A Thesis.
on
Enteric Fever.

by

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An account of Enteric Fever, its, Etiology, Pathology, Symptoms, & Treatment.

Definition.

A Continued specific fever, having an incubation period of about two weeks, Characterised by an inflamatory affection of the agminated & solitary glands of the intestines, Gastrointestinal disturbances, & a peculiar rash.

History.

It has been various described as Typhus Pretor, Nervous fever, Abdominal Typhus, Common Continued fever, Entero-Mesenteric fever, Follecular Enteritis, Bilious, & Gastric fever.

The continued fevers of which Enteric was one form, were at one time described under the single name of Common Continued Fever, of which it was believed there were several varieties, but since the year 1840, specific differences have been gradually becoming more & more aborious.

Formerly Typhus & Typhoid Fever were supposed to be identical. In 1804, Pinel of Paris on investigation of 150 cases of Parisian fever, found always inflamation, with or without ulceration of the mucous membrane of the intestine. In 1829, Louis first gave a connected view of the symptoms, & intestinal lesions, in the fever then common in Paris. Other observers finding that the lesion was absent in many cases where it was intentionally looked for, came to the conclusion, that there were in fact two diseases which were indifferently named Typhus, & Typhoid. Other physicians, English, Scotch, & American followed in the investigations. Opinions as to their true & separate distinction, were divided up till the year 1846, when Dr Jenner began investigations. He was the first to argue that the Material media by which they are propagated, are specific, & different from each other.

Since 1857, Proofs of difference have accumulated by observations of the late Dr Wm Budd of Clifton, Bristol,

The late Dr Burchison of St Thomas Hospital,
The late Professor Wunderlich of Leipsic,
Von, W, Soemmer of Zurich & others.

Etiology.

Enteric fever is a disease of world wide prevalence, occurring for the most part in an endemic form, but occasionally, assuming the proportions & behaviour of a genuine epidemic. In Europe, it occurs in Russia, Denmark, & Middle Europe, especially in England, France, Germany, & Holland.
It is most prevalent in the Autumn, during the months of August, September, October, & November. It is least prevalent, during February, March, April, & May.
Most epidemics occur after the summer, when the ground is driest to its greatest depths.
Others occur independently of time or dryness.
Its extent is usually limited to a town or part of one, perhaps to a single house, in which case it may be traced to the water or drainage. It mostly occurs in persons between the ages of 15 & 25; in men more than women, in the strong well nourished, & proportionately in the poor. It rarely occurs in Infants, & old people, in persons suffering from Cardiac, Tuberculous, or Carcinomatous disease, Acute or Chronic diseases, & in Pregnant

of nursing women.

"Dr Murchison's investigations show, that more than one half of the total number of cases admitted into the London Fever Hospital during 10 years, occurred in patients between the ages of 15 & 25. More than one fifth, in persons under 15. One tenth, in persons between 25 & 30., & from that age onwards, the numbers rapidly diminish." (Brietwe page 200).

Except in rare cases, one attack confers immunity. People may become less susceptible to it, by living in places liable to the disease as in Munich. It is doubtful, if it is contagious tho this has been strongly advocated by the late Dr Wm Budd of Bristol & others.

There are various theories as to its origin.

(1) From Decomposition of organic matter.

(2) "A specific virus, yielded by the bowels of Enteric Fever patients, & probably by them alone" (Brietwe P201.).

(3) "Miasmatic origin, rendered probable by cases occurring in places remote

from travel; & where there is no suspicion of Contagion. The probable explanation of this is, that the organism may originate, & develope not only in the body & dejecta; but outside of them also" (Meiemeyer P625).

(4) Some hold that it may be caused by milk from cows fed on soil, containing much sewage; or from eating the flesh of animals that have suffered from the disease. (Roberts P120).

The poison clings to the dejecta from patients; but it is doubtful if it can be communicated by emanations from the skin & lungs. The fresh dejections don't seem to spread the disease; & they probably undergo some fermentative change which renders the germs more active, after reaching some place favorable for their development; & they then re-enter the human body.

The poison probably enters by the alimentary canal; but Meiemeyer P625 says:
"Absorption takes place through the lungs generally; but several cases have been

caused by contaminated well water. It is doubtful if the person can be swallowed with decomposing meat."

