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Enteric fever

A slight sketch introductory to the
Relation of Two Cases
exhibiting some peculiar features
of this Disease.

A THESIS

by

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Enteric Fever

In the centuries of the Past there occurred a malignant disease of the nature of a fever, rapid in its spread and fatal to thousands. Whatever its other causation, it clearly commenced where men were herded together without sufficient ventilation, without proper food, and lacking in the habits of cleanliness. Springing from such conditions it was known by the varying names of Camp fever, Jail fever, Ship fever, Military fever. But not content with putting an end to existences already wretched, not satisfied with celebrating its victory over such victims, elated as it were by its triumphs, it threw itself upon those of the richer class and spared neither learned men nor noble lords. From this evil tendency it obtained its name of Contagious or Epidemic fever.

Useless indeed were the bunches of herbs laid underneath the august words of the learned Judges, for, let there be but some poor wretch dragged before them suffering from Jail fever, it laughed at such precautions and laid its stupifying grasp upon judge and sheriff and juryman alike.

Marking its victims with a characteristic rose rash it was known as the Spotted fever; signifying its fatal intention by darkening the spots it was known as *febris petechialis*; manifesting its malignant nature by rotting away the very bodies of its victims whilst still alive, it was known as

Putrid fever; and monifiably dulling their senses to the perception of their misery, yet goading them on to acts of madness, it was known as Brain fever.

Every where in the forefront of the Battle with Death our brethren in these past ages were not backward in meeting this terrible foe. Not only often defeated but also, themselves falling victims, they fought on with a determination characteristic of our noble profession from the earliest ages, and as they continued to look this foe in the face some, more clear-sighted than others, began to discern and discriminate different faces amidst the dust of battle. To discern first - for did not Gilchrist of Dumfriess in 1734 describe what he called "slow nervous fever," - and then discriminate, for Huxham in 1738 distinguished this from "putrid malignant fever." And so the work of discerning, of making careful observations, of noting matters of apparently no importance, went on side by side with the work of discriminating, of explaining the presence or absence of such unimportant - as was thought then - things as inflammation and ulceration in the intestines, till at last Dr. A.P. Stewart from observations made in Glasgow and Paris (1836-39) concluded that the differences between the two diseases were "so marked as to defy misconception, and to enable the observer to form with the utmost precision the diagnosis of the nature of the disease and the lesions to be revealed by dissection."

So also in 1843 did Dr. Henderson of Edinburgh finally

discriminate Relapsing fever from Typhus.

Unfortunately whilst the light was beginning to glimmer Brustonzeau of Tours observed this fact, that the inflammatory process, where it existed, was specially localised in the solitary and aggregated follicles of the Ileum, and upon this endeavoured to introduce the clumsy name of "Dothiένεντέριε" (δοθίη, a pustule; έντέρον, intestine). Too clumsy to succeed, it succeeded only in paving the way for the name coined by Louis "Fièvre Typhoïde (Τύφος είδος, like Typhus). A name alas, too popular, for it retarded the work of discrimination. Its very popularity showed that the light was but darkness in very many minds, a darkness which almost resisted the light which JENNER brought to bear upon the question from his observations made at the London Hospital in 1849-51. Dr. Murclison proposed the name Tythogenic fever but this met with little support.

The name which has been proposed by many, "Enteric fever" or "Enterica", is by far the more preferable one, yet "Typhoid" has charms for the people which prevent it sinking into the decent oblivion it deserves.

It is of this Enteric fever I propose to write - to write not fully nor exhaustively but rather introductory to the consideration of two cases which occurred in my practice in the West of London; cases in which it was difficult to distinguish this Enteric fever, which seems to delight itself in hiding under the mask of other diseases, from concomitant and simul-

ated forms of Disease.

Synonyms ~ Infantile Remittent ~ Infantile
 Hectic ~ Gastric ~ Acute Mesenteric ~
 Nervous ~ Slow Nervous ~ Entero-
 mesenteric ~ Intestinal ~ Typhus
 abdominalis ~ Ileo-Typhus.

Definition ~ An acute infectious disease due to a
 specific cause, and characterised by an
 inflammatory affection of the aggregated and
 solitary glands of the intestine, gastro-intest-
 inal disturbance, and escaping eruption of
 isolated, slightly elevated, rose coloured spots,
 disappearing on pressure and developing in
 successive crops.

Etiology ~ All effects have their causes. The
 presence of the effect proves the existence
 of the cause; but on the forehead of the
 effect is not always written the name of
 the cause. Especially is this the case where
 effects of magnitude and importance spring from minute
 and insignificant causes. Enteric fever is always
 a grave and oftentimes a disastrous disease. To what
 is this disease due? To the entrance into a susceptible
 organism of a specific infecting principle; and this
 specific infecting principle, a Bacillus. In other
 words Enteric fever is the consequence; of
 which the entrance into a susceptible organism of
 a short and slender rod with rounded ends (its length
 - three times its breadth - measuring only a third part of

The diameter of a red blood corpuscle) is the cause. Numerous observers found bacilli in Peyer's patches, the mesenteric glands and the spleen in cases of this disease, and to an organism very constantly present, EBERTH gave the name "bacillus typhosus": but a species described by KOCH and studied carefully by GAFFKY² appears to be the one which is found in all cases of this disease, and, at the same time, is not known to occur under other circumstances. Gaffky found this organism in the mesenteric glands, liver, spleen and kidneys of 26 in a series of 28 cases of Enteric fever which he investigated. He did not detect the presence of the bacillus in the blood or intestinal contents. Pfeiffer³ however claims to have discovered them in the intestinal contents and faecal discharges.

