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Thesis on the  
Origin, and Pathology  
of  
Typhus Fever  
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An inquiry into the nature and pathology of Typhus, a disease of such frequent occurrence, so destructive, and which has of late been raging Epidemically in many of our large towns, needs no prefatory remarks to excite in it an interest, or the belief of its being of the highest importance.

Difficulties have attended the subject from the unsteady character of the affection - for it is ever varying in its forms, and presents itself under different manifestations in different Countries and districts, and in different Epidemics, and is greatly modified by a multitude of Causes relating either to the circumstances attending its attack, or the subject of it - hence have arisen the numerous names which it bears - besides those of a general application, as Idiopathic, Continued, Typhus Fever, we have the terms Malignant, low, nervous, putrid, spotted, petechial Fever, Brain, Gastric, Bilious, hospital, jail, Camp fever, and others, to which may be added those of Gastro-Enteric and Affection Typhoide, as being chiefly in use amongst the French Pathologists - These fevers, and other deviations from the more common forms, ~~and~~ <sup>present</sup> such broad features of resemblance, as to declare the disease under all to be one and the same - and of its modification a rational explanation can for the most part be afforded. - I believe it to be an affection distinct and sui generis, always preserving under an extensive diversity in respect to phenomena not essential

the obvious marks of its Identity - I shall call it Typhus, or simply Fever - I need not enter into an account of the ordinary course and progress of the symptoms - These will appear more fully and comprehensively as I proceed. I shall content myself for the present, with observing, that whatever may be its proximate cause, (a matter for consideration hereafter) it is mark'd by a first stage of depression, and prostration of vital power succeeded by reaction more or less established and continued, during which there is manifested a derangement of every function, an affection, in short, of the whole organisation, Solids, & Fluids. It is almost invariably attended by Inflammation, attacking more especially particular structures, other organs, but not with the same frequency, being more or less deeply involved. It exhibits a natural tendency to continue but for a limited time, and to terminate itself spontaneously - On its resolution, the different functions and appetites that had been suspended, return gradually to their normal condition; the Capillaries eliminate abundantly excrementitious matters, some of the secretions and excretions occasionally becoming excessive, more rarely a hemorrhage taking place from a mucous surface.

The ancient Theories in regard to this disease, more numerous than any other, have been fanciful, vague, and groundless, and exist now only in the history of Medicine - The Modern theories, (as numerous appear also inadequate to explain the phenomena), are not based on facts, those that are the most pretended to be so, resting in attempts to resolve it into one of the local inflammations occurring during its course.

and leading to a denial altogether of its existence as a primary (idiopathic) disease — In order to shew the state of the question in regard to the prevailing doctrines of the present day, to give the most important facts connected with its pathology, and to see how far dissection has revealed its nature to us, I shall enter at once upon the appearances the different organs and structures present after death, and endeavour to trace the relations they bear to the symptoms & to the general disease —

The first that demands our attention, as being the most constant, is the result of the wellknown affection of the Intestinal Canal. In its more characteristic form, it consists of an inflammation soon passing into ulceration of the aggregate glands situated chiefly at the lower portions of the Stom. At the earliest period, the glands, in their elliptical or lengthened form, appear more develop'd, and are thus seen more readily and distinctly than in the ordinary condition — when held between the eye and the light, a minute capillary injection is seen confined to them, generally deepest at their circumference — from tumefaction and engorgement they soon become raised upon the surface of the intestine — Ulceration then commences on the most prominent points, extends irregularly, exposing the muscular and afterwards the serous coat, by penetrating which also it may destroy the patient suddenly — It may present the characters of slough and gangrene, or as convalescence occurs, may take on a reparative action, and leave cicatrices — When the Solitary Glands are the Chief seat of the Affection, they undergo similar changes of injection, intumescence, elevation, ulceration, slough; often we see

minute follicles in great number injected and slightly raised. - The enlargement of both varieties of glands frequently concurs - in many cases the mucous membrane in their neighbourhood, or independently of them becomes reddened, softened, and ulcerated. - The ulcers, from whatever source, often communicate one with the other and involve a considerable extent of the intestine in the same action. These changes occur by far the most frequently near the ~~Sto~~ <sup>Caecal</sup> Valve, and diminish as we proceed upwards; they are generally attended by an Enlargement, and softening of the corresponding Mesenteric glands.

