it appears to be of in the System of Dr. Boerhaave, many circumstances of the oeconomy that were imputed to the State of the simple solid, are now known to depend upon the State of the moving fibre, & in the same System many Phinomina were imputed to a change of the State of the simple solid, whereas the State of that Solid is not so readily changeable nor is it so frequently changed as has been imagined But it is certain that this Doctrine is of considerable importance and we cannot be able to judge of that or of

its

its application without studying it very fully and exactly. I find it therefore necessary to take different views of it, as I have done in the first place of the causes of the several changes induced upon it, and their principal effects, and am now considering the different effects and endeavouring to trace these to their different causes I have said that the Physiology and Pathology cannot be well separated here and I therefore proposed to give you a view of the Path.y of the S.S. I entered upon it in the last lecture, but there were several nice distinctions that occurred & I proposed that you should be exercised in forming a table with reg.d to them but as that might have been difficult I resolved at once to supply it, and I hope it was for your benefit that I missed friday's Lecture, as I have prepared this table since, tho perhaps it is not so accurate as could be wished. This is the first instance that I have given of a tabular view / see the table page / I shall upon several other occasions repeat it, and I would have you to attend to my management of it, and to the manner of reading it.

You will please to observe, that my first

Divisions

Divisions are always marked according to the ro-
-man notation by the Roman Capitals, so here
the first devision is the Division of the S.S. into
those of the naturally soft parts, and next near
the foot of the following Page you will find the De-
-vision of the Diseases of the naturally hard parts,
the next subdivisions I make are always marked
by the arabic Cyphers, so the first devision of
the naturally soft parts is, mobility of the parts
too great if you seek for the second arabic Cypher,
you will find mobility of the parts too little,
or as it is expressed in one word, Rigidity. In
this way you find the members are frequently op-
-posed to one another. My 3 divn is always
marked by the Capital letters of the roman
letters, so the capital A, with respect to the force
of Cohesion, you find the member opposed to
it, the Capital B, these are two heads that are
always to be taken together, A with respect to
the force of Cohesion, and B with respect to flex-
-ibility, cohesion remaining, you will easily
understand the progress of the other subdivisions
the 4th subdivision is always made by the
small Roman letters a, b, &c. the subdivisions
after that are made by the small greek letters

a, B, γ, & H. you will not be confounded when I take notice that these are necessarily repeated in different places e. g. not only under the Capital a, but also under the capital b. The small letters are repeated if you accustom yourselves to these tables, you will find it an useful exercise, thus whenever I find a Subject that consists of a great enumeration of particulars, I never am certain of comprehending it, till I thro' it into a table, in order to comprehend the subject and arrange the parts more properly, and in this way I have the clear arrangement that presents itself from such a tabular view.

I went thro' this subject mostly last meet-ing, but I go thro it again for the sake of some remarks that I have to make. The Diseases are divided into those of the naturally soft parts, & into those of the naturally hard parts, which Dr. G. has considered together, and has divided the whole into the 2 heads of debility and rigidity. & I have (where I could) referred, in the Italic Characters to the terms of Gaub. With respect to the mobility of the parts being too great, I regret my making use of terms that have not been commonly received, but where I

can

can find concise and accurate expressions, I am ready to employ them but by this term I understand the mobility of the particles of the Solids upon one another, their being set at greater or lesser distances, that may be either too great or too little I might have comprehended the whole under the title of Debility but he does himself distinguish between debility with respect to the force of cohesion and flexibility with respect to the force of Cohesion. The mobility of the parts gives either mobility with flexibility. (perhaps it should be debility with flexibility) or Debility with fragility with regard to the first, Debility with fleaty you will find by 2 Species that he refers to that head, the Debile tenerum gracile, and the Debile rebidum. The next table is the enumeration of the Causes of such Debility, I have a view in arranging these to the mixture, organization, or aggregation, I say with regard to the mixture, Debility with flexibility may arise from an over proportion of water from weak cohesion of the concreting matter, or, with regard to the aggregation. from an extension near to rupture, or with respect to both mixture and aggregation