In the army statistics, "the cavalry & horse artillery regiments have given an excess in some years, & (according to the sanitary commission), the reason assigned by medical officers for the difference, is connected with foul stables, & stable duties; & attention is drawn to the fact, that horses in these stables are liable to attacks of Enteric Fever. If the connection be justified, it opens up an hitherto unrecognised power of the disease, & is interesting in comparative pathology. It has an obvious bearing on all the mounted corps; & the recent in Egypt give an excess to these, with much sickness among the horses. The excess is not general, & some cases may be traced to other causes, as local of barracks." (Welch pg 5).

The Dejecta probably contain some virus, the power of which may last for long periods. As instances of this: —

Dr Cayley in his "Croonian" lectures says "Typhoid stools were burned in a dunghill. Some five weeks later, five persons who were employed in removing the dung from the heap, were attacked by Typhoid fever; their alvine discharges were buried deeply in the same heap; & nine months later, one of the men who were employed in the complete removal of the dung, was attacked & died."

"At Meanwee in India, five years had elapsed, between the shutting up of the old wells & cesspits, & the outbreak of the disease in the 85th Regiment, traced to well water contamination by them." (Welch "Enteric Fever" Page 187).

Pathology.

In the Early Stage. — There is little emaciation. Rigor Mortis well marked, general extensive hypostasis, sometimes bedsores, often gangrene, the teeth & gums may be covered with sordes, the blood in the heart & large vessels, is thick & dark, & sometimes contains coagula.

In the later Stage. — The blood is poor in Albumen, & corpuscles. There are always changes in the Respiratory System, such as, Laryngeal ulcers, Bronchial catarrh, Hypostatic congestion, Oedema, or collapse of the lungs, Lobar or Lobular, pneumonia. The Bronchial & Tracheal glands are often affected.

The Heart is usually relaxed, the endocardium, & lining membrane of the vessels infiltrated, red, & discoloured.

The Alimentary System. — The Pharynx & Oesophagus, may be congested, inflamed, or covered by a Diphtheritic deposit.

Sometimes there are superficial ulcerations.

The Stomach is generally normal; but its Mucous Membrane may be hyperaemic,

swollen, or superficially ulcerated.
The Intestines. Here are found the characteristic lesions of Enteric fever, affecting the solitary, & Peyers glands, & the Mesenteric glands in relation to them. The seat of the lesions, is in the lower third of the small intestine; their number & size, increasing towards the ileo-caecal valve, but they may extend much higher up, or lower down, in certain cases.
The following is Rokitanskys description of the changes which take place. He divides them into four stages.
First Stage. — The Mucous Membrane of the whole intestine is congested, & appears swollen, relaxed, cloudy & covered with mucus & epithelial masses. This is most marked in the lower part of the intestine. The Mesenteric glands are moderately swollen, soft, vascular, & dark coloured.

Stage of Typhus Infiltration. — The general redness & swelling of the mucous membrane is increased, & concentrated

around the Peyers & Solitary glands, in the lower part of the Ileum. The size of the Solitary glands varies, from a millet seed, to that of a pea.
The Peyers glands usually coalesce over the valve, & then often cover a strip of intestine, several inches long.
The cut surface, looks as if infiltrated with a soft, greyish white, or pale reddish encephaloid mass, called "Medullary infiltration". Sometimes also, the degeneration extends, & there is a Medullary infiltration of the connective tissue of the Mucous membrane in the vicinity, or a cellular neoplasm, arising from connective tissue corpuscles (Virchow).
The Mesenteric glands are the size of a bean, or hazel nut, greyish, red, in colour, & quite hard.

Third Stage. Stage of Relaxation, softening, & breaking down. The changes vary.
(1) Sometimes there is Resolution, slow, chiefly in Abortive typhus.

(2) Sometimes, the surface of the follicle is changed to a dry friable slough. (Yellow from the faeces). This sometimes extends over the whole gland, or only over parts.

(3) Sometimes, Peyers glands may rupture outwards, without their covering slopping, which in this case, looks full of holes, & netlike.

The Mesenteric glands are most swollen in this stage. Sometimes are the size of a hens egg. Their colour is generally bluish, or brownish red. Their substance has a peyrid red, medullary appearance.

Fourth Stage. — The slough is thrown off en masse, or in pieces; & leaves the Typhus ulcer. The ulcers are of course opposite the insertion of the mesentery. Their long diameter is with the length of the intestine. The margin is bluish red, later on, is slate coloured; the border of the mucous membrane is about a line in breadth, & is movable over the surface of the ulcer

The floor is formed of a delicate layer of sub mucous connective tissue, which covers the muscular coat.
When the slough is detatched, the mesenteric glands subside; but long remain larger, & more vascular than normal".
(Niemeyer Page 628).