These bacilli can be grown outside the body, and under proper conditions their growth is very characteristic.

For instance the following is the description of a potato culture, —

"For some days after the inoculation it would seem as if nothing had grown — at most that the surface of the potato round the inoculating scratches had a moist shimmer; in the whole circumference of this shimmer a very thick resting turf of bacilli is present. But this peculiarity of behaviour is not always manifest, for upon some potatoes it is not visible. Only that culture in which it is visible is demonstrative."¹

¹ "Mitt.-a.-d. Kaiserl. Gesund.-Amt." Bd. II, 1884.

² "Deutsche Medicin. Wochenschr." No. 29, 1885.

³ "Virchow's Medical Diagnosis" p. 605.

Philipowicz^T was the first to demonstrate by culture the existence of the bacillus in the blood of patients. He obtained blood from the spleen by capillary puncture and succeeded in cultivating the bacillus from it.

Nerhauss^U in the same way demonstrated the presence of the bacillus in blood drawn from the points of the eruption in nine cases out of fifteen.

Wyssokowitsch^U made a series of important cultures. Injecting pure cultures of the typhoid bacillus into the veins of a rabbit, he killed the animal eighteen hours after and investigated the distribution of the bacilli by means of plate cultures upon gelatine.

The plates inoculated with blood from the heart remained sterile: those inoculated with blood from the liver produced 12 colonies: those inoculated from the marrow of the bone produced 200 colonies: and the inoculations made with blood from the spleen produced 240 colonies.

Does not this point to the fact that the germ of Enteric Fever has its predilection for certain organs of the body, just as Sir T. Grainger Stewart^U showed was the case with the germ of Influenza.

Taking up its abode in these different organs of the body how then does the typhoid bacillus produce the general symptoms of the disease? Precisely, I believe, as the same eminent observer showed was the modus operandi of the Influenza germ.

T. "Über diagnostische Verwertung der Milzpunction bei Typhus abdominalis," *Wien. Med. Blatt*, 1886.

U. "Nachweis der Typhus-bacillen am Leben." *Berl. Klin. Wochenschr.*, 1886.

1. "Über die Schicksale der im Blut injicirten Mikro-organismen im Körper der Warmbl." *Zeit. f. Hyg.*, 1886.

2. "Address in Medicine," *British Medical Association*, Bristol, 1894.

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For have not the discoveries of Hoffa, Brieger, Vaughan and others, made it clear that the link between the general symptoms of a disease and its specific cause is the definite chemical poison formed by the germ.

Thus in 1887, Vaughan and Novy obtained from pure cultures of the typhoid bacillus (obtained from a drinking water supplied to many who developed the disease) a syrupy extract which injected under the skin in cats produced a rise in temperature of from 2° to 4° F.

Sirotonin, Beumer and Peiper record the same results with this additional fact that the severity of the symptoms varied in proportion to the amount of material injected.

Consequently Vaughan and Novy suggest as a definition for such diseases the following:-

"An infectious disease arises when a special pathogenic micro-organism, having gained admittance to the body, and having found the conditions favourable, grows & multiplies, and in so doing elaborates a chemical poison which induces its characteristic effects."

Only one point remains to be dealt with, and it is the question which arises naturally out of the foregoing. It is this, How does "the special pathogenic micro-organism" of Enteric fever obtain admittance to the human body?

Eliminated from the bodies of those suffering from Enteric fever by the faecal discharges the micro-organism retains its activity under favourable circum-

11. "Die Natur des Milzbrandgiftes," Wiesbaden, 1886. 12. "Über Ptomaine," Berl. 1885-6.

13. "Ptomaines and Leucomaines," 1888. 14. "Zeitschr. f. Hygiene" I. 15. "Zeit. f. Hyg. I."

stances for an indefinite period; nor do changes of temperature appear to affect its vitality for Prudden^d found it capable of growth after having been frozen in ice for 103 days. He found also that it was able to endure a temperature of F. 132.8° ; and after alternate freezing and thawing it was as much alive as ever.

Such being the case it is easy to see how the following, once contaminated, act as the means by which the micro-organism obtains an introduction to a medium suitable for its growth and life-works.

(1) Water

Many illustrative cases might be cited in support of this but I will only relate three given by Dr Cayley.

