

AN
INAUGURAL DISSERTATION

ON

The Pathology of Typhoid Fever.

SUBMITTED TO THE

PRESIDENT, BOARD OF TRUSTEES AND MEDICAL FACULTY

OF THE

University of Nashville,

FOR THE DEGREE OF

DOCTOR OF MEDICINE.

BY

Jako White, Jr.

OF

Kentucky.

1857 & 8.

JOHN YORK & CO.,

BOOKSELLERS AND STATIONERS,

NASHVILLE, TENN.

100

Dedicated
To the Memory of Daniel Drake M.D.
The profoundest
American Medical Philosopher
of his days
And who, tho' dead,
His labors live after him.
By
The Author

Pathology of Typhoid Fevers

Theories relative to all diseases have existed from time immemorial; and are yet calculated to lure the fastidious propensities of our curious race; who are ever upon the alert to imbazon that which is new, and dispel the old, tho' it be of axiomatic existence.

Now this faculty of the human mind is one of the grand provisos of Omnipotence, which enables man to look beyond his visible nature, and throw off the cowl of Roman Code, which hooded the intellect, and shaped its ends to the aggrandizement of its own peculiar views. For if we speculate, not beyond the grand truths of Nature which are daily made apparent to our common senses, how are we to comprehend the sublime and hidden mysteries of organic life, which theoretical speculations and investigations, hourly elaborate into an existence, Divine in itself,

and not less true, than Axiom^s. Theory, therefore we argue to be of importance, so far as it leads to the investigation of Truth; yet that truth when made manifest, if it conflict in any of its bearings with the Theory that led to its discovery, no longer is it worthy of preservation, nor should it be followed as a talisman, by which truth itself is to be ignored.

But it is not our object to discuss the many views that have been promulgated, relative to the cause, and different lesions of Typhoid Fever, but only to review its pathology, and to explain so far as we are able the causes of these pathological manifestations.

^{yet} He believes that it is now conceded that every organ of the economy, shares more or less, a functional derangement in Typhoid Fever; which originates from the absorption

of an organic poison, produced by Animal decomposition. For proof of this, we refer to the existence of this disease to a greater extent in Cities, and in places where the atmosphere is vitiated, than in the country where we breathe the pure air, blushed into sweetness, and fanned by the aromatic morning Zephyrs when first they begin to battle the heat of advancing day. Yet it may be said that this poison is also found upon our highest Mountains, and in every portion of the land, - which we admit to be true; - but in those dwellings well ventilated, and ~~managed~~ ^{managed} with cleanliness, Typhoid Fever rarely ever exists, unless the System has been impregnated by the poison in other regions where it is produced.

At least this is the now accepted theory out of the many that have been advanced

upon this subject, and we now give it as the most rational and conclusive to our mind of all others;— and in fact we are inclined to the belief that the internal decomposition of our own bodies, may be the primordial germ of its origin.

Whether this poison has any peculiar special physical characters peculiar to itself, we believe that minute microscopic investigations have not yet determined: yet its impairing vital property ~~is~~^{is} made manifest from its deleterious effect upon the blood, which we shall make as the primary basis lesion of this disease.

^{yet} This foreign stimulant is absorbed into the circulation, exciting it to undue action, and thereby destroying the equilibrium of its proximate principles. The fibrin instead of retaining its healthy standard, or being increased

as in inflammatory action, is reduced from 2 1/2 or 3 parts in the 1000 to ~~1~~^{one} and often even a fraction of a part. ~~in the same~~; which shows an undue loss in the reproductive vital power of that fluid.

It is also thought that the Red Corpuscles and Albumen are diminished in quantity; yet this fact has not been satisfactorily established. Now this loss of ^{the} Fibrin in the blood predisposes to Hemorrhages, Congestions, &c., either into the substance of the tissues, or on the surface of membranes; and these conditions ^{are well} known to be of frequent occurrence as complications of febrile disorders:

And not only do we find a diminution in the quantity of the fibrin, as is perhaps the case in the other proximate principles; but its quality is greatly vitiated, as well as that of the Red Corpuscles, albumen, &c., which gives

is an impoverished blood, unfit for the nourishment or development of the soft or hard tissues of the body. Now this abnormal fluid circulating throughout the system, produces secondary lesions in the solid tissues, which complicate the Fever, and are but the results of the primary cause.

The muscular fiber of the heart and circulatory medium, as well as that of the whole system, loses its integrity from a pathological nutriment, which gives rise to the softening of those tissues, and an inability to the performance of their physiological functions.

Therefore this being true, we can account for the variations of pulse, which ^{are} ~~characteristic of~~ the peculiar ~~form~~ ^{to} Typhoid Fever.

The blood being a "highly organized and vitalized fluid," has by the absorption of this poison "suffered a most important primary

8

Lesion, which deranges the relative proportion of its different ingredients, breaks the balance of its proximate principles, and thus entails upon it an inferior degree of organization, and a low order of vitality. Such may be established as its conditions in this disease by Chemical analysis, and to some extent by its imperfect Coagulability.