It is doubtful if there is any previous hyperaemia. Murchison denies it.
The deposit consists chiefly of granular matter, oil globules, lymph corpuscles, & frequently giant cells formed probably in the glandular sacs, which burst into the surrounding cellular tissue, or there may be an increase of cells here also.
The date at which the deposit takes place is doubtful. Murchison says it has been seen on the first or second day. Trousseau gives the fourth or fifth day, as the time of its appearance.
The solitary glands are not always involved, & are more liable to be attacked in children. Sometimes they may be alone affected.

It has been stated above, that after the infiltration, there may be reabsorption. The glands may subside, due to the absorption of the contained matter.

"Dr Murchison considers that this reabsorption is what probably occurs in cases where the disease is mild, & of short duration. The cases which do not go on to ulceration or sloughing, & in which the whole of the presumed poison is absorbed into the blood, are always the shortest & the mildest.

Dr Friedrich of Dresden regards the elimination of the deposit from the Peyerian patches, in the Enteric fever of children, by the formation of sloughs, & ulceration, as extremely rare. (Aitken Page 89)

Dr Budd in his book on Typhoid fever, (Page 49) says, in reference to the changes in the intestine "When we remember that this affection is characteristic of the fever, that it stands in the same relation to it, as a diagnostic mark, at least as a peculiar ~~rash~~ pustular eruption to Small pox, that it is an affection which proceeding

from within, breaks out on the surface, that it results in the elimination of the morbid product; & lastly, that the product itself, is the one known specific product of a contagious fever, the evidence becomes irresistible, that we have here the essence of an eruptive process, whatever the name by which we choose to call it."

There are two forms of patches described, viz: "Plaques Molles", & "Plaques Dures" (Murchison) Both may exist at the same time, or there may be gradations between the two.

In "Le Plaques Molles", the deposit is less abundant & is confined to the glands, which in the Plaques Dures have burst, & discharged their contents.

The Depth of the ulcer may vary with the severity of the lesion, & may be bounded only by the peritoneal coat of the intestine. The ulcer has a punched out appearance.

Klebs has found Bacilli in the diseased patches of the intestine, & in the mesenteric glands. Koch confirms this statement.

In the sloughs of the intestinal ulcers, both long & short Bacilli have been seen

In the lymphatic glands, are the shortones. Short ones also were found in the vessels of various organs, especially, the spleen, kidneys, & liver. Probably they are the exciting cause of the disease. Baraglaini has found similar Bacilli in the blood of living Typhoid patients.

The above differs from the researches of Fischl & Eppinger, who detected micrococci. It is possible that there may settle in the Typhoid ulcers, by way of a secondary invasion." (Zeigler's "Pathological" Anatomy, Article 206).

Perforation may be caused by:

(1) Molecular disintegration, or extensive ulceration, producing one or more minute holes.

(2) More or less extensive sloughing, involving the peritoneum, the slough separating, & leaving an opening of variable size.

(3) Rupture, or laceration, causing an elongated perforation, which may even happen after cicatrization is complete.

(4) Mechanical violence, as by the use of injudicious food, vomiting &c.

Sometimes prior to the perforation, adhesions have taken place with the neighbouring organs, due to previous peritonitis.

The Healing of the Ulcers - The following is Rokitansky's description of what takes place. — The loose border of the Mucous Membrane forming the edge of the ulcer, becomes attached to its floor, gradually, from the periphery, to the centre. At the same time, it becomes pale & thinner. The delicate connective tissue covering the floor of the ulcer, becomes whitish, thickened, & finally transformed into a serous plate, into which the adherent border passes imperceptibly, thinning as it approaches the centre. The Mucous Membrane gradually extends over the plate, towards the centre of the ulcer; but at the same time, becomes thinner from tension. When the edges of the Mucous Membrane come together & adhere, healing is complete. From the thinning of the Mucous Membrane

the cicatrix forms a slight depression, often pigmented, smoother than the surrounding parts, & studded with a few tufts.
Cicatrization never causes stricture of the intestine. At the same time the mesenteric glands shrink, to firm, slate grey bodies; sometimes also they become caseous or calcareous" (Heimyer Page 681).
Sometimes, healing may be delayed; & the ulceration may extend into vessels causing haemorrhages; or there the peritoneum causing peritonitis.

The mesenteric glands are generally enlarged from the first; & the same increase takes place in their lymphatic elements, as in the intestinal glands.
They sometimes burst into the peritoneum.
The mesocolic glands are similarly enlarged, when the colon is affected.
Other glands may enlarge from irritation.