1. At New Daven the water pipes were leaky and the soil through which they passed was soaked at one spot by the sewage from the particular house. No harm resulted until a young lady with the fever was brought to this house from a distant place; within three weeks of her arrival the disease broke out and 1500 persons were attacked.
2. At Calne a laundress occupied the middle one of three houses supplied from one well, into which the slops of her house leaked. She received the linen soiled by the discharges of a case of typhoid fever, and after fourteen days cases occurred in all those houses.
3. At Nunney a number of houses got their water supply from a foul brook contaminated by the leakage of the cess-pool of one of the houses, but no fever showed itself until a man with the fever came into that house from a distance. Then in about a fortnight it appeared in all the houses.

Now in a similar outbreak at Iron Mountain, Michigan, Vaughan and Novy^d demonstrated by means of potato cultures and physiological experiment the presence of the typhoid bacillus in the drinking water.

Ice Creams, if they are merely contaminated water presented in a frozen condition, will introduce into the system of the unfortunate consumer this active bacillus as surely as if he had imbibed him in a refreshing glass of water, or in a nourishing glass of milk.

Oysters, as Sir W. Broadbent^d has suggested, may, if fattened in places contaminated by infected sewage, convey the disease, simply, I should imagine, through the water contained within the shell.

② Milk

The first epidemic that was traced to such an origin occurred in Islington in 1870. It was investigated by Dr. Ballard. Between July 3rd and September 10th the occupants of six or seven houses were attacked, 167 individuals, of whom 25 died. It was a most remarkable circumstance that the district affected was included in a semi-circle, with a radius of a quarter of a mile, drawn immediately on the north side of the line of the North London Railway from a centre almost upon this line. There was no fever in the area contained in a corresponding semi-circle south of the railway, which here passes through a cutting. This, of course, at once suggested that human intercourse was in some way concerned in spreading the disease. The next clue was first hit upon by a lady, whose family was attacked;

2. "Medical News," 1888.

D. "British Medical Journal," 1895, vol. 1.

Dreschfeld. B.M.J. 1895, vol. 1, p. 869 - in addition to mentioning cases which arose from the ingestion of systems contaminated water, these might convey the fever by being washed out after and

and a little inquiry convinced Dr. Ballard that, far-fetched as such an idea had appeared, there was much probability in it. The milk-vender whose milk was suspected had himself fallen a victim to the epidemic, but his father, greatly to his credit, readily consented when applied to to give a list of the customers. It was then found that the dairy supplied 142 families, a very small proportion of those who lived within the semicircle. In no less than 70 among the 142 families there had been cases of enteric fever. The way in which the disease picked out the customers of the dairy in particular streets and rows was most striking. As might have been expected, women and children were attacked in much larger numbers than men, who drink comparatively little milk. The source of infection was traced to the water of an underground tank in the cowyard. When this was cleaned out, the wood-work in one corner of it was found to have broken away, leaving a gap, from which a rat-burrow passed into two old drains. Sewer-gas had no doubt entered the tank along this channel, and it is quite possible that liquid sewage had taken the same course a few months before the outbreak when the ground had been disturbed to lay a drain-pipe for some neighbouring houses. It could not be ascertained that water from the tank had ever been used to dilute milk, but the pails were washed out with it, and some of it might have been left in one of them by accident.

Now the researches of Seitz[§], and Wolfhügel and Riedel[§] prove that the typhoid bacillus grows freely in milk.

§ "Fagge's Princip. and Pract. of Medicine = RyE-Smith. Vol. 1. pp. 196, 197.

§ "Archiv. f. Hygiene, VII.

§ "Arbeiten aus dem Kaiserl. Gesund. zu Berlin, 1886.

Let then a large quantity of milk be contaminated by the smallest possible quantity of infected water, the merest film left on the inside after rinsing the cans, and you have an excellent medium for the multiplication of the germ and its distribution far and wide.

③ Air

That the micro-organism may under certain easily imagined circumstances float in the atmosphere and so find its way into the body through the respiratory organs cannot be denied. Some observers believe that the period of incubation is shorter under such circumstances.

INCUBATION

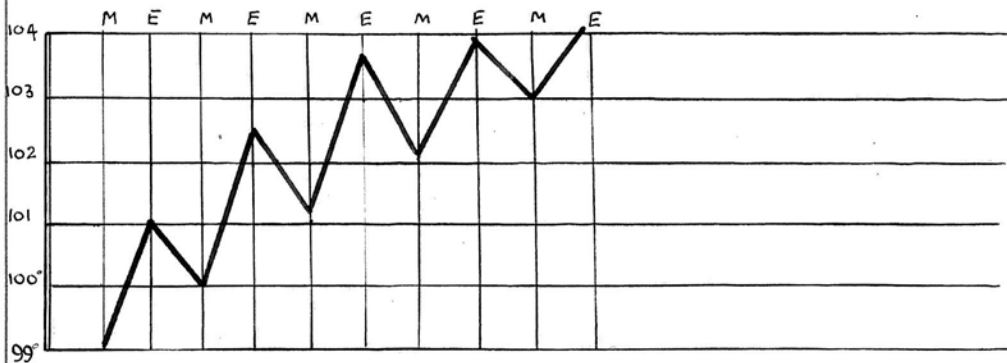
The period of time which elapses between the introduction of the bacillus into the system and the manifestation of the symptoms varies. The cases already cited point to this period being about a fortnight. Some observers give instances which point to the period being as short as 2 to 3 days and as long as 3 weeks.

