On Zymotic Disease

Not very good. Conquered somewhat in multigale. Remedies with Zymotic disease only.

There are some subjects which perfectly attract both the Physician, the Surgeon and the Accoucheur; for however varied their cases are generally, yet diseases governed by the same law, springing from the same causes + remediable by the same hygienic + therapeutic means, occur in the practice of all three.

The subject which I have selected for my thesis is such a one.

Zymotic disease occurs in the practice of the Physician in many forms, how many it is impossible at present to say. Let us as examples I may cite: Glanders, Cholera, Enteric Fever and as I shall try to show in Syphilis also
Many more might be added, but until etiology has been more carefully studied it is impossible to proceed anything like a complete list. In surgical practice Pyaemia is one of the commonest forms of supplicative disease. While infectious the term belonging to the same class is treated by the Accoucheur.

The name Pyaemia was given to them from the supposition that the infectious phenomena accompanying them were caused by the action of a ferment in the blood. We have advanced but little in the way of direct treatment in any one of this class of diseases, certainly not in the examples which I mean to select viz. Typhus fever, Pyaemia and Pyrexial fever.

In the first we generally leave the case to nature assisting her own cure, and hoping for the best, but with out trying anything in the way of direct treatment - is usually too late by the Surgeon as Pyaemia for it is entirely out of his control, and the Accoucheur knows Pyrexial fever as the dearest complication of parturition - We are taught
however in many standard works that we are told to attempt to cure
Pitcairn says "I do not like your sea-cures" and com-
pares the man who would try to do so with the foolish pilot who in-
stead of guiding his ship, attempts to quell the storm. Analogy is
not however a satisfactory way of reasoning, and even if it is per-
manent which I do not think this is. Why we should try to combat
some forms of disease I leave others
to nature. I move to the commonest
and most fatal I cannot see.
and as so many are annually
swift away by fever. I think it is
our duty still to go on trying
to find some means of success-
fully treating it.

The three examples which I have
selected have some analogues which
seem to point to a somewhat simi-
lar mode of origin—
§ They are all epidemic diseases.
and indeed are often epidemic
contemporaneously. This frequent
writer Wilson has pointed out.
with an example of this. Our surgical wards have suffered severely from an epidemic of Pyrexia. The Maternity Hospital has been closed on account of Puerperal fever, and our medical wards are crowded with puerperal patients. The epidemics of all these seem to occur under certain as yet unknown atmospheric conditions, so subtle as to have completely baffled the skill of the analytical chemist. The constitution of Typhus or Pyrexia will produce Puerperal fever in a puerperal woman. This has been amply proved by the researches of Dr. Hutchinson, Labatt, and Collins, as well as by Kennedy. That the constitution of Typhus or Puerperal fever will produce Pyrexia in a person who has suffered amputation of a limb is probable, but sufficient evidence is wanting to establish this fact. The direct exciting cause of disease is supposed to be some topic agent introduced into the blood, something material which can be transmitted from one patient to another.
transmitted even by a third person who himself is free from disease. In various other ways as, for instance, in cases of spontaneous origin we imagine it to arise from some organic body in process of decay. These poisons may be introduced into the blood in various ways, by the lungs, skin, or swallowed along with the saliva or entering through the gastrointestinal canal, or by inoculation. The same agent may be introduced by more than one of these channels, as e.g. in small-pox (as was pointed out by Professor Simpson in connection with this subject) where we have the disease arising both by contagion and inoculation. When this agent has entered the blood it produces there some fermentative or catalytic change which the constitution of the blood is not sufficiently altered. But the ferment or poison may be generated within the economy also. If the changes taking place naturally within the economy should be modified...
by arrest of secretion or excretion.
Suppression of area for example,
occurring from disease of the kidney,
acts in this way that area itself
undergoing a change, becoming
vascular.

Carbonate of ammoniac
as was supposed by Fleisch. This view
however seems to be contradicted by
the experiments of Dr. Apple of Berlin.