The spleen is generally enlarged, especially in young persons. It may be twice, or even six times its normal size.

It may contain opaque yellowish masses.
May be quite pulpy. Sometimes it ruptures.
As before stated, short Bacilli have been
seen in the blood of the spleen.

The Liver is sometimes congested, or softened.
The cells always become more or less granular, & this
is well marked in severe cases.
The Gall Bladder, may have a little catarrhal
inflamation. It may even contain ulcers.
The Bile after three weeks, is often thin, watery
& colourless; & has an acid reaction." (Roberts Page 124).
The Peritoneum. — There may be the remains of
peritonitis, & adhesions & extensive or circumscribed abscesses
It may be perforated in one or more places. There is
generally only one perforation; but may be two or three or
more, & they are generally situated in the lower part of the
ileum; but may be found lower down, or higher up, or
even in the large intestine.
The Kidneys: — Granular degeneration of the gland cells
occurs in various degrees, the organ is
sometimes congested; & may have the tubes
choked with detatched epithelium.
Hoffman says "The minute vessels are in a state
of extreme fatty degeneration." (Aitken Page 596)

The Bladder may be congested or inflamed.

The Blood — certainly undergoes a degeneration. Sometimes does not coagulate. As before mentioned, Bacilli have been found in it, both before & after death.
In some cases soon after the febrile onset, the white corpuscles were numerous, & often but smaller than normal. They were remarkably active; throwing out numerous Amœba-like projections, in all directions; & this acting lasted for at least three hours, after the blood was placed on the slide.
In the Liquor sanguinis were minute, but well defined, spherical, homogenous masses, as of Albumen; but showing no movements, even when kept for hours. In some instances too, the red corpuscles; for corpuscles not to be distinguished from red ones, when quiescent, showed a similar tendency, throwing out projections,

sometimes conical, sometimes, flaked shaped; & oftentimes very irregular in outline. With the movements of the Amoeba like processes, the corpuscles became thinned & lighter in colour; & then, several a spherical point or points; one to six in number, could be discerned in their interior, very similar to the free masses in the Liquor Sanguinis. The processes thrown out, did not carry any colouring matter with them! The movements lasted two hours. All the corpuscles did not show this activity. After the changes had continued for some time, it was difficult ~~red~~ to distinguish, red from white corpuscles" (Welch Page 149).

"It will be seen, that the essential lesions in Enteric Fever, all belong to, & involve, part of the lymphatic system. The glands involved, are in a state of inflamation, due to the irritation of some poison, absorbed from the bowel — the actual poison being usually swallowed with the ingesta — so that the more normally & actively the functions of the glands are performed, the more will they absorb the poison. Hence Enteric fever is most common in persons under thirty years of age.

Its straight involvement of the Peyer's patches, & the mesenteric glands, that the spleen, & system generally become infected; & acute intestinal catarrh & diarrhoea, either as the result of such contamination, or of the extension of inflamation to the glands of Lieberkühn, i.e. to the Mucous Membrane generally".

(Aitken Page 576).

Symptoms.

Enteric fever begins gradually & is often so insidious, that it is difficult to fix the date of its commencement; but it is sometimes more marked.

The premonitory symptoms may last for several days, or even for several weeks; & comprise, mental disquiet, indigestion, restless sleep disturbed by dreams, headache, dizziness, wandering rheumatic pains, & repeated epistaxis. There are usually several chills; but rarely shivering or clattering.

During the first week, the patient is often not confined to bed; but complains of headache, especially in the forehead, buzzings in the ears, flashes in the eyes, dizziness, & weariness, pains in the extremities. He is drowsy by day, & likes to sit over the fire; frequently he is wakeful, or dreams at night. He complains of irregular chills & flushes.

There is an increase of both the

temperature & pulse. The tongue is red or coated. The patient complains of great thirst, loss of appetite, & unpleasant tastes in the mouth. There may be vomiting, or diarrhea & abdominal pain. Niemeyer (Page 632) says, that "there is generally constipation; but sometimes diarrhea." Frequently however the diarrhea is one of the earliest symptoms. There is often repeated epistaxis. Sometimes there is some bronchial catarrh. The face, especially the cheeks appear red when the patient is lying down; but pale when he is sitting up.