This affection has received the name of *Typhus Enteritis*, from Bretonneau, and, as attended by an affection more or less decided of the general digestive surface, that of *Gastro-Enteritis* by Broussais, and has been declared to be the seat of the disease. Bouillaud, an ultra-disciple of Broussais's school, carries to the farthest extent this doctrine of Typhus being a simple phlegmasia - he affirms that it has no determinate course to run, that he stops it by depletion, and that it arises in its worst form from a neglected Enteritis.

Louis considers the lesion in question to be its essential anatomical character - making it *Pathognomonic*, he allows Typhus to exist where it is present, but denies it where it is not found, though the symptoms may have been the same, thus he has given a number of cases under the title of *Affection typhoïde simulée*, some of which it is clear were genuine examples of the disease - for it is beyond a doubt that cases do occur in which not the slightest en-

Also look at Chomel's *Lein Clinique*, reviewed in a late number  
of the *Edinburgh Journal*,

-largement of the glands is found, nor any injection of the membrane,

I have the respectable testimony of Thomet in regard to this, whom, my friend Dr. Hodge, heard declare in his Clinique, that he was compelled to dissent from Louis, as he had witnessed the most unequivocal cases, without the affection of the Bowels - and they are to be met with in Authors - When it is present, it bears not to the general disease the relation that should exist between Cause and Effect, being slight where this is intense, and vice versa. It differs also in the frequency of its occurrence and in its severity in different places, and in different Epidemics. From my own observations, and from what we must presume from the French writers, I believe there is a much greater tendency to it in Paris than in London. Again it continues sometimes after the subsidence of the primary fever. I have observed many cases of this kind, and one in particular was admitted into the Clinical Ward of Guys Hospital, during my apprenticeship there, in which ulceration of the Stomach remained, extended and ultimately perforated the Bowel in 2 or 3 spots, and was attended, not with the characteristic symptoms of Typhus, which had all disappeared, but with hectic in a patient under these circumstances may linger an incredible length of time. Emaciation from the previous disease, and the diarrhoea, increasing to an extreme degree.

But the acknowledged frequency of such a topical Inflammation accompanying Typhus, leads us to an opinion more worthy of consideration, which classes it with the Exanthemata, and as it

receives additional importance from the condition of the skin, I shall here state the phenomena that are observ'd in respect to it.

Notices exist in some of the Older writers of an Eruption on the surface in Fever, independently of Petechiae or true Echymsos but it has been only in recent times that much attention has been paid to it, or that correct observation has been made; It varies in appearance, and very much in constancy - occurs in some districts and seasons, and not in others, - presents itself more invariably when the disease exists in particular Epidemic forms; as was the case in many of our large towns, during the last Summer and winter when it was to be seen in almost every instance; it then became a striking and diagnostic symptom, and seemed to obey the laws that belong to the Eruptive affection of the true Exanthemata. Its characters are not fixed - In the most marked form there is an injection of the surface of the Cutis, of a tolerably vivid red, interrupted in points, bearing in short a close resemblance to that of Measles - Chiefly occurring on the trunk, sometimes on the extremities, and even on the face, appearing from the 5<sup>th</sup> the 8<sup>th</sup> day, and soon fading - in some cases from the commencement I have observed it slightly mottled develop'd, presenting an insistent mottling of the skin, as is seen on the decline of Rubella. Another form is that of minute specks or spots closely approaching each other, of a less bright color, often of a dusky hue, looking very much like fleabites, but disappearing under pressure. These differ, again from the scattered

rose-red lenticular spots, or papulae, which Louis has alluded to so particularly, and to which he attaches considerable importance, as regards the diagnosis - they are seldom seen but on the neck, chest, and abdomen; When my friend Dr. Kidge was in Paris, Louis pointed out these in almost every case, they were generally very few in number and often at great distances - I have not observed that they occur so frequently in London and Edinburgh. Another phenomenon considered in some degree characteristic by the same Pathologist, is the appearance of Sudamina, or of very numerous minute vesicles, perfectly clear, transparent, easily disappearing under a slight touch, being chiefly on the neck, chest, & groin. I have seen them on the extremities where the skin has acted most, also in other parts; the same importance is not however attached to these by others, who affirm it to be only the common miliaria Eruption which appears after profuse sweating, and that it is not peculiarly remarkable in Typhus.