Now this inferior vitalized blood instead of affording nourishment to the different tissues, acts as an abnormal stimulant, deranging their functions, effecting Nutrition and Secretion, and there-upon producing excessive emaciation.

These secondary lesions are Physiological, - effecting Nutrition, Secretion, and Excretion. The former being the power of maintaining and nourishing an organ, as well as furnishing material for the special functions of other organs, is highly essential to the sustenance

of health; while the two others are of no less importance, as the one separates from the blood the proximate elements of digestion, and the other throws off the effete matter of the system.

Arising from these physiological derangements, we find a rapid decline in muscular action, as well as mental languor, which ^{to some extent} is attributable to the imperfect development of the blood corpuscles in the Mesenteric glands.

The blood loses its alkaline reaction from the want of a proper oxygenated equilibrium; and thus from an adynamic stimulant to the brain, we have a low muttering irritative fever which may manifest itself in raving delirium, but never in true inflammation. And here we wish to remark, that inflammatory action is in no instance a lesion of Typhoid Fever; - for altho

10

ugh it be attended with the most frantic
Favings, it is caused either by an abnormal
stimulant to the brain, or an effusion of ~~water~~
serum in the sub Arachnoid space, or by a
deficiency of blood to the brain. And again we
may have Typhoid Pneumonia, which results
from the failure of a proper ^{relationship} ~~equilibrium~~ between
the hematin of the blood, and the Oxygen of the
lungs; thereby differing in its most important
bearing from Inflammatory Pneumonia, which is
the result of Cold, and an increase of fibrin.

In this disease we again fail to have proper
inflammation of the parenchyma of the lungs; but
merely stagnation in the Capillary circulation,
from deficient Chemic-vital affinity.

And we are also inclined to the belief, that the
existence of Rigor originates as much from
the imperfect combustibility of the Oxygen and
Carbon, dependent upon vitiated red corpuscles

11
for their circulation through the system, as from
the abnormal stimulus of the diseased blood upon
the nervous Centers.

Now the basis of the 3^d, or Anatomical lesions
are dependent - 1st Upon stagnations in the
Capillary Circulation, from deficient Chemico-vital affinity.

2^d From a deposit of Casoplastic lymph.

3^d From Physiological Lesions of Peyer's Glands; enlargement, softening and ulceration of the
Mesenteric ganglia; and especially those
that correspond with the morbid patches in
the intestines; also ulceration of the pharynx,
of the cartilage of the epiglottis, softening of
the liver, spleen, heart and kidneys, hepatization
of the lungs, and congestion of the meninges of
the brain. The cause of this Capillary stagnation,
and Chemico-vital deficiency, has
before been attributed to the derangement in
the relative proportions of the different ingred-

12
ients of the blood; and this Cacoplastic deposit, is but a vitiated coagulable lymph that is thrown out for the healing of these lesions whenever they may exist.

As the ulceration of Peyer's Glands is considered by many as pathognomonic of the disease under consideration, we shall confine our remarks upon the Anatomical lesions, especially to this branch of our subject. Now for a correct understanding of the relation that this ulceration bears to Typhoid Fever, it may be proper that we should state, that much diversity of opinion exists upon this subject; and that many theories have been promulgated, presenting claims to plausibility, although their basis positions may be hypothetical and purely speculative.

One opinion is that the poison, though hidden cause, which gives type to the fever,

10
circulates with the blood through the entire system, and acts as a foreign stimulus to the irritability of the different tissues, and more especially are these Glands of Peyer sensitive to the impression of this foreign stimulus—thereby giving rise to irritation, inflammation, and as a consequence, supuration and ulceration.

Another by Stokes of Dublin is, "that during an attack of Typhoid Fever, a 'massa typhosa' or 'typhoid matter,' is deposited in the follicles of Peyer, first of a progressive, then of a retrogressive character. That it has no physical characters which distinguish it from other morbid products."

Yet he contends that although there may be no physical characteristics of a specific kind, peculiar to it; still it may have important vital characters decidedly specific;—just as two specimens of purulent

matter, one from an ordinary abscess, the other from a small pox pustule, may have no appreciable physical differences, yet, possess important and very decided specific vital differences?"

And a 3^d, which is far the most conclusive, and satisfactory to our mind is,

1st That in Typhoid Fever a morbid element is deposited in various tissues, but more especially in the follicles of the intestinal canal.

2^d That this morbid element is the basis of the secondary local lesions that complicate the progress of the fever.

3^d That, as Tubercular deposits soften and establish a low degree of inflammation that degenerates the tubercle into purulent matter, so also this Typhoid deposit, from its specific vital condition, soon passes into what is denominated ulceration of the glands of Peyer.

4th That there is no physical nor vital differ-

ence between what is denominated the "Matta typhosa", and other morbid products. For is its vital characteristics specific, or sui generis?"

In order that we may justify our belief in the four last propositions; we shall proceed to the review of the special anatomical characteristics of the glands of Peyer. And to do so, it is necessary that we should first notice the physical characters of each gland that empties into the intestinal canal, from the pylorus to the mouth of the rectum. First, we have the follicles of Lieberkuhn, scattered throughout the whole alimentary track, which are tubular in form, with extremities upon the interior of the mucous membrane. Then Brunner's glands, which are small granular bodies, situated beneath the mucous membrane of the duodenum, and opening upon its surface by minute excretory ducts.