If the tongue has a thick coat, (which is rare) this is generally detached from the point & sides first; or else from the middle, thus leaving a red line, which is often broader towards the tip, & looks triangular. The Abdomen is generally enlarged from the first, & pain is felt on pressure, generally all over the surface; but more distinctly in the

right illiac fossa, where we may detect "illeocæcal gurgling". As regards this gurgling, many hold that its presence for diagnostic purposes, is not unaccompanied with danger. Since it can be heard sometimes in health; & frequently in other conditions of disease, its value in a diagnostic point of view is small.

The Spleen becomes enlarged towards the end of the first week. It rarely projects beyond the ribs; & may be pressed upwards against the diaphragm or backwards against the spine. It may measure six inches by four; & be found to correspond to the 8th, 9th & 10th ribs. The diagnosis by percussion depends very much upon its position.

The Typhoid Spots may appear towards the end of the first week; rarely earlier than the 7th, or later than the 14th day. They are to be seen on the epigastrium

& surrounding parts of the Abdomen, chest, & back; & sometimes, but rarely, on the face & extremities. They are rose coloured, lenticular, rounded on the surface, are soft to the ~~feel~~ touch, & disappear on pressure. Their size varies from a half, to two & a half lines in diameter. They appear in successive crops, & are rarely numerous. There may be two or three, or even twelve, to twenty, at a time; but generally few. Each crop last for about two days, but sometimes, may remain for, from two, to five days.

The Urine is usually concentrated, high coloured, & has well marked febrile characteristics, with an increase of urea, & uric acid; & a decrease of Chloride of Sodium.

The Pulse during the first week, reaches 90, or 100, or more, beats per minute. Its frequency does not correspond with the temperature, since it is influenced by other causes: E.g.: It is increased 20 or 30 beats a minute if the patient sits up, or strains, or gets excited.
The Blood wave is usually large; but the artery feels soft during diastole; & we often find a second wave; hence a Double pulse, due probably to a subparalytic condition of the contractile elements of the arterial walls.

During the Second week, the pains in the head & limbs cease; but the dizziness & noises in the ears become worse; "due not to disturbed innervation, but to propagation of oral & laryngeal catarrh to the Eustachian tube, & Tympanum." (Meineyer Page 636).
The patient now takes to his bed. All the symptoms increase in intensity, & the fever reaches its-

heyht. The pkin is hot & dry; but liable to perspirations. The vomiting may have subsided. The tongue tends to be furred transversely, & dry. The teeth, gums, & tongue, are covered with a brownish black crust, which smells badly. There is great thirst; there may be soreness in the throat, & difficulty in speaking & swallowing.

The patient is generally somnolent, & stupid during the day. His sleep is disturbed by dreams; or he may be delirious.

There is generally now well marked diarrhœa. The number of motions daily, varies. May be from three to four, or even to twenty, in number. The stools have a very bad smell; & have the appearance of badly cooked pea soup. When allowed to stand they separate into two layers.

The Upper layer is watery, yellowish or brownish in colour, contains only traces of Albumen, & salts in solution including Chloride of Sodium & Carbonate of Ammonia. The last named salt gives the motions an alkaline reaction.

The lower layer of deposit consists of the remains of food & detritus of epithelial & mucus corpuscles, blood, small yellow flocculi, shreds of sloughs, globules, & triple phosphates.

The Chest usually shows marked dulness at the lower parts, the respirations are increased in frequency. There may be no expectoration, tho' Catarrh exists.

The Conjunctivae may be injected & the pupils dilated.

The Pulse is generally double, full, & soft, it frequently numbers 110 or 120 per minute.

The Patient may loose control of the sphincter or forget to empty the bladder.

Third week. about the middle of this week the patient may begin to recover. There is an improvement in all the symptoms, the stupor passes into natural sleep; & when awake, the patient recognises his friends. The Respirations become fewer, & the patient often expectorates some frothy yellowish mucus. The motions become less frequent, & of a more normal consistence. The tongue becomes moist at the tips & edges; & the fur is gradually thrown off. The temperature does not rise; but gets lower in the mornings.

In a large number of cases however, the patient passes into what is known as the "typhoid Condition". He becomes very weak, lies on his back, & tends to slip to the bottom of the bed. The somnolence & stupor increase. He may pick the bedclothes or get subsultus Tendinum, there is loss of control over the Sphincters, &

retention of the urine. All the symptoms are increased in intensity, but the spleen begins to subside. The Spots continue to come out, & may become paler or petechial. The pulse is more rapid, & towards the end becomes imperceptible at the wrist. Bedsores may arise on the sacrum & trochanters & part. exposed to pressure.

As the condition advances the patient passes into profound coma.