The opinion adverted to, regards the topical affections we have described as an integral part of the disease, as bearing the same relation to it, as the rash upon the skin, and the inflammation of the fauces in Scarlatina, or the pustules of small pox, do to the fever that precedes and attends them.

This analogy is obvious, and is borne out by other observations. It is certainly a step in advance to be able to recognise the alliances of diseases, as it supposes a more accurate knowledge of them, the ultimate object being to appreciate fully and exactly the phenomena of each individual.

As showing points of resemblance and distinction, between the disease we are inquiring into and the Exanthemata, I would observe that,

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The origin of the former in most cases at least is from Contagion, a fact that is absolute with regard to the latter class in all cases.

In the former, there is a disposition not to be renewed, but it does attack oftener than once, and particularly so under fresh Epidemic's visitations. I know an eminent Physician who has been seized by it 6 times.

Similar facts must now be allowed of the others, though in these the tendency not to recur, and especially after a 2<sup>nd</sup> attack is very much greater.

The former is confined to the first portion of life; to the period between childhood and 50 (as an approximation to the truth) but prevailing most at the intermediate ages, the latter are still more confined to a younger age.

In the one affection, and the other set, the fever is primary and essential, independent of Inflammatory action.

The local affections of Typhus present not the same uniformity, nor the regularity as to the period of occurrence, nor as to their course, that may be affirmed of the inflammations of the skin, and other organs especially involved in the Exanthemata.

There are general resemblances as to other complications occurring in all, whilst there are peculiarities as to each.

They are met with after a similar manner in different types; Typhus varying the most; They rage Epidemically; they have a determinate course to run; in the one this cannot be arrested except in the earliest stage; in the others it cannot probably be stoppt at any; they agree therefore as to the limited benefit to be derived from art; and in the principles of treatment that are to be applied to them; lastly, many of the sequelae of their attacks are the same or very similar.

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Typhus agrees in its Pathology with some forms of Dysentery and with the  
Plague. There is a great analogy as to the anatomy and function between the  
Tonsils and other glands situated lower down the alimentary passage, and  
it is clear that the former are attacked by a specific affection accompanied  
by an independent constitutional condition sometimes assuming the worst  
Typhoid type, as seen particularly in the angina maligna, and the accom-  
panier of the putrid sore throat, the gangrenous ulcer of the throat, and  
patients have died rapidly of the severe constitutional, when there has  
been very little local affection, and these diseases occurred in Epidemics

The Plague had its general condition of system, the most suddenly ty-  
phoid, and its topical affections, its buboes <sup>or</sup> glandular and lar-  
-uncular swellings, and they varied in their relation the one to the other.

At La Charite, my friend Dr. Meeson, witnessed the inspection of a  
case, which bore the worst characters attributed to this disease. It occurred  
in a young woman who died soon after her admission into the hospital  
from the extreme prostration, In the groins the glands were greatly swollen  
and the cellular tissue was extensively sloughing to some distance  
beyond them - in the interior of the body were the most mark'd results  
of the deepest affection the Capillary system and the blood; the liver  
and spleen were enormously swollen and softened, the former was  
quite in a porous condition. The stomach was studded with  
large and dark ecchymoses beneath its villous coat, and similar  
extravasations were seen along the whole of the intestinal canal  
the kidneys were about 3 times their normal size, very flabby, Ecchymose

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on their surface, and in their substance, and the Pelvis in each was in a slough-  
ing state - the particulars of this case were taken with great care by Mayer.

Though I believe that the local affections of Pylorus which I have described  
as those of the other diseases with which we have been comparing it, occur  
specifically, yet as it is the aim of a scientific pathology to search into the  
causes of events, I shall endeavour to see how far an explanation of them  
may be found in the phenomena of the febrile state itself, on which I shall say more <sup>hereafter</sup>.

The depression of vital power more or less sudden, and the diminished action  
of the most important organs induced primarily by the exciting cause, are attended  
by an arrest to a greater <sup>or less</sup> degree of all the secretions and excretions, thus in the first  
stage the urine is found deficient in excrementitious matter, the secretion of  
pus from the surface of ulcers is suspended, and the granulations are dried up.  
When reaction begins to take place, and the skin becomes hot and dry, thirst is  
complained of, the lips are parched, the tongue becomes brown, then follow  
the evidences of depraved secretion in the glutinous adhesive matter, covering  
the latter, and in the sordes upon the teeth. Now this state of the skin and  
particularly of the tongue, and mucous membrane of the mouth, a part of the  
digestive surface, and the acknowledged index to its condition, leads to the pre-  
-sumption that similar circumstances hold of the greater portion of its extent,  
and especially of that occupied by the glands of Peyer and Brunner.

