

100 worth; the 998 Page of his second volume,
8th section of the Book "quid de chyle
refiat;" This he comprizes in half a page
and hardly says more than what I have
quoted from his preface. *Deniac*

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"

" wherever you see that

dead roll of vague terms you may con-
clude there is nothing under "

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"

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" These are general
causes of general effects; but they do not
touch the particular production of the ap-
plication of animal fluids. You see
from this how much demand there
is for an attempt tho' it should be but

in the way of conjecture. The distinguish-
ing part of animal matter from vege-
table is its more ready and spontaneous
putrefaction, and giving out matters that
did not appear in the intire vegetable
and only in the vegetable when putrified.
There is an intermediate state between
the putrid and asepent vegetable. We
want to account for that. It might
have been thought enough to have taken
it up in the course of fermentation. I
must own that it is not easy to find
that from any observation in nature
else where. There is an acid and a
mucus that likewise appears, but no
art seems capable of stopping it at that
intermediate state. When animal mat-

102 less have lost the qualities of vegetable
they are not advanced to any state that we
can call putrid. I think the chief question
one with regard to the inter mediate state
is whether it is not the vegetable matter
running its course, or a portion of the
animal fluid that has gone further.
In the human species animal fluids run
fast into putrefaction, unless they have a
constant supply of vegetable matter;
this is evident in the case of surry and
fasting. It is probable then, that the
proper animal fluid consists of vegeta-
ble and animal mixts. In what manner
does that happen? Perhaps it may be of
simple unfermented vegetable as Boer-
haave has advanced. But I can not allow

that because a fermentation always takes 103
place. Therefore I conclude that there is
fermentation, and I consequently conclude
that fermentation to be necessarily the
essent. I know from experiment show-
ing that the mixture can be performed
by unfermented vegetables; and I now add
that vegetables in their vinous state can
not be combined in mixture with
animal matter. —

— Lect. LXIV. Feb. 20th —

I would undertake a proof that the whole busi-
ness of chylification and sanguification is
performed by a chemical, not at all by a
mechanical operation; I observed that it ap-
peared from the whole history of the human

106 economy, from security and fasting, that the animal fluids can not be preserved but by a certain mixture of vegetable and animal element; and the question is, in what condition is the vegetable element applied to the animal fluids: Perhaps, I said with Boerhaave, in its entire state; but I imagined the vegetable under goes a change; first viscerous and then acedent. I said that the mixture of vegetable and animal was incompatible with experiments and analogy. I think all the observations that support fermentation in general, lead to an acedous fermentation. Vegetables in their acedous state may be mixed with animal fluids; The mixture of vegetable acids with Bile is an

exception. The bitterness of the Bile, and aced-108
vity of the acid are changed, and the yellow colour of the Bile is changed into a green. The acid appears very frequently in the stomach is very rarely appears in the intestinal canal after the bile has been applied; and it seems to be a purpose of the economy to cover acid with Bile. Now it is enough that I have given you what appears to be the probable theory; that the production of animal fluid is by a vegetable acid prepared, and that the rest of the work is finished by the application of a certain portion of animal fluid. The saliva and gastric liquor begin the business in the stomach; the covering the acid is only performed, as further advanced, by the

106 affusion of the intestinal liquor, and the pancreatic juice, the former is akin to the gastric, the latter, to the saliva; and lastly, by the bile. But the reflux lymph in its passage thro' the lacteals to the thoracic duct also helps. Further these united masses are poured into the common mass of blood immediately before it is applied to the lungs; and tho' this may be a principal organ of sanguification, yet it is not finished here; If the blood does remain in diffusion it is not finished but in the common bloodvessels and general circulation. I shall say how much nearer we can go when we come to talk of the blood in the greater vessels; each of these means would bear a good deal of discussion. The

covering of acid, as I have said, depends on 109 animal fluids applied. The sputatores have their stomach liable to acidity; and when the peristaltic motion of the stomach is weakened by various causes, the acidity appears; because that weaker action does not emulge the exhalant arteries, or bring out sufficient gastric liquor. Whatever disease in these organs detains our vegetable aliment a certain time beyond its natural length, gives occasion to acidity. These prove without doubt that the fermentation of the stomach will run on to acidity, if it was not covered. From this theory we can see why nature, for final purposes, as she does in other cases, has made acid stimuli to the stomach, that by bringing out gas:

108 tric liquor, it may provide its own re-
medy. Beside the use of the Bile in cover-
ing acidity in the intestinal canall, by
it the oily and watery parts are blended, or
diffused, if you will, into a more homoge-
ous fluid. The Bile has no other quality
to do that than by its ~~viscosity~~ acidity; Oil is not only
diffused, but it seems to be absolutely mix'd;
does not appear in the blood in its oily form.
In what manner is oil made to enter into
the proper animal mixture? It is probable
that it is by the union of acid. It would
require some chemicall Detail; but the sa-
peneis, of acid and oil are well known;
so all mankind are ~~lead~~ to take oil in
their aliment; and we choose to take oil
in our fresh vegetable aliment, that especi-

ally which is ~~fresh~~ acident; these must ¹⁰⁰
mutuall contribute to cover each other.
Both acid and oil do disappear in the
common mass of Blood; Here chyle is
form'd. I can not say but it is absorbed by
the lacteals, and exclusive of other matters.
So nature pours out fluids into other ca-
vities which are again taken up by other
absorbents. But the anatomists have ^{yet} never
been able to fill the lymphatics by their
extremities unless where they wound them,
and then they absorb water oil &c. Many
observations are against us, and promiscu-
ous absorptions especially appear in the
lacteals. They do absorb other matters, but
only in so far as they are dissolved in the