Brieture (Page 100) holds that this condition is due to uraemic poisoning. The disease is most fatal during this week. The average mortality ranges usually from 15 to 25 per cent, but differs in different epidemics. Death may be due to.

1) Gradual Asthenia alone, or combined with anaemia.
2) Direct loss of blood from epistaxis or intestinal haemorrhage
3) Poisoning of the blood from imperfect excretion, or the

absorption of septic matters.

(4) Hyperpyrexia.

(5) Oedema of the Lungs; Paralysis of the Heart.

(5) Complications, especially Perforation of the bowels & Peritonitis.

(6) Rupture of the Spleen, & Mesenteric glands.

Accidents.

Perforation during the first week.

Haemorrhages during the first week

Abundant Epistaxis during the second or third week, this is usually less dangerous, than intestinal haemorrhage; but is usually a bad sign. It is caused frequently by acute haemorrhagic Nephritis.

Complications.

Among the principal of these may be mentioned Thrombosis with embolism & its consequences, Pleuritic Effusion, Pneumonia, Pleurisy, Oedema, Kidney affections, etc.

Relapses, ~~ju~~ appear ten days after the temperature has become normal. Sometimes there is only a return of the pyrexia; but a true relapse has the characteristic symptoms & lesions. A Relapse rarely proves fatal.

Sequelae.

Among the most important of these are.

(1) Phlegmasia Dolens from thrombosis.
(2) Mental weakness or insanity.
(3) Otorrhea.
(4) Phthisis Pulmonalis.
(5) Partial anaesthesia or Paralysis.
(6) Neuralgia.
(7) Debility & weakness, due to the destruction of the villi & glands of the intestine, accompanied with a shrivelling of the Mesenteric glands.

The Temperature in Enteric Fever.

Wunderlich says "The course of the disease shows two sharply bounded distinct periods, which correspond to the deposition & reabsorption of the infiltrations & exudations. These periods in regular or nearly regular cases correspond with the first & last halves of the disease. In mild cases, the first period lasts one or one & a half weeks, the entire disease lasting three or four. In severe cases, the first period lasts for two, three, or three & a half weeks; the entire disease five or six, & occasionally eight or ten weeks.

In the first week it is such an absolute rule for the temperature to rise 2° towards evening & to fall one degree in the morning, that if the temperature on the second or third day be 104° or over, we may exclude Typhoid. Also if between the fourth & sixth days, the evening temperature do not rise to 103°; & lastly, if

the evening temperatures begin to decrease again as early as the second half of the first week.
A decided increase of temperature during the first week is unfavorable, but a slight increase is favorable.

In the second week we may exclude Typhoid if the temperature be below 104° on one or more evenings between the eighth & eleventh day.
Scarcely any other disease shows such repeated rises of temperature to 104°.
A favorable course during the second week, makes it probable that the third week will be still milder, & the convalescence. Favorable indications in the second week are — an evening temperature of 104° or 103°, morning temperature, one or two degrees lower, late occurrence of the exacerbations (not before 10 a.m.), early occurrence of remissions (midnight) & regular daily moderate decrease of temperature.

Unfavorable indications are Continued elevations of the morning temperatures, an increase in the evening to 103°.5 or more; an early recurrence of the exacerbations, & late occurrence of the remissions; & a high temperature at any time.

In the Third week, in mild cases there are great morning remissions, 3° or 3½° below the evening, & the temperature may become normal towards the end of the week; & from the middle of the week, the evening temperatures also decrease. In severe cases, the temperature sinks but little or even rises, & here we may expect a fourth week & not look for a decided decrease before the fifth week. Death may be expected if the temperature remains sometime at 107°; if it suddenly rises to 107° or 108°; or if it suddenly falls to say 94°."
(Meineyer Page 640).

A Marked fall in the temperature often gives notice of impending intestinal hemorrhage.

Varieties of the symptoms of Enteric fever.
There may be several forms in which it may occur.

(i) An Abortive form in which all the symptoms resemble normal Typhoid in the first week; but in the second week, all the symptoms are modified; & the temperature generally becomes normal towards its end, or at the beginning of the third week.
Only exceptionally are there a few spots on the Epigastrium. There is no diarrhea, or sensitiveness of the Abdomen.
In the 3rd week, convalescence sets in; but is slow.
A case illustrative of this form was that of Nelly H — aged 5 years, in whom all the symptoms were well marked ~~in~~ at the commencement; the temp- -erature was characteristic; there was no diarrhea; & only a few spots, viz: one on the epigastrium, & two on the back, were detected; Convalescence was established by the end of the third week.

