

60 joint will be felt only in the knees and
ankles in Rheumatism. As oscillations
must in some measure be as the tension
of the part, and as tension must depend
on the fullness of blood vessels, Inflama-
tion must consist in tension, sensibili-
ty and communication of oscillation. So
a little oil thrown into the rectum will
relieve a stranguy. I shall have another
occasion to shew that the effects of bath-
ings, frication and anction have not hith-
erto been well explained. There is
then hardly any instance of a particu-
lar sympathy depending upon the com-
mon origin; it may be explained on
the supposition of a nervous power in
the parts, and in the common origin.

You may add sentient principle but it
will not explain the cause. It makes us
forget the connection, I had almost said the
subjection of that sentient principle
to our mechanical part. I shall find an-
other occasion more proper to take
notice of fair instances of particular
sympathy, without affecting my present
doctrine. —

Remarks. —

The great share that the nervous power
has in the animal oeconomy makes
this part very important; therefore we
must be anxious to know it, and diffi-
culties only can turn us aside. But I
fair hope we have a foundation to go up-
on, and therefore reason to enquire into
it. The nervous system is constantly en-

62 Discoursing to restore its equilibrium;
if therefore we study the ~~causes~~ of equilibrium;
if we study the ~~causes~~ of affection
and habit, and if we can make
out the communication by contiguous
and continuous parts; we may in a great
measure arrive at a tolerable knowledge
of it. I confess I have been somewhat pro-
lix; and I may give a better and shorter
order another time. There remains
the consideration of the particular
senses, but as the greatest part of it is
anatomical I shall pass it over. —

— Part third. —

63

— The Clinical Physiology —

— Sect. LXI. Tit. 17.th —

This, which I informed you was to make
my third part, contains the doctrine of animal
fluids, considered as mixed, as being ~~dis-~~
by exhausted and repaired. What I am to say
is contained in the following few heads. First
the separation of them in the functions
of chylosification and sanguification. Second-
ly the separation of these in the secretories.
and lastly the two chief applications of the
last in excretion and nutrition. It is a large
subject comprehending a great number of
particulars. The best order is not yet de-
termined. Bartheolin followed our order. Haller

He followed a different; he has given a chapter distinguishing nature & indole, and only afterwards considers the nature of animal fluids. Both methods have their advantages and disadvantages, but Boerhaave is the best. Before I enter upon this part of my work I shall premise two remarks. In the nervous system we considered the laws of a power that admits of little illustration from the other parts of nature. Our present subject should not be so, and we should expect here more frequented paths. But even here we will not find all the clearness and certainty we would wish for. The chemical philosophy explaining all the various effects of mixture is

very far from being fully cultivated. And 68
we are to speak of mixts that are still
our generis. We shall find the changes in
animal mixture to depend upon fermentation, which is acknowledged to be very mysterious; and we can not every where bring
this matter to general principles; And let our
body think that the nervous system is to
be deserted for the chemical since equal
doubts attend both. The order I have marked
out is attended with the consideration of
a great variety of functions. In Boerhaave
begins with the opening of the mouth, Mastication; but these things are so strictly connected with analogy that they should
not have place here. I imagine that

66 you all observe, a vast deal of interruption
would attend the consideration of these
several functions. —

Consideration of the fluids and their
applications to the purposes of the animal
economy. — Animal fluids are
made up of the aliment taken in. It may
be supposed that there are some original
stamina, that are not only the proper foun-
dation for the whole, but that subsist thro-
the whole of life. Animal are in constant
waste and decay, losing a portion of their
bodies daily and hourly. These parts going a-
way, we find are changed after a slower,
but a different process from the fluids: how-
ever in the course of a year there is very
little, if any of the same parts in the body.

All these in an adult animal are suppli-67
ed to be properly formed of elements taken
in. Next animal substance is formed of ve-
getable, which most animals feed imme-
diately on. There may be a specific diffe-
rence in the fluids and solids of different
animals; yet they are generically, so much
the same, that we conclude they are all
formed out of vegetables. Some animals do
live upon other animals alone, but these
others are nourished by vegetables; ~~then~~ we
proceed generally but one step down, for the
carnivorous, as I said, live upon vegetables
or at farthest we go but two or three steps,
for we at last land them in the vegetable
kingdom. Perhaps some difficulty arises
with regard to the first kind; But it is

68 Still probable, that there is no matter pro-
perly animal, and which can not be treated
vegetable. Next animal substance so formed
of vegetable differs considerably from it. the
vegetable aliment is taken in in its own
proper quality, and the change is universally
made in the Body of the animal. now
we are to enquire in what manner this
change is made. The change is first made
in the stomach; the vegetable texture is
chiefly broke down in manducation, but
the change of qualities first occurs in the sto-
mach. Man naturally lives upon both
kinds, but we have chiefly to consider the
vegetable. The operations of the stomach
may be reduced to three. viz. solution,
diffusion and change of qualities; which last

I express by the term assimilation. For 69
diffusion I formerly used the term mix-
ture. — SOLUTION must depend upon
a proper menstruum, with a proper divi-
sion of the solvent; a frequent agitation
of the menstruum with it; and a suita-
ble degree of heat and perhaps application
of air. The menstruum here has been va-
riously judged off. Before chemistry they
supposed a peculiar menstruum and vari-
ous Hypothesis. The menstruum chiefly
consists of the liquid parts of our aliment,
and is chiefly water however impregnated,
nor does the solvent power of the menstrea-
um differ from the action of the water,
Next the Saliva coming from various
sources makes a part of the menstruum.