it

it may be from these causes mentioned under &c
with regard to the overplus of water, I have said
that this may proceed from original stamina &c.
it will be evident here that the word from is to be
repeated to weak aliment &c. and the meaning
of all this I hope will be sufficiensly under
-stood. In the 2 place, the Debility with flexibility
may be from weak cohesion of the concreting mat-
-ter, and that may be again from heat, but the
other two are more properly connected with
what is above, as affecting the mixture and you
will further observe that there wants a comma
after micilage. with regard to heat I mentioned
the ambiguity, whether its deminishing the
Cohesion might not be compensated by its abstract-
-ing the moisture, with regard to the matters ex-
-ternally applied, there may be some difficulty
in distinguishing between matters affecting the
concreting matter as introduced by the external
channels of nutrition and from without but if
you consider the solid either in its formation
or as already formed, with respect to the first
take the very formation of it, matters are in-
-troduced by external channels, but when I
speake of the external matter, I speak of it as

applied

applied to the body as already formed, and ∞ of water applied to the fibre or solid already formed, which I particularly mean in B. I have said in my last book that the matter that may be thus externally applied may be considered as very various but that chiefly it is an aqueous moisture, but I would not be understood there as excluding every thing else, I do not pretend to say what may be introduced in this way, and so I say here, water mucilage, which I consider as the same, it being the water only that is introduced, and so perhaps with regard to oils, and I have put an &c. implying that there may be various matters introduced, as saline matters according to Gaub. 3dly from extension near to rupture, that I have explained that the extension by the application of extending powers is indeed constantly growing less & less, thus a cord is not extended by 2 tb double the length that it is by one, but it is the nearer to an entire rupture, and a small addition will serve to break it entirely, so this Distractio rupturi proxima may be considered as a weak state of the solid. I have said with regard to the cellular texture, that the same debility with flexibility may proceed from an extension

of

of it. This may appear the same as extension applied more absolutely with respect to the Solid; but if I have a rod that is formed into various joints by means of hinges, I can by these alter the rod, without altering the proximity of the particles, and in like manner a rod may be formed into a spiral form, without much affecting the proximity so we may consider the cell: text. as capable of being drawn out to a considerable length without the particles being moved from one another so that this extension is different but supposing that it is now a quarter of an Inch thick if you draw it out till it is of the thickness of an eight of an inch it will be weaker, under the same title there is an erosion of the cell: text. as if blood vessels are eroded and the blood bursts thro them, also the cutting thro' some layers of a compound membrane, the Phrase, compound membrane may not be without some ambiguity, but I mean a membrane that is composed of a great number of different layers, and the most of the membrane by the Sypha anatomicus appear to be very complex, & a part being cut thro' the remainder will be weaker, thus merely in consequ. of the point

of

of a lancet cutting thro' some of the external layers of the Coats of an artery an aneurism may be produced, and I in the last place mention here, the taking away external compression, certain it is that the fact takes place however it may be explained, we find that when we have taken away a support that has continued for some time the part is relaxed. and lastly I say, Debility with flexibility may arise from the emptiness of vessels, whether that operates upon the tonic power of our fibres or upon the simple solid may be a question, but it is not necessary to consider it here

We have now got a new division opposed to the little a, marked by the little b, Debility with fragility, which you will find explained by the Debile, fipile of D. G. with regard to its Cause it may arise, from want of Humidity, we are ready to think that the cohesion of bodies depends upon the cementing matter ~~xxxxx~~ they contain, but we find that the Cement in solids is very often water, and therefore abstracting that humidity gives a fragility, so merely the effects of drying air gives a fragility. the same may arise from Cold, there is not the same

objection

objection to the Cold producing frazility here, as with respect to the bones, the same frazility is sometimes from dryness alone but more readily if cold concurs. I add from certain changes of the concreting matter, that may be too vague but I cannot render it otherwise there are changes certainly in the mixture of the concreting matter that can produce all the changes that take place in the solid I meant to compare it with the bile in B, I give an instance of both in the case of Scurvy, which is remarkable for weakening the Cohesion of our solids, so in Ansons Voyage it was noticed that old wounds and escars broke open again in consequence of the Scurvy which is certainly a frazility and a weaker connection occasioned by the insinuation of the concreting matter (some foreign) how it is insinuated is not certainly determined, so the Syphilitic acrimony has effects of the same kind, the common idea is, that it is the introduction of the Saline matter that gives this weaker cohesion to the concreting matter, but these are discussions that cant be entered into at present

We now arrive at another division that of the Capital ~~A~~ B. with respect to ~~Flexibility~~ Flexibility cohesion.