The debilitated state of the capillaries, their disposition to take on Inflam<sup>n</sup>  
-action, and the form of that action are evident from the characteristic early occur-  
-rence of ulcerations over the sacrum, and Trochanter, and from the sloughing of blist-  
-ter'd surfaces - that morbid matters pour'd into the canal under these

\* I know that it is doubtful whether the intestinal canal be deprived of the mucus secreted during health, the mucus is changed more viscid, and more adherent, but still it is secreted, although in a diminished quantity, as is proved by dissection.

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unfavorable circumstances, deprived of the mucus\* that protects it in health from the irritation of its contents, should excite Inflammation either in those portions of it where the intestinal contents become most depraved, or are retained longest in contact with the surface, or should involve its glands is what might have been expected a priori. Accordingly besides the ulcers we may find the living membrane in other parts, softened, thickened, ulcerated, or only injected, or having its submucous tissue infiltrated with serum, or a darker sanious fluid. These changes ~~take place~~ <sup>take place</sup> in the Stomach, Oesophagus, and Pharynx. Louis describes a condition of the former, which he terms "Erat Mammelonée" which occurred in his cases not infrequently. Dr. Cowan has seen ulcers in the Stomach and effusions of blood beneath its villous coat. Dr. Ridge witnessed a case under Louis in which he affirmed, ulceration to exist in the Oesophagus, as was clearly pointed out by very distressing symptoms the patient tediousy recovered, and he observed it was the third only he had known to do so. One was mentioned to me by a physician whose name I do not remember (It was Dr. Hodgkin I think) in which an ulcer existed in the back part of the Pharynx, and afforded an interesting opportunity of observing its changes corresponding with the progress of the disease. The only remark that could be made as to the rationale of the eruption upon the skin, would relate to the analogy and sympathy between this and the gastro-enteric mucous surface, and to the fact of its heat being greater than in any other disease except Scarlet Fever, and often more pungent and lasting, excepting only Scarlet Fever.

As another attempt to localise Fever has been made by Dr. Clutterbuck, who

would have us believe every case to be one merely of Inflammation of the brain or its membranes, we will next proceed to the pathology of that organ while suffering under it.

It may be at once remarked that inspections have proved that morbid appearances within the Cranium have not the frequency, nor the importance, nor bear the general relation to the disease that they have been supposed to do. As was said in respect to the Pleura, there may be no lesions, they may be slight, and wholly disproportioned, to the severity of the disease, and they may ~~appear~~ <sup>occur</sup> at various periods of its course, and this observation applies to a much greater degree in the present instance, It may appear at first singular that though symptoms due to the sensorium form prominent symptoms in most cases of fever, and predominate over those referable to the organs, either within the Thorax or Abdomen, yet an order the reverse obtains with regard to appreciable lesions - these occur to the greatest extent within the abdomen, next in the Thorax and least frequently within the Cranium.

This is to be explained by the facts, that the brain beyond all other parts, and its surface especially, shews deviations from its functions, from the slightest changes in its circulation and supply of blood, as well as from more evident alterations, as is verified by a variety of its diseases. These derangements at all times attract attention, - whereas those from other organs and arising probably from a more considerable organic change are slighter, and do not so readily excite observation. The Post-Mortem appearances that are met with belong to inflammation, or congestion

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Thus there may be an Effusion from the Arachnoid covering the surface of the brain  
at the base, or into the ventricles; Opacity and thickening of the membrane itself, the  
vessels of the Pia mater may be turgid with blood, the cineritious substance may  
approach more or less to a rosate tint, and the medullary matter, when sliced,  
may present more bloody points than natural, and either may have under one  
different degrees of softening, hardening &c. These changes occur more frequently in  
Dr Southwood Smith's cases than in those given by Louis and Breda.