Matter probably therefore being changed
into some alkaloid resembling
Hydrargyrum or Bismuth.

If however the arrest of secretion or
excretion was not such as to produce
actually marked action, yet any
arrest of these functions allows elements
to exist in the blood which would
be less than under its tone than
usually liable to undergo catalytic
change.

It will be seen above that both of these
conditions exist in Pyaemia + Fever
//\ Peril fever; they occur also some
times in Typhus, as in cases where
preceding high temperature have
existed previous to the occurrence of
the disease.
I shall consider first the Pathology of Pyaemia and along with it that of
Puerperal Fever. In account of their
pathology both as regards the
symptoms secondary lesions.

The similarity between the surface
of the uterus after parturition and a
shunt, the contemporaneous occurrence
of the two diseases, their mutual con-
fusion. The similarity of their symptoms
and maternal anatomy, pointing to
a very close relationship if not a com-
plete identity in their pathology.

When attention was first
directed to Pyaemia, the so-called
pus which was formed in the blood was
supposed to have been abstained from
the surface of the wound. However
it is now ascertained that most of
the purulent matter described by the
older writers. was not pus, but merely
white blood corpuscles. This fallacy
was not detected until the intro-
duction of the microscope, which revealed
the difficulty of differentiating between
pus corpuscles and white blood cells.

This mistake however occurred long
after the introduction of the microscope.
in connection with the fibrinous clots found in the chambers of the heart after death, these often yield a purulent substance. This appearance has been lately proved to be due nearly to the fibrinous corpuscles entangled in the clot. If this rupture occurred in the pericardia it was much more likely to occur in case of pericardial fever. In all pregnant women have a large increase of these corpuscles, and here too it proved a great source of fallacy. The pus being in the blood, had to be accounted for of course, and various theories were advanced to account for it. One of these earlier ideas was that the pus was absorbed from the surface of the lungs by the lymphatics and conveyed by them into the blood. If however the spine were treated as the source of a lymphatic gland we find that it is impossible for a body the size of a pus corpuscle to pass through it. These glands consist of an anastomosing plexus, which in passing the capsule breaks up into numerous ramifications, and have with a number of follicles divided by a trabecular structure derived from the capsule. These unite and form papules which themselves containing
form the efficient vessel. Between the fol-
clees the molecular matters of the simple
thymic fluid, but they do not admit the
passage of bodies much smaller even than
a few corpuscles. This we see in the
lymphs of those who have been saturated.
In the colouring matters of the tattoo
are taken up partly by the absorbents and
are stripped by the first group of glands
in their course; these matters are far
d smaller than any few corpuscles.
And as it has been proved by experiment
that the corpuscles are the active agents
in producing degeneration of living tissue
this theory must be set aside.
That the pus was absorbed, the open
months of the blood vessels themselves
was a theory that had some support.
But the exclusion of the vessel is generally
complete before pus is formed on the
surface of the wound—the signs for
were agreed to occur before any pus
was formed there. And we know
that a few corpuscles cannot permeate
the walls of the vessels.
The best doctrine of one that received
considerable support was that of
Philistis. The pus being suggested to
be excised by the lining membrane of the veins. The inflammation here after in the veins around the seat of injury seemed to point to them as a cause. This view was advocated by distinguished men as John Hunter. Celsus and others showed that a clot of blood was always present in the vessel at the commencement of the inflammation; also that the purulent substance appeared first in the center of this clot, then in opposition to the wall of the vessel. All these difficulties are solved by the fact, that what the older writers believed to be pus was not to be. The purulent substance in the center of the clot consisted of the white blood corpuscles, which were seen plain so that we came near to conjecture as to the causation of these clots, these abscesses.