Table of the Simple Solid
placed here —

The Diseases of the Simple Solid are,

I. Those of the natural soft parts.

1. Mobility of the parts too great.

Debile Gaub. 157. 159.

A. With respect to the force of cohesion.

a. Debility with flexibility

Debile tenerum graile Gaub. 161. 1.

Debile tabidum Gaub. 161. 2.

α from an overplus of Water.

from original Stamina,

weak aliment,

want of Aliment,

weak concoction,

increased excretion,

imperfect application

β from weak cohesion of the concreting matter.

from heat,

vitiated nutritious fluid,

matter externally applied, water, mucilage oil &c.

γ from extension near to rupture.

δ from extension of cellular texture,

erosion of cellular texture,

cutting through some layers of a compound membrane,

taking away external compression.

ε Emptiness of vessels.

b. Debility with fragility.

Debile fissile Gaub. 161. 3.

from want of humidity,

cold,

changes in the concreting matter.

B. With respect to flexibility, cohesion remaining.

a. Laxity with elasticity.

Debile laxum flaccidum Gaub. 160. 1.

from all the causes of I.1.A.a. except γ,

want of tension.

b. Laxity without elasticity or flaccidity

Debile iners Gaub. 160. 2.

from an overplus of water,

long rest in an extended state,

a certain over-stretching?

N.B. This is as I copied from a Paper delivered by the Dr. in Print.

The Diseases of the Simple Solid are,

I. 2. Mobility of the parts too little, or rigidity.
Rigidum Gaub. 164.
A. Rigidity deminishing flexibility.
Rigidum tenax Gaub. 165. 1.
a. from an overplus of concreting matter,
from original Stamina,
much or very nourishing Aliment,
vigorous concoction,
vigorous application.
b. from increased cohesion of the concreting matter.
from cold,
external applications of coagulents, astringents, &c.
c. from considerable extension.
d. from long rest in a contracted State.
e. from the condensation of cellular texture.
f. from a new growth of cellular texture.
g. from the shortening of cellular texture.
h. from a new growth of cellular texture joining parts naturally separate.
i. from full vessels.
K. from vessels becoming solid.
B. Rigidity destroying flexibility
Rigidum durum Gaub. 165. 2.
from ossification,
petrefaction.

II. Those of the natural hard parts.
1. Flexibility.
Debile flexile Gaub. 160. 3.
A. from a deficiency of hardening matter.
B. from the softening and washing out of hardened matter.
2. Fragility.
A. Spongeous.
Debile fragile spongiosum Gaub. 160. 4.
a. from erosion of gluten and oil.
b. from putrefaction of the same.
B. Vitreous.
Rigidum fragile vitreum Gaub. 165. 3.
a. from the too great drying by age.
b. from the deficiency of oil.

cohesion remaining this again following D. Cl. is of 2 kinds Laxity with Elasticity and Laxity without Elasticity, or Flaccidity, comprehending the debile laxum flaccidum and the Debile iners of D. Cl. with regard to the first, the Laxity with Elasticity, its Causes are first all the Causes of I. LA. 2 except γ. Here is the manner of making references from one part of our table to another, I say it arises from all the Causes that are enumerated under litlle 2, which is a subdivision of the Capital A, which is a subdivision of the arabic figure 1, which is a subdivision of the romen character I. so that it comprehends all the Causes that are marked by the greek letters, except γ, which rather gives a degree of rezidity, for the further any part of the solid is extended, the lepeasily it yields to additional Causes, or. another Cause of Laxity with Elast.ty may be from a want of tension, if I have explained in what manner the contractility or elasticity depends upon this, it will appear evident that the want of tension must give the most considerable Laxity and that which is properly opposed to debility only in supposing that the stretching powers are not applied, what these