(2) A form often known as Typhus Ambulatorius, in which the patient may suffer from little, if any indisposition, but suddenly may have perforation, or haemorrhage. This form is probably due to the person acting more locally than constitutional.

(3) A Constitutional form, in which the poison seems to act very little locally in the intestines. There is no diarrhea, but frequently there is severe bronchitis, early complicated with hypostasis & collapse of the lung or pneumonia. This form is often fatal.

As an instance of this form may be mentioned the case of John S— aged 36. When first called to see this patient, he complained of pain over the liver, feet hurt, severe frontal headache, & constipation, his temperature was 101°F, & this had the characteristic rise & fall throughout.

the highest point that it reached was 104·8°F. The pupils were dilated, & the conjunctivae injected. The headache throughout till the end of the second week was very severe. Quinine was given & icebags applied; but little relief was afforded until after the application of five leeches to the temples. There was great want of sleep, & when this was induced by a mixture of Chloral & Bromide of Potash, delirium of a wandering character ensued. Towards the end of the second week, the circulation became very feeble; & brandy was given. The constipation continued throughout the illness, & had to be relieved by enemata.

No spots were seen before the twelfth day; & then they continued to come out in crops of two & three until the nineteenth day.

Convalescence in this case was very slow, the patient not being able to resume his occupation (as clerk)

per over seven weeks from the date of the commencement of his illness.

(4) A very severe form, with all the symptoms very intence, & perhaps death in the second, or even in the first week, or perhaps it may follow the ordinary course during the second & third weeks. An instance of this form, was the case of Henry W— aged 5 years. The boy was delirious from the first, his temperature was characteristic of the disease, & all the symptoms were well marked. He was more or less unconscious throughout his illness, & died on the sixth day from its commencement.

(5) A very mild form. The patient has only a little gastro intestinal catarrh, with little constitutional ~~catarrh~~, but disturbance but the temperature is characteristic.

(b) A very slow form lasting six, or seven weeks or more, this is frequently due to convalescence being retarded by the healing of ulcers, or by bedsores spreading.

There are besides many grades of severity of the disease, differing more or less from the normal type, by the predominance of special symptoms as diarrhea, haemorrhages &c.

Diagnosis.

In all cases it is important to enquire thoroughly as to the History & surroundings of the case; as sometimes these & the temperature, are all that we can rely upon; since there may be an absence of spots, & of abdominal symptoms, with diarrhœa.

In distinguishing from Ordinary Gastric Catarrh, the temperature is also of the greatest importance.

From Typhus Fever, the main distinctions are provided, by the insidious commencement; the character of the rash, which appears earlier in Typhus & does not come out in successive crops; the abdominal symptoms, which are usually vague in Typhus, but well-marked in Typhoid; by the regular, diurnal variations of the temperature in Typhoid; & by the mode of termination, which is abrupt in Typhus; but gradual in Typhoid.

Prognosis.

The percentage of mortality varies little with age; but is less, below the age of twenty, than in the later periods of life.

We must be guided for the most part by the constitution of the patient; the severity of the disease, & by the occurrence of accidents or complications, but should be always very guarded.

Treatment.

Prophylaxis is essential, since the poison spreads from the dejecta. All discharges should be disinfected before being passed into the sewers. All clothes soiled by the discharges should also be subjected to the action of disinfectants.

For this purpose may be mentioned, Carbolic Acid, Condy's Fluid, Chloride of Zinc, Sulphate of Iron.

It were better if the discharges could then be buried in a place distant from any water source or supply, so as to avoid the risk of contamination of wells.

The use of suspected water or milk should of course be discontinued.

General Treatment.—The patient should be kept in a well ventilated room, the temperature of which should be about 60° or 65° F.

The body should be sponged twice or thrice a day with a weak solution

of Hydrochloric acid or Alcohol; & should be kept scrupulously clean from discharges, since these may cause erythema, & subsequent bedsores. If Erythema appears, we should wash the parts with a solution of alcohol; & relieve pressure by the use of cotton wool; or water cushions. The mouth should be washed out with a solution of Chlorate of Potash or very weak Concs. Fluid, or a little warm water, so as to prevent the sticky mucus drying & decomposing. If this is done, the patient enjoys his food better & has less dislike for it. The Diet is of great importance. For the most part animal foods should be given. Many give beefteas, mutton or chicken broth, Milk, eggs, custards &c. The motions should be watched, & not allowed to become too bulky, or contain undigested food, as is sometimes the case after giving cornflour, arrowroot etc.