70 see Haller. The gastric liquor from the
extremities of the arteries opening into the
stomach, and perhaps oesophagus. Thirdly
Mucus from the mouth, oesophagus, and
internal stomach itself. There are beside
these, fluids occasionally regurgitating from
the intestines into the stomach, such as the
pancreatic juice, the intestinal fluid, their
mucus; and to all these is added a quantity
of Bile. No experiments ascertain any par-
ticular power, in all or any of these fluids.
Their fluid part is chiefly elementary, water,
and we do not see the properties they may
have besides. Further we not only know
not, that impregnations have any effect,
but we can discern their solvent powers more

more imperfect than simple water. 71
Therefore we consider the menstruum as
water. — Division of the Solvent.
There are various preparations of cooking
which divide our aliment, beside man-
dication, which is a gross triture neither
long applied nor going to minute division;
it only breaks down the grosser texture, and
admits the water more intimately. The so-
lution then is carried on by the powers of
the menstruum. A trituration was suppo-
sed to take place in the stomach, as in
the gizzards of our domestic fowls. But the
mechanism of these and the human stomach
is different, the Hypothesis has therefore been
deserted for these 40 years past; and therefore
Boerhaave and Petruson need not be refuted. We

72 are not interested in their disputes. We
now say that in division, all that the Stomach
can contribute is by preserving the
whole mass in constant agitation. The
chemic hydraulic is very inconsiderable.
The solution is promoted by the agitation,
on, by diffusing the saturated portions and
applying the less saturated. I must take no-
tice of a trifling particular to explain this.
We must not have the idea of stirring up
from the bottom a body that subsides to
it; the contrary here is the case viz to beat
down from the surface, a body floating on
it that it may be properly diffused. This
agitation is performed by the peristaltic
motion of the stomach. Other assistance

are placed in the action of the Diaphragm 73
and abdominal muscles; they have been
said to triturate but their powers are but
trifling in that respect. Their actions
are alternate, therefore their pressure is in
proportion to the resistance they give in
their alternate dilatation. It would be still
more trifling to speak of the pulsations of the
aorta or those of the arteries of the stomach
and neighbouring viscera. The last assistance
is that from heat which is a principal
means in expediting and producing solution.
But it has been too much exaggerated. It
being said to be nourished by the heat of
the liver and surrounding viscera, leads
to the consideration of a focus of heat.
All heated bodies preserve their heat accord-

74 going to their bulk; hence the stomach
preserves its heat more steady and constant.
It would be thought that colder matters
taken in would bring down the heat of the
stomach, which it would do if it was not
for the heat of the contained mass. This heat
is not above 100 degrees of Fahrenheit's ther-
mometer, if greater it would coagulate
vegetable and animal matters. It is suffi-
cient to favour the solution. I have
added that perhaps air is an assistance of
solution. It is a curious question to deter-
mine if air does occur here and in what
manner. It is taken down the oesophagus
by the mucus and aliment; it is in the sto-
mach rarefied and expanded; and the chan-
ges of the air must considerably contribute

to the agitation; more so than the other 75
powers. Perhaps also it operates in a dif-
ferent manner. These several powers do not
go far, nor is the solution here any way con-
siderable. The animal matters are more
dissolved than the vegetable; but it is their
softer parts, while the membranous go out
almost untouched. There are then other pow-
ers of solution in the progress of the matter
along the alimentary canal; and the obser-
vation is much more strong. As to vegi-
tables they are still less liable to be dissolved,
and the fibrous parts of these do pass the
alimentary canal almost untouched. Seeds
also escape in the same manner. Such
is mustard which is not brothe, but a little

76 swelled. By the effects of mastication
and maceration the fluid parts are dissolved
and washed out, and in a great measure the
cellular texture is broken down if not mi-
nutely diffused; this effect takes place in
vegetables, and the operation is more im-
pore in animal food. I will say that
these powers are not sufficient for the ef-
fects I have spoke of, and we must look
for other assistances. —

— Sect. LXII. Feb. 18th —

Many think that all that is necessary to our
animal aliment is solution, and some think
so also with regard to our vegetable aliment;
to omit the nature of the menstruum and
assistances of solution just now spoke of.
All the powers that Boerhaave and many

other physiologists think necessary, I have not
acknowledged; but still the solution is not
perfect; the more properly solid parts being
thrown out. We could not by the assistance
of solution, in the same time, operate
solution to the same degree out of the body.
It is enough to say we know other powers
are added, viz: the power of Fermentation
in its largest and general sense, as com-
prehending vinous, acetous, & putrefactive.
This we shall shew presently, is fit to break
down the most solid parts of animals or
vegetables; and I admit Haller's opini-
on that it does so, because it extracts the
fixt air. If you read over Haller, you
will find him present many doubts that

78 we shall have occasion to discuss. In the
648th among the other means of solution
he adds "Porro

"

"

parat". All very fair and a
certain proof that fermentation has the pow-
er of breaking down the cellular texture
and of preparing room for the fluid more
freely to enter. But this does not happen for
the reason that he adds "sed

"

adparent." We have
nothing of air as being the gluten of mixed
Bodies. Now by the several powers mentioned
the solution of our aliment may be under-
stood for the most part, in the case of all
these vegetable or animal substances that have

a water for their menstruum. But then 79
is manifestly present an oily matter,
it may be a question whether it be really
dissolved, and I must not discuss it till
after. Tho' I think it is dissolved, yet it is
undissolved in the stomach, where as well
as in the chyle and milk of animals we
find it in its diffused state, but it is ex-
actly diffused as appears from the white
colour. We shall treat it under diffusion,
Therefore I pass over to the second effect
of the operation of the stomach, viz:

Diffusion

Many have said that the solution of oil
goes further, and have talked of the sapo-
naceous fluid. I do not see any evidence of
this in animal fluids; But if we regard
its effects in diffusing oil among water, or