It was formerly supposed that they were caused by the inflammation in the wall of the vein causing it to bulge inward and to offer an impediment to the free passage of the blood hence the deposition of fibrin. But Virchow has shown that when a vessel is inflamed the epiteliated papies into the wall which oblige bulge outwards, and even after an abscess

mature
has formed it caused an inward bulking. Coagulation does not generally succeed. If however this state of matters goes on until irregularities & ulcerations have formed, coagulation will then succeed. But as I before said the hematite is not previous to this. These hematite forming in a vein grow increasing by the addition of fresh matter until the vein reaches one of large dimensions, but then they do not stop, but fresh depositions occur & a portion of the numerous projects, if this causes the true danger. The stream of blood is apt to break off. Portions of the plate carry them along with, until they reach a vessel with a caliber so small that they cannot pass. The parts beyond this exclusion are hemi-infiltrated & become either dangerous or else disintegrate from the want of material energy for the performance of its functions. We have already seen this multiple secondary peculiar to characteristic of typhoid & the causation of which is more satisfactory. - The other secondary lesions resulting in Pneumonia are Pulmonary & Pericardiac effusion.
Diffusion into the serous membranes of joints. These are universally ascended by the action of some virucule, and clasp the diffusibility from the multiple abscess, and called leucopuce affections. Their localization in different subjects being ascribed to the laws of selection. The same laws as govern the site of rheumatic and syphilitic affections.

They are clasped among syphilitic affectations. But neiour and thus ills have followed him, been satisfied with the explanation already given of the formation of a Numerous & the formation of the secondary abscess by parts of the pain of the clot being caused by

This is not going to the root of the matter. For determining the mechanical formation of these troubles by pressure from an inflamed vein the gods too further.

There must exist some cause. For their formation. It is not accidental. It is epidemic, & such a condition existing in one brain. The tendency to it is capable of being transmitted by contact to another. The same along with their formation however, general symptoms which seem to lead us to the
the cause. The general symptoms are those of blood poisoning, considerably
accentuated more occurring in some cases.
Texas — A patient who after an opera-
tion has been going on well, has a
shivering fit, often slight at first, this
is succeeded by a hot stage, accom-
panied by considerable acceleration of
pulse; the hot stage is succeeded
and terminates in perspiration.
After this, the patient feels to totally
well, but the paroxysm of fever soon
returns, generally within the 24
hours. The discharge from the wound
usually now begins to dry up —
In a day or two if we examine the
chest we find physical signs resembling
those of pneumonia. The patient
gradually sinks, with rapid breathing;
often supervening tachycardia the fatal issue
We have had these all the conditions
favorable for the development of a Typhoid
disease. Matters in the blood which
ought not to be there typically found
normally should have been killed, matters
easily acted on by any organic form
then in epidemics. The atmospheric
change before alluded to, which
might suffice to produce degrading these abnormal blood-constituents, or else to modify the actions from the sound or free to under them capable of producing catalytic change.

These conditions seem to me to bring us to the true cause of the formation of the thrombi. The protective action of many organic ferment on the blood is to promote and accelerate the deposition of the film of the blood. This having occurred we can easily conceive some of the film adhering to the wall of a vessel. How the deposition of film will be still more accelerated by acting there as a foreign body. The film of the blood following a general law is deposited around it as the clot is formed. This seems to be the only way of accounting for the formation of these bodies. It is also rational and consistent with experiment.

What I have said with regard to pyaemia will hold true in all its particulars with regard to Periopleural Fever. I shall therefore say nothing further about it.
I proceed now to the consideration of Typhus. Some difficulties present themselves here as Typhus is Spotted or Contagious Typhus has always been considered to be produced by a specific organic virus. It arises spontaneously sometimes but its more common origi

...
again to the difference in constitution of the blood. And this seems to be sup-
ported if we believe in the spontaneous origin of Ysphus. For no one, I think, con-
teinds as the identity of the virus arising from overcrowding and bad ventil-
ation with that transmitted from a patient laboring under Ysphus.