In respect to ~~various~~ peculiar symptoms, such as, the sudden prostration  
of <sup>muscular</sup> strength power, the early state of tumor of the tongue when protruded, and of  
the extremities, the spasms and twitchings, more lately and towards the ter-  
mination of the disease, the subsultus tendinum, picking at the bed clothes,  
loss of control over the Sphincters, these affections of the muscles have led  
some to look for changes in the Spinal Cord or its <sup>Membranes,</sup> ~~coverings~~ they are,  
however generally to be referred to the Brain, and they are met with in diseases  
confined to it. Such lesions as occur within the head, have  
been found within the Spinal Column, but neither often, nor to any extent.

An important fact bearing directly upon practice, and referable to the  
brain, for some points, as arising from the impaired sensibility of the structures,  
is the insidious latency that attends all the local inflammations; We may have  
the intestine extensively ulcerated, without any pain from pressure, without  
diarrhoea, without tympanitis, in short without any of these symptoms having  
been present, perforation has suddenly taken place. In a case I observed at  
Guy's Hospital, where the complication seemed entirely cerebral, where consti-  
pation prevailed throughout the disease, where the abdomen was flaccid, &c.

and free from pain, the usual ulcerations were found in the Membr. In like manner, Bronchitis, or Pneumonia in both lungs may exist without cough or pain, to be detected only by the Stethoscope.

Without having recourse to the idea of a primary impression being made upon the Brain, any more than to its inflammation, there is abundant reason in the febrile state itself, as intimated above, why numerous symptoms should prevail that are due to it, and why traces of inflammation and congestion should sometimes be left, from its partaking in the general derangement of the circulation, and particularly of the capillary system, from the changes in the quality of its blood, and probably of its nutrition, and from its sympathy with the condition of other organs, & especially with that of the Stomach, & Intestinal Canal.

To turn to lesions within the thorax, An injection, and thickening of the Bronchial mucous coat, and an increased effusion into the tubes, are probably of constant occurrence - I have never seen a case free from Bronchitis, I have considered it as always present, and the remark is strengthened by the testimony of Dr. Stokes.

Pneumonia may exist in one or both lungs, and may pass on insidiously to its worst forms, these organs are generally in their lower portions, engorged with blood, or infiltrated with serum, or rendered impermeable to air, and in a state which has been called *Spontaneous Emphysema*, being dark colored, and easily breaking down, or they may be in a condition still more advanced, in which a gravitation and delay of the fluids take place towards the posterior and most depending portions, the diminished force of the heart's action is insufficient <sup>to overcome</sup> the obstruction to the circulation, and coagulation occurs under an almost complete stagnation of blood. An effusion of sanguineous

serum is sometimes found in the Pleurae. The heart usually approaches to a condition, in the extreme of which it is of a livid red color, its particles flabby, wasted and easily torn, its cavities somewhat dilated; attendant upon this altered nutrition of the heart, the lining membrane of the Aorta, assumes a darker hue than natural. The Spleen is very commonly enlarg'd and soften'd, sometimes to a considerable extent. The liver does not undergo such changes with regard to its structure, nor is its secretion so much altered as in Typhus occurring in hot climates. The Kidneys are seldom much affected - they may undergo the prevailing changes of softening and enlargement, A lividity of the muscles is sometimes seen after death.

With regard to the disposition of particular tissues to become affected, it is worth remarking that there is a tendency to ulceration in all the mucous membranes, for besides in those mentioned, ulcers have been seen on the Epiglottis, in the Larynx and Trachea, and in the Gall and Urinary Bladders, hence Louis' observation that in Typhus they occur on the mucous surfaces in an acute, and in Phthisis in a chronic form.

The serous membranes with the exception of the Peritoneum seem to enjoy in some degree an exemption - for instance, in Pneumonia secondary to fever, even where it is extensive and near the surface of the Lung, the pleura often is not affected, whereas in severe idiopathic Pneumonia, the membrane covering ~~covering~~ the lung generally partakes in the inflammation. The peritoneum is rarely inflamed, except from fecal extravasation, or from perforation of the bowel without it, when the action is limited to the vicinity, and is of a preservative nature.

The inflammatory process is modified in form and character, lymph or pus are not generally thrown out, it does not and particularly in some parts, become so often limited as when it occurs idiopathically by the effusion of plastic matter, but is diffused being attended with softening and discoloration and in a dynamic forms passing early into disorganisation and gangrene, circumstances that might be expected from the structures attacked having already been in a state of congestion and diminished vitality.