SYMPTOMS

The commencement of enteric fever is generally slow and insidious. The patient comes to you complaining of depression and weariness; to him life is not worth living and day by day this feeling is intensified.

Headache, giddiness, disturbed nights, pains in the back and limbs, loss of appetite, dryness of the mouth and throat, lift their ugly heads above the dead sea of this depression, and combined with a very high condition of his bowels

cause him to come to the conclusion that he is bilious. Upon this he administers to himself an appropriate remedy which succeeds only too well in opening his bowels, for they remain relaxed. Thus he may come to you, and if he does so in the middle of the day his temperature may be normal and his own diagnosis appear correct. However the train of events moves steadily on, he becomes feverish and remains at home. The thermometer now indicates a regular irregular rise in Temperature as represented in the Chart below.



A chart which follows pretty much Wunderlich's rule. He says that the temperature during the first few days rises in a zig-zag fashion: from morning to evening there is an ascent of 3°F , from evening to morning there is a descent of 1°F .

Unfortunately in this disease there is no symptom which appears with certainty, and too often the temperature curve proves a broken reed, as will be seen in one of the illustrative cases appended.

With the flight of time the patient grows weaker, his mental faculties are blunted, and slowly he sinks into a condition of dullness interspersed by periods of active delirium.

His aspect is one of languor and weakness: his face is pale, the pallor heightened by a circumscribed flush on zitter cheeks: his pulse varies in rapidity and is soft with a marked diastole: if his breathing is quickened in the same ratio as the pulse, hypostatic congestion of the lungs has set in, otherwise it is quiet and regular—perhaps a little quicker than usual. His skin may be dry or moist, profuse perspirations occurring sometimes in the night, and at the end of the second and during the third week crops of sudamina frequently appear.

The most important point is the occurrence of the rose-rash. Its appearance clinches the diagnosis, the non-appearance does not unsettle it. The spots appear between the 5th and 20th day counting from the beginning of the symptoms. The regions in which they generally make their appearance are the lower part of the chest, the front and side of the abdomen, and the back: in some instances they have come out all over the body, and I have seen them only on the back, or not at all. Their colour is pink or rose-red, and disappears on pressure and at death.

Not only are they visible they are tangible, the finger detecting them as rounded smooth papules.

What distinguishes them from pimples? Their appearance in crops; the existence of the rash for two or three weeks being maintained by a succession of spots which appear and blush and fade within the limits of a few hours or, at the most, days.

His tongue, at first slightly furred with a bright red tip and margins, gradually clears until at the end of the second week it is of a vivid red colour, and smooth as though glazed.

If his bowels are loose the evacuations assume a bright yellow colour which is probably not seen in any other general disease. Pressure in the right iliac fossa produces a gurgling sound. The abdomen during the second week becomes rounded from distension of the bowels with gas, increasing it may end in an exaggerated condition known by name as METEORISM and by import as grave.

The spleen, becoming enlarged during the first week, by the end of the second week may be two or three times its normal size.

Headache is sometimes acute and as it passes off nervous tremors set in with sometimes sudden and violent delirium.

Towards the end of the third week the temperature begins to fall with the pulse rate remaining high. Now the patient complains of extreme weakness and of the impossibility of finding a comfortable resting place for his wasted body and attenuated limbs. Thus commences a convalescence which to all concerned is both tedious and slow.

In this brief sketch there has been no attempt made to note the innumerable variations which occur in the symptoms of this disease. It has been written with a favourable case before my eye yet before

I am finished I shall have described a case presenting the utmost variation from the norm and ending fatally, thus rendering the diagnosis capable of verification.

COMPLICATIONS- The complications observed in this disease are serious and numerous.

① Hæmorrhage from the bowels -

Ulcerated - sometimes severely so - as the bowels are, this complication occurs frequently.

Suddenly the sufferer feels that his bowels must move and calls for the bed-pan. A copious motion ensues but a dull faintness and a dead exhaustion creeps over the patient while a cold sweat breaks out on his forehead. The bed-pan being withdrawn is found to contain a quantity of fluid or partially clotted blood. The loss of blood may be so great that before the physician reaches the bedside life has fled. Having had no such unpleasant experience I do not look upon hæmorrhage confined within the limits of moderation as an unmixed evil for in a case which seemed to be going altogether wrong from hyper-pyrexia two copious hæmorrhages changed the complexion of affairs and from that moment the patient made a steady recovery without another bad symptom. Perhaps however the anxiety it causes outweighs the satisfaction felt when a

previously high temperature is reduced to normal and retained there for 24. hours.

Instead of being copious the haemorrhage may be only an oozing which does no more than darken the bright yellow of the stools.

(2) Perforation and Peritonitis -

Not only may the ulcerative process produce haemorrhage by penetrating an artery, it may produce Peritonitis by perforating the bowel either actually or practically.