are

are we will afterwards have occasion to consider with respect to the Laxity without Elasticity or Flaccidity. The Debile ineris of G. has said that it may arise from 3 Causes, and first from an over-plus of water, for the water in a certain proportion is a means of Cohesion, yet in over proportion it reduces the matter to the state of water itself destroying all Elasticity, it may also arise from long rest in an extended state. I formerly said that Flexibility and elasticity supposed the motion of the parts upon one another, but this is either increased or diminished by their more or less frequent exercise, in so much that if the parts remain for any length of time without moving upon one another they lose that power, if they are in a contracted state, it is with the retaining of their Elasticity, but if there is any extension if the parts are in a stretched state it is with the lapse of this. I have added another but I have put after it a point of Interrogation, which implies that I am doubtful how far I was right in adding it. you will find in D. Gaub. in his 162d paragraph where he is enumerating the Causes of Debility, among the rest he has violento partium ultra communi distractio. I was just

speaking

speaking of this, and telling you that I do not very well understand it, and it is ambiguous, — when we see the effects of strains which are attended with a loss of tone, but it is very doubtful whether it is not a state of change in the moving fibre more than a state of st. d. yt. There is such a case as the violenta partium ultra rorum — distractio, a distraction that seems to destroy that tone is certain, but whether it belongs to the st. or not is doubtful. I find no instance of it in the inanimate solid, we can hardly get the finest fibres of hemp or silk but we find them a compound of a still greater number of fibres so any compound cord by being stretched, before it breaks altogether a portion of its fibres breaks, thus when a cord consists of a hundred ~~strings~~ single fibres, if 80 of these are broke, — the 20 remaining will not be sufficient by their contractility to recover the whole. I know no other instance of this kind, when very soft Iron is stretched it is actually from a Degree of breaking, from a distraction of some of the particles to too great a distance, how far an st. is capable of any such thing is difficult to ascertain by any observation, However

I

I have set it down in this manner. These are all the several Cases of the Debility of Dr. G. our 2 Division with respect to the Diseases of the naturally soft parts, is that of mobility of the parts too little, or rigidity, the rigidum of G. we he considers as effectio prioris opposita I immediately proceed to the 2 different Cases of it the Rigidity diminishing flexibility, the rigidum lenax of G. and the Rigidity destroying flexibility, the rigidum durum of G. from whom you may take the definitions again more particularly with reg. to the first, the rigidity diminishing flexibility, the rigidity most commonly considered by Pathologists. I was doubtful in what manner to arrange the variety of Causes, I have excepted them all therefore together, tho' they might have been subdivided, if we had first considered the mixture, then the aggregation and lastly the organization. The first cause is to be understood as opposed to the over proportion of water, and that from original stamina &c. are all understood from the explanation we give under the former heads in 6 I have said, From increased cohesion &c. and here I have by passed in putting the Causes effecting

aggregation

aggregation before that affecting mixture but it is all one, now that I have explained it so, whether I should not have introduced vitiated fluids, and whether in fact that matters increasing the Cohesion are insinuated in the way of nutrition. I have marked the effects by external application of Coagulants, astringts &c. as alcohol which may be introduced with the nutritious fluid, but it is to me probable that thus introduced it has no effect, or by adding water to alcohol it loses its power, and Brandy will not coagulate the serum when alcohol will, and as a very considerable dilution must be here applied, it cannot have this effect wt. regard to astringts the same doubt will occur and the same reflexions will be made to saline matters as alum may be introduced into our nutritious fluid, but with regard to both the spt. of wine and alum, I must go back to take notice that there is a probability that nature has provided in such a manner agt. the corruptn of the nutritious fluid that these substances cannot be admitted by the secretions, and in a very great state of dilution they cannot have any such effects, and therefore