The important fact as relating to the nature of fever is yet to be stated, viz that death may occur without leaving any of the lesions we have described as in the severe cases in which no reaction takes place from the primary collapse of the vital Energies; the changes that exist are only in the intimate organisation of parts, and the vessels are filled with dark blood; in short an impression has been produced by the poisons, and a lesion has taken place secondarily in the blood sufficient to arrest the vital actions, before grosser alterations occur; whereas in ordinary cases, changes of the same nature, but in less degree are produced by the exciting cause, they are those which precede and give rise to, at least the affections of the different organs that do not seem such essential concomitants of the disease, their predisposition from climate, constitution, habits of life, and various concurring circumstances, determining the more particular complications.

It is a fact also, that during the course of cases not appearing very severe death sometimes occurs suddenly, and morbid inspections cannot reveal the cause; oftener the lesions that are met with are inconsiderable and inadequate to explain the event when taking place less rapidly.

Generally however in this country patients die from the conjoined effects of the condition of the system or the fever, and the Inflammation and congestion of important organs interfering with their functions, or death is induced by the operation singly of one or other of the following modes, or from several being more or less combined, as from Asphyxia; from the conditions we have alluded to in respect to the lungs ~~and~~ aided perhaps by their compression from Effusion into the Pleurae, and more especially from the accumulations in the Bronchial tubes - by coma or cerebral oppression from the changes within the Cranium - by Syncope from exhausted irritability of the heart, its diminished power being unable to overcome the obstructions from congestion in the internal organs, and large vessels - or by a gradual wasting of the powers of life, from continued disease, haemorrhage, diarrhoea, &c.

With regard to the Pathology of the fluids, as already intimated, they undergo earlier and greater changes than in any other disease - In what respects and to what extent they deviate from their constitution in health, Chemistry has not yet determined - Dr. Stevens states the Blood to be deficient in its serum and its salts, that the absence of the latter is the cause of its dark color. Its coagulum, even when <sup>it is</sup> drawn early, is generally soft, unclotted, and easily broken up - It may remain fluid in the large vessels, and cavities of the heart after death - So its change in quality, and the debilitated state of the capillaries are due as in Purpura, Haemorrhagica and Scorbutus, the appearance of Petechial vilices in worse forms of Echinosis, and haemorrhages from different mucous surfaces, to these causes too, are in great measure to be referred the effusion of Serous fluids into the Pleura, Pericardium, and parts of the Cellular tissue - Under circumstances

I am aware that some taking a different view of the nature of  
Fever deny the similarity between Yellow fever and Typhus.

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in which the predisposing causes greatly prevail, and the miasma is not diluted by fresh air, as in Camps, jails, hospitals, the filthy hovels of the poor, the phenomena alluded to occur more frequently - in such cases the factor of the evacuation is insufferable, death may take place on the 2<sup>nd</sup> or 3<sup>rd</sup> day; the body passes quickly into a putrescent state, and the contagion spreads rapidly. As it occurs in tropical climates, Typhus may be attended by a haemorrhage into the stomach, as in the "black vomit" - by livid Echy-moses under the skin, as in "Spotted fever," and according to the belief of some, by an effusion of the constituents of the blood, in certain proportions under the surface, as in cases of "Malignant yellow Fever!"

It is evident that the depraved condition of the blood, and of the secretions bears a relation to, and in fact arises from, the depressed state of the vital energies, and of the functions subservient to organic life. Dr. Stevens would have us believe the exciting cause to act by vitiating the blood and that all the other phenomena, take place from its circulation through the organs - An assumption that is altogether useless - for supposing a poisonous matter to be introduced into the blood, for it cannot itself be diseased primarily, according to our present knowledge, it is probable that its effects can only be produced by its contact with nervous filaments - the experiments of Mr. Morgan and Dr. Addison concur with many arguments to shew that in the case even of poisons acting as it is said by absorption, the result depends upon their operation upon the nervous supply of the inner coat, or lining membrane of the bloodvessels, a tissue highly susceptible of their action, and not upon their passing in the course of the circulation to the different organs.

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In many of these it is the disorder of the adipose tissue, which causes the mischief.