Perforation may arise from,

- I. The sloughing process in a Peyer's patch extending throughout the whole thickness of the intestinal wall.
- II. Laceration caused by disturbance of the bowels during defaecation, vomiting, etc.
- III. Irritation by solid faecal material.
- IV. Pressure by pent up gas
- V. The ingestion of improper food.

Peritonitis may also be set up by the inflammatory action penetrating from the mucous surface to the serous covering of the bowels without actual perforation.

Embolism, Suppurative nephritis, Bronchitis, Catarrhal Pneumonia, Congestion of the Lungs, Pleurisy, Meningitis, Parotitis, Necrosis of various portions of the different tissues which compose the Body, and other maladies may occur to

Endanger the patient's life, and to hinder his recovery.
As an illustration of a rare form of Complic-
-ation I would narrate the following case which
occurred in my own practice.

H.N.

a healthy well developed male
aged about 35 years came to me
on the 30th Sep^r, 1892, complaining
of depression, lassitude and a feeling of biliousness.

His temperature carefully taken was found to be
normal. He was seen again on the 2nd of October
in the afternoon. His symptoms were much the
same and his temperature was still normal. He

however stated, in answer to a question put to
him, that he had felt feverish in the night
and that in the morning his mouth was
parched and dry.

On the 4th Oct: his wife sent
for me as she did not think him well enough
to go out, and, as he was persisting in affirm-
-ing the contrary, she wished me to decide
the matter.

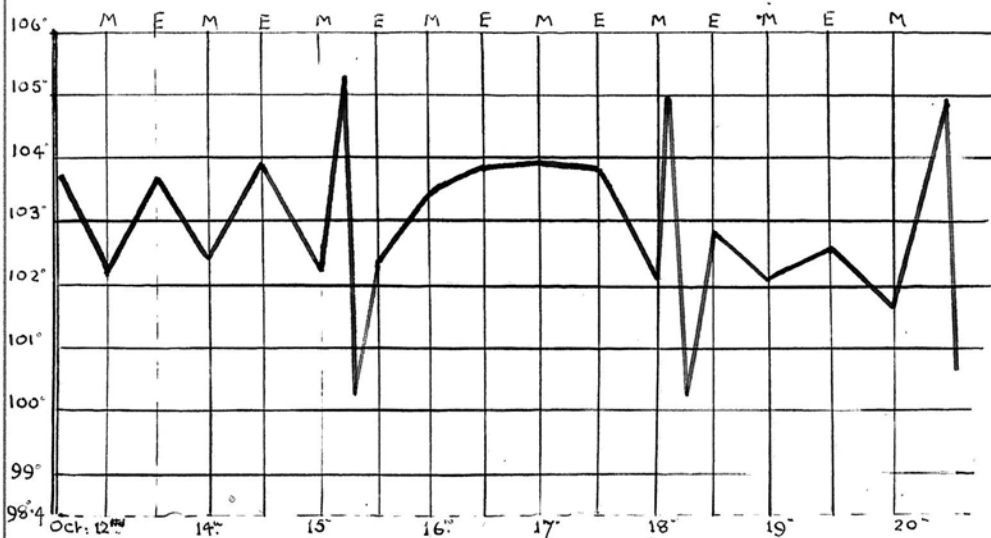
His temperature was now nearly
103° F. I, suspecting enteric fever, sent him to
bed; and on the 8th Dr. P. H. Pye-Smith saw him
with me and confirmed my diagnosis.

The disease ran an uneventful course until
the 15th when at noon a severe rigor occurred,
and the patient felt as if he were going to die. I
was sent for at once the nurse meanwhile giving
the patient Grs. XX of Antipyrin for the temper-
-ature began to rise rapidly. On my arrival I

found my patient in a stupor with a temperature of 105°F . and still rising in spite of the Antipyrin.

Rapidly he was rubbed all over with lumps of ice with the fortunate result of an equally rapid fall in temperature and recovery from stupor.

The temperature curve was now altered, and

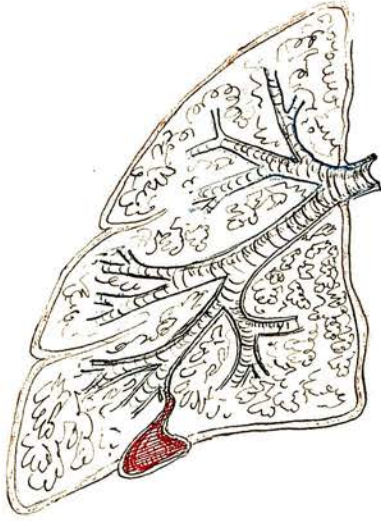


a slight cough began but no mischief could be detected in the lungs. Occasionally rigors occurred, the temperature rising rapidly, the pulse becoming uncountable, and the patient falling into a state of stupor. On the 25th the patient coughed up some greyish shreddy looking material and then all at once a quantity of intensely offensive green pus. Apparently an abscess had formed, destroyed a portion of the lung by pressure, forced its way into a bronchus, and thus found vent.