110 chyle. I observe this with a view to the
separation of the faeces from the chyle.
Very probably a putrefaction takes place in
the intestines, which forms a matter that
is not miscible with the chyle. What is re-
guted is pushed on slowly thro the canal
till the more fluid parts are taken up
by the absorbents. Whether or no the Bile
occasions a particular precipitation, and
whether a considerable portion of the faeces
are formed in this way you may judge.
How far putrefaction contributes may be
another question. In the purest water
putrefaction separates a substance more
or less earthy; hence Boles, to obtain a
pure water proposes a putrefaction of

it. In some measure matter may be thus
far made fit to be carried along by
the chyle. It is certain that the animal
fluids themselves furnish a quantity of
feculent matter, as appears in the mecon-
ium. Further, as to the question in the
further progress, the chyle is taken into
the lacteals, and mixed with the lymph
refluent from every part of the body.—
What change this makes is difficult to
say; I will make some remarks on
it. In every cavity of the body to prevent
concoction of parts there is a fluid exhaled.
What is its nature we know not, or whether
it be promiscuous; the probability is that
it is of a particular nature only. This
fluid is reabsorbed but not directly returned

112 to the common mass of blood. It is re-
turned, after mixture with the new taken
in, aliment in the receptaculum chyli. As
to the nature of the conglobate glands, I
can not say what change is there under-
goes, but there appears a change. I will
point out a fact; that from the vastly
larger size of the conglobate glands, as
the animal is younger, they seem to be
particularly adapted to the infant state. Some
phula affects the lymphatic system which
which last is different at different times
of life. This disease commonly attacks
us in our younger years; on the other hand
I am disposed to say it is limited, and
does not occur under nine or ten months
after birth, and in nine out of ten it oc-

curs after two years old. What it implies 113
I am very uncertain; your conjectures
may be as ingenious, and soled as mine.
The next change after affusion of lymph,
is in the lungs. On the business of sangui-
fication much has been said, notwithstanding
which it is as uncertain as ever.
The frequent and constant change, in the
capacity of the vessels in the lungs, gives
an opportunity for a more accurate and
perfect mixture, especially as all the matters
proper to be mixed are brought together.
Much has been imputed, by the mathe-
maticians, to the pressure of the air
but that is now reduced to a very small
matter. We allow that the pressure of the

the air is somewhat, but it is demonstrable to me to be inconsiderable. It can only contribute to the mixture; and no other effect requires any further notice. They have thought of, first, absorption of air, but that theory begins to be almost entirely deserted; the absorption may be admitted as possible, but is not very probable, they may entangle and inviscate air. The means of air entering by the alimentary canal is much more obvious. Various have been the theories on this subject, but the progress of chemistry has corrected them. So even the theory of Brian Robinson is not supported with regard to the acid of the air, much less will it be applicable to

the Lungs. The change of colour happens there, which we will inquire into after this. It can be produced to a certain degree without the application of the air. Instead of absorption we must think the chief purpose is to give opportunity for an exhalation. A mephitic air ex-
haling from the Lungs is no longer doubt-
ful, what are the causes or purposes are not determined. We may say that mephi-
tic air arises from different Bodies in consequence of mixture. The putrefaction into which animal bodies run may be said to produce it. The venous blood may then, require ventilation to give occasion to exhale that, now loose lying mephitic

116 air, and it is not to be taken off but by the application of common atmospheric air. This is a conjecture. But this exhalation may be connected with the preparation of blood. It is possible then that the exhalation depends upon mixture and that the application of the chyle gives a separation of mephitic air. But that too is a conjecture and the subject tho' important has but lately been started. I would alledge that all the past theories as to the effects of respiration may be readily thrown aside. I need hardly say that the mechanical figuring and forming particles of size and shape is to be entirely rejected. I shall now take up the fluids as

they move in the larger vessels. — 117

Lect: LIX. Feb 23. —

With regard to the employment of animal food we know nothing more than the solution of it, tho' I am persuaded it may admit of some other changes than solution. Observations say that there is an acidity present in the stomachs of carnivorous animals, and that the pure solution of animal food with the admixture of vegetable, is capable of assuaging; but these observations are not confirmed, nor are the experiments, mentioned to support them. therefore we must now consider solution alone, or be open to new light upon the subject. We must next consider of what nature and

118 quality the blood is in the vessels. Dr. Boerhaave
essay de spontanea sanguinis separatione
has presented me in throbbing light up-
on the matter. And Haller on the nature
of the blood seems to keep by the opinion
that were 20 years agoe, except in a few
particulars. First our common mass of
blood appears to be a homogenous, but
it is a heterogeneous ~~mass~~ aggregate; I
shall therefore speak of it as such, and shew
its different parts. In the larger vessels
we should not perceive its parts, if it was
not that upon stagnation there is a sepa-
ration, which must guide us in our whole
enquiry, and therefore. First. If blood
be drawn and exposed to the air, we per-

ceive that it is a smothering fluid, and in
a short time loses a portion of its
weight. This has of late been shewn of
under the title of palidus sanguis.
and that will be greater or lesser accord-
ing to greater or lesser heat, or surface.
It concretes into a mass in a temperature
lower than that of the body. The mass
at first appears homogenous, and after-
ward, goes into two distinct portions. The
red part remains in a concrete state, and
by degrees gradually becomes more and
more firm. Also we find a considerable
quantity of fluid surrounding the red mass.
this is the separation of the blood into
crust and serum, and is the most common.