The spontaneous origin of Ysphus, however, admitted by all, this chiefly be-
cause contagion can be traced in the great majority of cases. But as far as the investigations have gone, and they have been pretty extensive, there

seems evidence sufficient to warrant the belief that spontaneous cases do occur. The cause assigned for the spontaneous origin, air overcrowding and bad ventilation. This is well accounted for by Dr. Carpenter in the following way: that owing to an abnormal quantity of Carbonic Acid in the supplied air, the quantity thrown off by the body is diminished, as to also the quantity of Oxygen inspired. Hence elimination of excreta matters is imperfectly perfor-
med and accumulation of Substances tending to putrefaction must follow.
place in the blood. Then there is an increase of these putrefiable substances given off by the lungs and skin. The air becomes charged with organic matters via state of decay. The chief product of which (adds F. Carpana) is Ammonia. This fact about Ammonia harmonizes with the general theory, that Ammonia or some compound of it was the poison producing the phenomena exhibited in typhus. Under these circumstances there existed the most favorable opportunities of developing Zymotic disease. An external effecting one + an internal one. The Ammonia theory was held chiefly because the breath of persons laboring under typhus was found to be highly ammoniacal. The blood also was found to contain a perceptible quantity of Ammonia. And when Ammonia was injected into the blood it was found to produce typhus symptoms in those symptoms occurring at the end of typhus. It is however I think more probable that the presence of the Ammonia is due to the Zymotic action of the ferment in the blood. For Ammonia will not enter the
degradation of organic substances. Our
get will it produce when injected into
the blood. The primary phenomena of
typhus, and we may admit that
the typhoid symptoms are due to the
presence of the Ammonia, which is
itself only a product of this metabolic
action.
This accounts for the want of success
attending the direct treatment of typhus
by the mineral acids which were
given to neutralize the Ammonia.
But if, on the other hand, we accept
the idea of the production of the phenomena
by the organic degradation, we have
indicated as a course of treatment the
administration of some remedy which
will stop such action. We need a
remedy which will stop ferments
or putrefactive changes. Such a remedy
seems to have been discovered by the
diligent researches of Dr. Polli of Milan.
He has after a long series of careful
conducted experiments arrived at the
conclusion that, Sulphurous acid
either alone or combined with alkalis
has the property of arresting all these
changes. He ascribes its action both
to any chemical change which it
It produces on the ferment, but believes that it alters its molecular arrange-
ment so as to render it injurious. It
the germ. His experiments have
been numerous and the details are
stated at some length. He
injected into the veins of several dogs
purified pus in a short time. The
animals became sleepy, lay down,
refused food. The respiration acce-
celated. Their symptoms of intes-
itive gave present themselves present bloody
abdominal evacuations and the animal
died about 7th day. An examination
after death the viscus membrane of
the intestinal tube is found congested
in place of ulcerations, thin but
numerous in the region of the pylorus
the blood dark fluid. He also
injected intramellar fluid, matter
taken from the district of a standard
horse, in all cases producing lytic
action. But when these injections
were practiced on animals which had
previously had a course of sulphate
of lime and soda, no such serious effects
were produced as all the animals
recovered. The facts themselves are
perfectly harmless, and remain as sulphate for some considerable time. They can be detected in the urine for several hours after they have been taken. A similar good result was obtained if instead of administering the sulphate by the mouth, they were diluted and mixed with the internal matter about the infected. This fact tends to reinstate practically the acumen of Dr. Antonianu. In these results, for the experiments have been very numerous, I think can be founded a natural kind of treatment for all diseases which depend as such a symptomatic action. And if such is a discovery greater than any since the institution of vaccination by Jenner; if that number of diseases it may be applicable, a thorough Pathology can alone determine, but, we already know, of many such, and these the commonest and most deadly of all, that human flesh to be the Cid. It only can be surely be used as a vaccine but also as a prophylactic agent. An epidemic of typhus has been dreadful, its victims by thousands.
would be robbed of its power, the remedy would be at the applicable in civil as in public practice and who shall count the number of lives that might be saved in a camp or an hospital by its timely administra-
tion. Like everything else that is new it will meet with obtuse com-
motion, but it demands trial, a fair and enlarged trial, at least in those diseases where our profession vigorously implores itself to have no resource, and where we must fold our hands and await an issue which we can neither foretell nor prevent.

James Watson.