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There are states of the system very similar to that under Typhus, produced by various causes, which it may be worth while here to allude to. We see them in those diseases in which the products of Inflammation are thrown into the circulating mass, or in which there is an absorption probably of putrid animal matter, as Phlebitis, Inflammation of the Uterine Sinuses after Parturition, Puerperal fever, and the effects observed in cases in which portions of the placenta have been left in the uterus, in diseases arising from contagion and in those occurring epidemically rather than those occurring sporadically these we have before alluded to, as being often attended by a typhoid condition.

The effects of some animal poisons, such as those received during dissection, from the inspection of patients recently dead from Peritonitis, from the venomous serpents, resemble those produced by the poison of Typhus in the lesion of Innervation manifested, and the early requirement of support and stimuli. In surgery a group of symptoms is sometimes met with, bearing an alarming aspect, and arising from the confinement of pus, sometimes only in small quantity, in the theca of a tendon, or under a fascia. \* Another set occur in broken down habits and hard drinkers from a very slight cause of irritation, in such persons there is often the combination so difficult to treat of local inflammation, with constitutional symptoms of a typhoid character. I may mention also the collapse of the system produced by the sudden shock from severe accidents, such as injuries to an extensive surface from burns, lacerations, compound fractures, gunshot wounds, wounds and exposure of the larger joints, &c. in some local inflammations as Idiopathic Gastro Enteritis, & particular forms of infl<sup>n</sup>.

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Adipose Inflammation again assumes its influence here, & as some  
express themselves, Pancreatitis supervenes.

within the head, and Pneumonia in old persons, where the apex of the lung is involved, simulate Typhus. \* The occurrence of Gangrene, and the infiltration of urine might be alluded to also, and other local affections might be mentioned which give rise to the most <sup>severe</sup> constitutional irritation, as the acute Periostitis, ending in effusion of matter between the periosteum and Bone, or more particularly inflammation of the medullary membrane, or of the cancellated structure of the long bones, even when the smallest quantity of pus is produced. Such are the circumstances that have induced many, and particularly Surgeons to deny the existence of Typhus as a separate disease, sui generis, and to declare that there is no fever independent of, and not caused by Inflammation somewhere, or some local source of Irritation.

We were led before to the consideration of this opinion when considering describing the local affections, out of which the disease has been said to arise, and have shewn the fallacy of it, and after having traced the pathology step by step, there can now, in my judgement, remain no doubt as to the Fever being idiopathic.

Proceeding now to the consideration of the proximate cause of the disease, as far as we are enabled, — as it is conclusive that dissection has not yet discovered its seat, and that the morbid appearances hitherto observed are secondary to the Effects of prior changes not as yet appreciable by us (for organic alteration there must be, however slight, where there is alteration of function), in order to attempt a determination of the matter, it is necessary to ascertain accurately the earliest symptoms, to observe of what the primary and prominent phenomena of the

disease consist, and then apply physiology to the solution of the question. It is thus that the seat of other affections is presumed, where morbid anatomy fails us, as is the case more or less with Tetanus, Hydrophobia, Cholera, some forms of mania, Epilepsy & Hysteria which are referred to the Brain or Spinal Cord, as they are due to an alteration of their functions. And we should neglect one very important means of promoting a correct and comprehensive pathology, if we did not carry out to its fullest extent our physiological knowledge, and make it throw all the light it may be able to do, upon the signs and course of disease as made known to us only by observation.

Now it is clear as we have already seen, that the earliest symptoms consist of a collapse of the vital energies, and a derangement of the actions that belong to organic life: and that this alteration in the conservative functions, constitutes that deep affection of the entire organization which forms the striking character of Typhus and continues prominent until the resolution commences by a return of some of the healthy actions, as of secretion, excretion, &c.

But these functions are generally believ'd to be dependent upon the influence of the ganglionic system of nerves or the nervous system of Organic life as it has been called, and if the opinion be correct, it is upon this that we must believe the impression to be first made probably through the extensive <sup>surface</sup> ~~area~~ of the air cells of the lungs, exposed to the atmosphere and to all the poisonous exhalations it may convey.