This was also Dr. Pye-Smith's opinion, although neither gas could detect any physical sign pointing either to the site of the abscess or to the course which it had taken. From the fact

That running on to the left side always caused cough and expectoration we inferred that the abscess was situated in connection with the right lung. As the case went on the typhoid symptoms subsided and the septic symptoms became more manifest, and even threatened the patient's life. Thinking that, if the abscess cavity were discovered, tapped and washed out, the patient's life might be saved I asked my friend Mr John Langton to see the patient. Accordingly on the 20th November, Sir Dyce Duckworth, Mr Langton, Mr Willett and myself met in consultation. Sir Dyce having, like Dr Pye-Smith and myself, failed to locate the abscess the surgeons attempted to do so by piercing the lung from front to back and from back to front with hollow needles connected with a vacuum chamber but with no better success. Medicine had failed, Surgery had failed, the *Vis medicatrix Naturae* — what could it do? To give it a chance to answer the question I removed the patient to S. Leonard's-on-Sea, with the result that an immediate change took place in all the symptoms and in two month's time the quondam sufferer resumed his arduous professional duties with his usual ability and success.

We all agreed that diagrammatically the abscess cavity might be represented thus:—



Owing to its position it would gradually fill and yet never be completely emptied, thus existing as a source of septic trouble.

Having illustrated a complication rare in its occurrence and rarer still in its happy termination, I proceed now to the less agreeable task of illustrating the difficulty of forming a correct diagnosis in some cases of enteric fever.

H.P. was a literary man of some eminence and of 42 years of age. On the 8th of Dec: 1893., at the request of his friends he was given into my care by Dr. W— with the following history: "In June last H.P. contracted syphilis. He was treated by mercurial subcutaneous injections, and later on by innunction, until all symptoms seemed to have completely disappeared. About the 25th Nov: he returned from Scotland where he had been residing with a medical man, who had superintended the treatment. Soon after his

Return he came to me complaining of feeling shivery and finding his temperature raised I sent him to bed. The temperature is slowly falling and I hand him over to your care as a case of "Influenza recovering."

On examining the patient I found him suffering from severe headache which caused the patient great anxiety. It was this symptom which caused his transference to my care.

The temperature was $101.6^{\circ} F$. On the 11th the temperature was normal. As the headache resisted all treatment and as slight delirium made its appearance Dr. Pye-Smith saw the patient on the 12th with me, when no rise of temperature was detected. He pronounced the case one of MENINGITIS following Syphilis and Influenza. The next day the temperature began to rise irregularly and when, on the 17th, Dr. S. Gee saw him with me he was of opinion that the case might be one of MENINGITIS or ENTERIC FEVER.

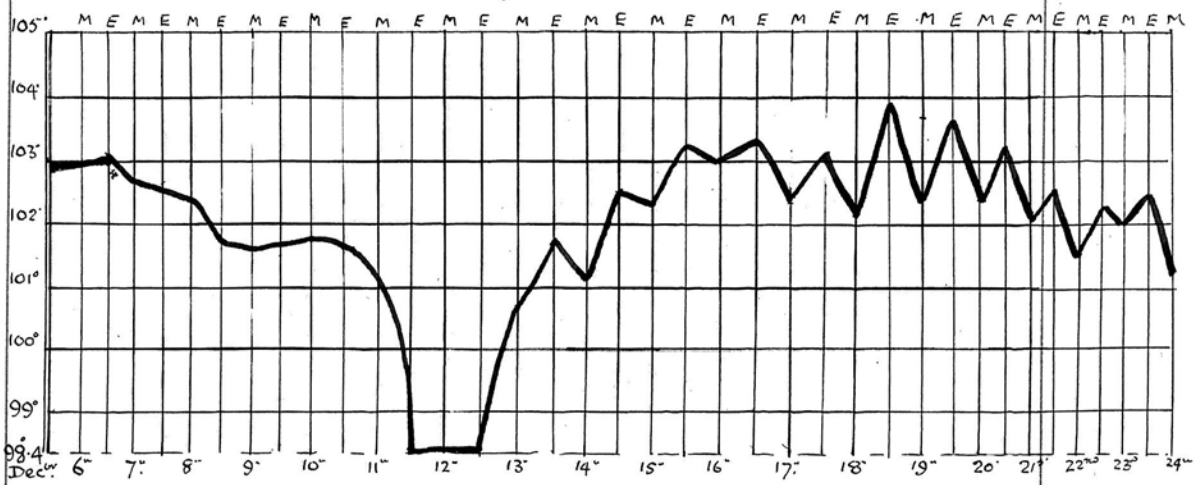
On the 19th we had a conference of all the medical men who had been connected by the patient since June together with Dr. Pye-Smith, Dr. Gee and myself. We numbered eight all told. The diagnosis arrived at on that occasion was "The patient is suffering from Enteric fever."