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I think I am right in confining these effects to the external Application of such Substances — You will observe that the term Coagulents, should be Coagulants. With regard to the Alcohol it is certain that applied to any part it hardens it. Whether any other can be introduced is doubtful, when the only other Substances that has such a tendency, are the concentrated Acids, and these externally employed rather destroy the whole Substance, and in a more diluted State their coagulating Powers are doubtful. With regard to astringents I do not know a more difficult Matter than the rationale of their Operation, that they are insinuated into the Mass of Matter and increase its coherent Powers is a doubtfull Supposition — & how they operate, whether by abstracting the Water &c. is not yet determined. It is the Theory of tanning which has given occasion to the common Opinion with regard to this Subject, and this is a Theory, that is equally difficult, and to me it appears very doubtfull if it does increase the Cohesion of the concreting Matters, but several of these Definitions require a further view of the whole System. I have left an &c. for some other Suppositions of other Matters.

The third Article C. from considerable Extension I have explained, as also the next one, from long[illegible] in a contracted State, which is one of the most common Causes of the Rigidity of the Parts &c. from the Condensation of Cel: Text: &c. from the Shortening of Cel.

Text: h: from a new growth of Cel: Text: joining Parts naturally Seperate – I see a fault here, in f. instead of a new growth of Cell: Text: I would wish to say, from an Additional Growth of Cell: Text: forming a Part of any Membrane, I suppose that may receive an addition, wch you may call a new growth, but it would proceed better, as the same Phraze immediately follows in h. if you read it an Additional Growth of Cell: Text: There is no instance of this more remarkable, than in the Dilitation of any Cavity Slowly and gradually formed, the layers of the Membranes are encreased by a new Growth, but in the case of the joining Parts naturally Separate, it is a growth altogether new, and you will find more or less of Cell: Text: joined between 'em, by which they very firmly cohere.

With regard to g. the Shortening of Cellular Texture you will readily understand it, if just now two Parts are joined by a cell: Text: of 2 Inches in length – Viz you take away one Inch in the Middle, & unite the two Extremities, now the Parts are only connected by an Inch of Cell: Text: & will not have the same Mobility as they had before, so that the rigidity of the Part must be encreased; nexpt I say in i, from full Vessels, & lastly in k. from Vessels becoming quite Solid in the three Ways I have explained, and lastly

in these you will find to be the Causes of the rigidity deminishing flexibility, Of the rigidum tenax of Gaub. But there is a rigidity of the soft parts in which the flexibility is entirely destroyed and that may arise from 2. Causes from a Deposition of hardened Matter which may be of two kinds.

1. The most common is, the Bony, & so it may proceed from Ossification but there is an other kind of an Earthy nature, we employ the Term of Petrefaction.

With respect to the Natural hard parts, which make our Second Division. and first of a too great Flexibility of ten, the Debile flexile of Gaub: it may arise in the first place from a Deficiency of hardening Matter, and 2ly from the Softening or washing out of hardened Matter. As in the Case of Rickets, where the bones don't take on their hardness and we have Reason to believe, that it is from the Matter of the whole Mass of Blood not furnishing the hardening Matter, and when hardening Matter has been deposited that may be again Washed away.

With respect to the 2d. Species of Rigidity or Fragility, the Stongeous & Citreous, they will be understood from what I have added with respect to the Oil, I have said what share it has in preserving the proper Consistence of the Bones, or the Stongeous State may proceed I have said from a Putrefaction or Putrid fermenth

introduced and destroying their Cohesion, which is the foundation of the Caries that takes place here, that the Vitreous can proceed from Condensation I cannot admit, but it may from the 2 Causes I have mentioned — I hope I have now put you in a way of understanding it very fully. – You will still reap great Advantage in acquiring a proper knowledge of this Subject, by observing, how it is treated by certain Writers, you will find a Short Sketch of it in D^r. Gaub: Sect: 162 & 166, which you will consider at your leisure: and Several of the Boerhaavian School have treated it with uncommon Deligence as D^r. Gorter, Siriver &c.

We have now finished all that we propose to say on the Subject of the Simple Solid, we shall tomorrow enter upon what may be considered as the Vital Solid – or in its more common Appellation the Nervous System.