An impression upon the filaments of the cerebro-spinal axis must fail altogether to explain the phenomena, as the nerves of this system

are mainly subservient to animal life, and do not controul the functions of circulation, absorption, nutrition, assimilation those in short of the whole capillary system, which are clearly disordered under fever, the symptoms manifested by such derangement constituting those of the febrile state a lesion must directly, but still secondarily, follow of the functions of that system on which the exciting cause is generally supposed to act - but the converse does not hold, for besides in the instance of the affections just alluded to, and other states, curious cases are on record, in which from injuries or disease of the head, all mind, sensation, locomotion, the consciousness of existence have been suspended for years whilst the circulation, respiration, nutrition, and the secretions have not been interfered with - Mr Henry Clinch by trephining the spot on a sailor's head, on which he had fallen from the mast more than a year before, restored him to his animal existence which had been lost ever since, the only sign of it left, being an occasional movement of the index ~~finger~~, finger, corresponding with the pulse, and this I believe when the body required nourishment - Andral has related a case of a boy in a similar condition, in whom there was only a nodding motion of the head, he died without having returned to consciousness, and at the inspection of his body, a singular induration of the surface of the brain was found, and a cyst in its interior. The intimate connection however that is established between the sympathetic system of nerves, and those from the ganglia must be borne in mind.

In so far, <sup>then</sup> as our physiology is well founded, as to the function of the sympathetic nerve, we must refer to it for the seat of fever, and the opinion will stand or fall with that on which it is based: the facts

nevertheless remaining the same as to the lesions in the organic functions being primarily, and all important in the disease & the effects thence arising are fully illustrated by its history and symptoms — thus at its invasion, the diminished energy of the circulation, of the respiration, and of the capillary action, as this is excited in some organs for secretion, in certain others for excretion, in all parts for nutrition, must be attended by the development of  $\frac{1}{2}$  animal heat, imperfect aeration of the blood, and retention in it of all the deleterious matters that are continually being thrown off in health — the function of deposition is clearly interfered with, whilst there is great reason to believe, that that of absorption is increased.

From the diminished action of the heart, as shown in the feeble and sometimes irregular pulse, already the balance of the circulation is lost, blood is not sent to the surface, and is congested in the interior of the body.

The brain, with all the other organs and tissues, is involved from these conditions, and gives evidence of it the earliest, for the reason intimated above, by a perverted performance of its functions of mind, sensation and voluntary power — according to the first symptoms we observe, or that are complained of, are chilliness, languor, and a sense of fatigue and weariness, inaptitude to exertion either of body or mind, loss of the different appetites, uneasy feelings about the body, as dull pain in the head and in the loins, aching pains in the limbs, and referred to the bones &c.

When reaction takes place, and the respiration is quickened with the circulation, there is a morbid development of animal heat, its excess is not carried off by exhalations from the skin and pulmonary mucous membrane

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Blood is again sent to the surface and the capillaries are congested, hence the suffusion of the eyes and the flushed face, the countenance is expressive in a manner that is diagnostic of distress and anxiety. The muscular power is greatly lessened, so that the position is rather passive than active, the intellect is more impaired, or the mind wanders, as deleterious particles continue to be carried into the blood, whilst there is deficient elimination, from this, and from other causes, it becomes more and more deteriorated, and the secretions from it are depraved, the lesions that occur specifically, and the congestions and inflammations of different organs take place; these and other results we have already entered into fully and it is unnecessary to retrace our steps farther.

This view of the proximate cause of Fever appeared to me so obvious a few years since, that I introduced it for discussion before the physical society of Guys Hospital, and I was not aware before I had, originated the above remarks that Dr Copland had also formed the same ideas, and had then published it in the 3<sup>rd</sup> part of the Dictionary of Practical Medicine. Through the extensive circulation of that work the theory is now no longer new.

It should be remarked that as yet no observations to corroborate it have been afforded by Pathological anatomy. It is clear that it must be extended to a number of other diseases, and particularly to those which we have shown Typhus to be allied, and to all the forms of secondary fever. In short we must say that local inflammations, and causes arising within the body may give rise to an irritation of the ganglionic system, and in a varied manner, as well as agents acting from without, it might

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appear too speculative to enter into these views, and it is beyond my present purpose.

Such however are beginning to be general, and especially in respect to the operation of poisons &c. Bouillaud has applied this view to intermittent fever, and has proclaimed it before the publication of his book, that no one may claim the priority, or be in the field before him. He says that ague is a neurosis of the great sympathetic & Andral in his "Cours de pathologie interne" at present coming out in numbers, notices the prevalence of opinions as to this system of nerves being the seat, or being connected with a variety of affections and affirms that he has not met with morbid appearances to establish them.

Frederick Charles Jones  
of  
London.

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April 18<sup>th</sup> 1838.