Next is the liver, and pancreas, which terminate generally by one common duct, (the Ductus Communis Choledocus), (sometimes two) by a small orifice through an elevated tubercle upon the surface of the mucous membrane of the duodenum; - and in the large intestines, we have solitary glands which are alike endowed with excretory ducts.

Now as we have mentioned the peculiarity of each gland that empties into the intestines, we shall proceed to the anatomical peculiarity of the glands of Peyer.

As we pass through the jejunum, we will find a few isolated glands, becoming more and more agminated as we proceed to the lower portion of the ileum. Now these glands are situated in the substance of the mucous membrane, and whether they exist in the isolated, or agminated form, -

are but simple shut sacks, with no orifice or duct, by which their contents can be discharged. They possess as the other glands a peculiar secretion; and as it increases in quantity, the walls of the sack become more and more distended, until the mucous membrane that is imposed above from this enlargement, is ruptured, together with the sack, and its contents are emptied into the alimentary track.

Now we have a physiological lesion which is peculiar to each gland of Peyer; and Nature in remedying this rupture, obliterates the sack, and forms new ones. "Thus we are led to conclude" (says the author of this view of the subject) "that each set of Peyers glands serves only a temporary purpose, for as each fills its function, it is destroyed and others come into existence as this special secretion is re-

quired to be performed." The analogue to this peculiarity of Peyer's Glands says he, "is found in the Graeffian vesicle in the ovaria, and its rupture for the expulsion of the ovum, and then the final obliteration of the sack of the vesicle."

Now from this peculiar anatomical structure of the Glands of Peyer, - being void of a duct for the elimination of their contents, it is manifest that a lesion must be, and is produced; - which we shall denominate a conservative law of Nature, - attempting to avoid congestion, inflammation, and consequently suppuration.

In a healthy lesion, organizable Lymph is immediately thrown out, which produces rapid cicatrization, and soon every trace of the rupture is removed. Whether this "Matta typhosa" has any peculiar affinity

for the glands of Peyer, we are unable to say
 just how and inclined to be they are
~~determined, to these~~
~~circumstances~~ ^{determination, to these} ~~glands~~, ~~and~~ ~~are~~
 actually arising at the mouth of a duct for the
 discharge of their excretions.

Yet in Typhoid Fever, these lesions occur as
 in health; but, from the low degree of vitality
 and organization of the blood, we have thro-
 own out instead of an organizable, a
 Cacoplasmic Lymph; which fails to produce
 cicatrization, but serves rather as a nuclei
 of irritation from which a morbid action
 will spread, and thereby facilitates the
 breaking down of the tissue, and establish-
 ing an ulceration of these ductless glands.

Now hemorrhage may originate from
 transudation, on account of the vitiated state
 of the blood, and excessive ulceration of the
 intestinal canal; or we may have coagula-

ble blood thrown out from the open mouths of the capillary vessels, on account of the sloughing off of the ulcers of Peyer's glands;— these ulcers after perforating all the walls of the intestine, and affording an opportunity for the expulsion of fecal matter into the peritoneal cavity;— thereby setting up a low degree of ^{peritoneal} inflammation, or more properly congestion, — resulting in death.

From a ~~synopsis~~ of the above course of reasoning we are forced to these conclusions,—

1st That a specific poison gets into the circulation, and is carried with the blood through all the organs; and being a foreign element in the blood, produces more or less irritation in the different organs.

2^d The equilibrium of the proximate principles of the blood is lost, both in af-

ference to quantity and quality; - incapacitating it for any of the great functions of life.

This foreign matter acts upon the blood on the same principle that the specific poisons of Scarlet Fever, Measles and Smallpox do; requiring however longer for it to attain its specific Typhous Crasis, than for either of these latter diseases to attain their peculiar Crases.

3^d Is a physiological lesion; - and manifests itself in the derangement and failure of the functions of Nutrition, Secretion, and Excretion; growing out of a broken balance between the demands of the tissues and organs, and the material which the blood supplies them, both in reference to the quantity, and quality of this material, and also the abnormal stimulus to which it subjects them.

of ^{the} An Anatomical lesion, - which may occur in any organ or tissue; and manifests itself in the form of a Capillary Congestion; and in consequence an exosmosis of Cacoplastic lymph into the parenchyma of the different organs, or a rupture of the Capillary vessels with hemorrhage as a consequence. -

This congestion above mentioned, grows out of a failure of the capillary force of the circulation. The peculiar anatomical lesion of Peyer's glands resulting in ulceration, is a natural consequence of a point of irritation, established by a rupture of the sacks of Peyer in performing their functions, - inviting the deposition of cacoplastic lymph, which fails in the morphotic force of organization; and like tubercle soon softens down; involving in its own destruction, the tissue in which it is infiltrated. These

ulcers often being the seat of hemorrhages, and sometimes perforating all the walls of the intestinal Canal, - furnishing an opportunity for fecal excrement to be passed into the peritoneal cavity, with the dangerous effects consequent to such a condition.