The friends did not seem to have much

Confidence in a diagnosis arrived at with so much difficulty and representing the united wisdom of so many members of the medical faculty, for on the poor patient's demise, on the 24th, - they desired an autopsy which revealed that, on this occasion at least, in the multitude of counsellors there is wisdom.

It was a peculiar case.

1st The temperature was peculiar.



Many explanations have been given of the fall on the 11th and 12th. To the most probable one, that this was the commencement of a Relapse, the autopsy reveals a negative.

Not more, according to the autopsy the day of the month coincided very nearly with the day of the disease, but when we consult the chart we find that the temperature not only falls to normal on the eleventh day of the disease, it has been falling gradually during the four days preceding. A very peculiar temperature curve for the second week of Enteric fever!

2nd. The headache was peculiar.

Not its presence but its persistence. Jenner insisted that it was a very important point in the distinguishing between the headache of Enterica and the headache of meningitis, that the headache in Enterica ceases before the delirium begins.

In this case the headache and the delirium were co-existent.

3rd Many of the characteristics of enteric fever were absent.

1. The yellow colour of the stools
2. The rose-rash.
3. The enlargement of the spleen.

4th Although he had been mercurialized to the extent of showing a faint line in his gums yet a few days before his death mucous tubercles appeared around his anus.

5th There were present, especially a few days before death, convulsive spasmodic movements of the upper and lower limbs particularly on the right side. In the early days of the disease the tache cérébrale could easily be obtained, and the pupils were contracted.

After all it remained for the autopsy to lay all doubts as to the nature of the complaint to rest for ever, and it did so by revealing the characteristic lesion of enteric fever.

To a short description of this lesion I would devote a few lines under the heading of

Pathological Anatomy

No other acute specific disease is accompanied by such internal changes. Whatever doubts, whatever difficulties beset the diagnosis during life let there be but one glance into the interior of the intestines after death — would it were possible during life, — if will clear all up. A moment's vision of this characteristic lesion will be worth far more than many hours of anxious pondering.

This lesion is a series of changes which take place in the solitary and agminate glands of the small and large intestine. These changes are always progressively more advanced in the lower part of the ileum, reaching their full development in the neighbourhood of the ilio-cæcal valve.

Stage 1.

The earliest change observed in these glands is swelling with hyperæmia around. The solitary follicles affected project like shot above the surface of the mucous membrane: the projections varying in diameter from $\frac{3}{8}$ to $\frac{1}{4}$ of an inch.

The Peyer's patches project in the form of flattened oval plaques with reticulated surfaces and raised margins.

This change attains its maximum about the end of the First Week.

Stage 2.

The next change is one which often follows elsewhere.

The infiltrated lymphatic tissue undergoes necrosis. The mass changes to a dirty yellow colour and becomes more opaque, and sloughing ensues.

When this occurs in the case of the solitary follicles small ulcers remain, whilst in the case of the Peyer's patches the ulcers are larger, oval in shape, their long axis running in the direction of the bowel. Not that the slough separates all at once. The process of separation occupies the **Second WEEK**, during which the slough, stained by the intestinal contents a deep yellow colour, is cast off either in a single piece or in fragments.

Stage 3.

The ulcer thus formed has a smooth floor and abrupt, somewhat overhanging margins. For the bevelled margins belonging to tubercular ulcers are not seen here.

The depth of the ulcer varies. It may be but superficial, or it may involve the whole of the Peyer's patch. Its floor may be formed by the muscular coat of the intestine, by the peritoneal covering thereof, or it may have no floor at all. It has perforated. Penetrating thus deeper and deeper it may ruin all the important structures, or it may in its course destroy a small artery and, by the ensuing hæmorrhage, life as well.

Cicatricization does not, in adults at any rate, begin until after the **Third WEEK**. When it does it probably requires two or three weeks

for its completion.

SIX WEEKS from the beginning of this disease before its characteristic lesion is no longer a source of danger. The healing process proceeds by way of granulation and by the restoration of the epithelium, but the lymphatic structures are destroyed for ever.

The resulting scar is thin, transparent and flexible and does not lead to narrowing of the bowel by puckering and constriction.

Where a Relapse occurs there is a renewal of the intestinal lesions which pass through the various changes recorded above.

TREATMENT

The name of the drugs recommended in the treatment of this disease is Legion. A sure sign that THE CURE still lies hidden in the womb of futurity.

To me, as doubtless to others, the Principles of the Treatment (garnished or ungarnished with drugs according to the taste of the practitioner) have seemed to be the following:—

1.

Think of others and prevent the spread of the disease by destroying the micro-organisms as they come from the patient. To this end disinfect the sputum^p, the faeces, the urine^p, and vomited materials.

2.

Keep the patient's temperature well in hand.

To keep the temperature down conduces to the comfort of the patient, & the preservation of his strength, but it also shows you what drug will act best in that particular case as a temperature reducer. To discover this in the beginning of a case is to have a comfort in the time of hyperpyrexia.

Then when drugs fail, as, alas, they often do in the time of your sorest need, lumps of ice, where with to rub your patient with, are always, or ought to be, at hand in a fever case. This mode of treating hyperpyrexia, easy in its simplicity, ready in its handiness, I have never found to fail.

3.

Avoid everything which would tend to extend the ulcerative process in the intestines.

Diarrhœa must be controlled, at the same time overloading of the bowels must be avoided.

If you get the disease in a very early stage start with a good dose of Calomel guarded by ten grains of Dover's powder. This clears the bowels once for all, and afterwards they can be cautiously relieved by small enemata. Fermentative changes in the bowels ought

to be prevented if possible, to preclude undue pressure of gas in the intestine.

This I have sought to do by the administration of Salol. Certainly it has succeeded in my hands in stopping the diarrhoea and in reducing the abdominal distension.

If Dr. MacLagan's hypothesis be correct and relapses are due to the re-infection of the system by the contents of the intestinal canal then, it seems to me, the choice must be made between a moderate diarrhoea or some method of disinfecting the contents of the *Prima Via*.

Salol is not decomposed in the stomach but is split up in the intestinal canal into salicylic acid and phenol compounds. From this may we not hope that the administration of this drug in 15 gr. doses every four hours will not only prevent undue fermentative changes taking place in the intestinal contents but will also have such an effect on the ulcerative processes that the healing of the raw surfaces is hastened and relapses prevented.

Movement by the patient bringing into play his muscles must be prevented as far as possible for it not only causes waste but endangers the continuity of a much thinned out intestinal wall, and the existence of a greatly enlarged and softened spleen.

The Quality and Quantity of the food administered must be strictly guarded.

The quality — for perforation has been distinctly traced to the ingestion of improper food. Fagge mentions two cases which occurred in Guy's Hospital, each at the end of the Sixth week. One patient was seized with pain shortly after eating two raw apples, the other while in the act of eating watercress.

The quantity — for the patient must not be overfed, for overfeeding means indigestion, distension, pain and vomiting. All of which not only distress and depress the patient but threaten his life through the ulcerated condition of his bowels.

Milk and milk foods administered in such a manner that the formation of large indigestible curds are avoided: meat ~~must be~~ given in the form of an essence or juice which preserves its nutritive value as well as its stimulant properties: water either plain or aerated, at the temperature of the room or iced freely supplied in small quantities; such form the staple of the patient's diet.

4.

Treat the various complications and symptoms as they arise.

Haemorrhage — in this serious symptom and complication I have found nothing so successful as Turpentine — 5minims in capsule every 10 minutes

Sleeplessness - this is apt to be a very troublesome symptom. It wears the patient, depresses his vital powers, and distresses his spirit.

In the early part of the fever Bromide of Ammonium with Chloral is likely to be most successful. Sulphonal, finely triturated with sugar and administered in a little milk, I have found a most successful soporific.

In the later stages of the disease nothing is so beneficial as Opium. Even when it has failed in the early part of the complaint I have seen it prove most beneficial in a later stage.

Somnolence is best met with stimulants - alcohol, Carbonate of ammonia, or ether.

Delirium may be controlled by small doses of alcohol and by the application of the ice-cap to the head.

Tremors call for Opium and alcohol; great nervous depression for Musis.

Thus all the various complications and symptoms, - numerous, unexpected, slight, severe, ringing the danger bell or appearing like a flash of lightning, tractable or intractable, must be looked for and must be met. They may call for medical skill or surgical interference, for the administration of drugs, the use of common sense or the employment of the sharp cutting knife. The result, the elation of success or the depression of defeat as after weeks

of anxious care in watching the patient, in directing the nurses, in arguing with the friends, the victim of the attentions of the typhoid bacillus either recovers or succumbs to the machinations of the foe.

Whether at any time a plan of treatment may be discovered which aborting this fever will prevent it (as it sometimes does spontaneously) running its full and frequently fatal course I cannot tell.

If ever this consummation so much to be desired is arrived at it will be accomplished, I am persuaded, not by destroying the genus of medicinal antiseptics, but by rendering the system incapable of supplying these germs with the material upon which they live and out of which they manufacture that deadly poison which has robbed many a home of its happiness and the world of many of its brightest ornaments.

That which causes one out of many exposed to its influence to succumb to its attack, that which we call susceptibility, is nothing more nor less, I believe, than the presence in the fluids of the body of some favouring condition or modifying principle which not only allows the germs to live but to flourish and, above all, to carry out their life work, - enteric fever we call it.

The success of the Antitoxin Treatment in Diphtheria, of the treatment of Pasteur in

Hydrophobia, and of the leader in the vanguard
 of all such brilliant modern discoveries, the
 practice of vaccination introduced by the noble Jenner,
 leads us to hope that before this century
 expires it will be crowned not only by the
 wrath of discovery, it already wears but by the
 wrath of victory, — victory over such a malign-
 ant, insidious and treacherous disease as that
 known by the name of **Enteric Fever.**

"Ave, Imperator! montui te salutant."

David Anderson-Berry,

M.B., and C.M. — 1884.

Fellow of the Royal Medical & Chirurgical
 Society of London,

Fellow of the Society of Antiquaries
 of Scotland.