As regards drink, we may give such things as Soda & Milk, Barley water sweetened & with the juice of a lemon added & Lemonade,

Therapeutic Treatment.

In mild cases very little medicine is required. We may give ten minim doses of Hydrochloric Acid every four hours. In the second week if there is any Bronchitis, we may give a little Ipecacuanha, with the Acid, & in the third week should give doses as Cinchona.

Various special forms of treatment have been recommended.

A The Antiseptic treatment, by the use of Creasote, Carbolic Acid &c.

B The Hydropathic

C The Purgative

Calomel has been strongly recommended during the first week, before any spots have appeared, & where there is little diarrhoea, & has

been suspected to cut short the attack, by Wunderlich Vetters. Iodine is considered as specific by Willebrand, Liebermeister also recommends its use.

Undoubtedly a dose of Calomel or Castor oil may do good, at the very outset of the disease; but after the first three or four days, it is much safer to resort to enemata, if constipation be present. If Diarrhoea be present, it is best not to interfere with it, unless it becomes excessive, in that case, we must try to lessen the catarrh of the bowels, & limit the formation of the stools. For this purpose, Bismuth should be used, as it has a sedative action on both the Stomach & bowels. The best form for its use is the following.

℞ Bismuth: Subnitrat: ℥i:
Sodae : Bicarb : ℥ss:
Sp : Chlorof : ℥i:
Aq : Hydrocyan(Scheele's)℥viii:
Mucilage q.s. Ad : ℥viii

Sig/ ℥i every four hours.

This tends to lessen both the vomiting & the diarrhoea, & soothes the system generally; for the diarrhoea also, we may give the Pulv Cretae Co. or Pulv Cretae Co. c Opio; but it is best not to use opium during the first stage. Acids have a doubtful utility, sometimes we may have to resort to enemata of Starch & Opium.

Murchison, Todd, Rotters argue that we should always restrain the diarrhoea. They say "Restrain Diarrhoea & Haemorrhage in Typhoid fever, & when you have fairly locked up the bowels, keep them so,. Patients will go for four or six days or even longer, without suffering inconvenience from the state of constipation." (Aitken Page 621).

For the treatment of Meteorism, we must limit the discharges. We give Turpentine, or charcoal or use enemata containing assafoetida & Opium.

If it be caused by the accumulated

of excreta, may use bland or turpentine enemata.
Flannels soaked in Turpentine, & sprinkled bandaged over the Abdomen, prevent the accumulation of flatus, & give support" (Welch Page 159).

For sleeplessness, we may use Bromide of Potash, Henbane, Chloral, or Dovers Powder. Alcohol very frequently does good, especially if the patient is very weak. We should reduce the calls to stool. Opium should be very carefully used, if at all, during the first days of the disease.

For Intense Headache, we should use cold applications, as vinegar & water, or brandy & water, or icebags. May sometimes require two or three leeches, but it is better to avoid the use of these if possible. Internally we may give a mixture of Bromide of Potash & Chloral, as the want of sleep is frequently the cause of the headache.

For Excessive Perspirations, we may give a mixture containing Acid Sulph Aromat & Liq. Opii Sed.

For Excessive Pain in the Abdomen, give use Turpentine stupes, hot fomentations, sinapisms, or in plethora, the application of a few leeches in the Iliac fossa frequently give relief.

If there be much Tenesmus give starch & opium enemata.

For Constipation, a dose of Calomel or of Castor oil is recommended in the earliest stage; but it is generally safer to use soap & water enemata.

For Hyperpyrexia, we may give Quinine especially in the Tropics, or if there is any malarial element in the case. Digitalis has been highly recommended by Wunderlich & others. Of internal remedies failing we may use wet packing, douches, sponging; but it is best to give

baths according to Brennemann's plan. He says "put the patient in a bath at 94°. While the body & limbs are gently rubbed, pour cold water into the bath, until the water is reduced to 68°. The patient should remain in the bath, 20 or 30 minutes, until he is slightly chilled; then take him out & put him in a warm bed."

Meinzer (Page 652) says give 1 or 2 grs of Quinine with the baths, & then we have not to repeat them so frequently.

For a weak & failing heart, Digitalis is especially useful; or we may give alcohol in the form of brandy. Alcohol is most useful after the first stage, for the hyperemia & prostration. It may be used in the first stage, if great weakness, tremors, or active delirium is present.

Haemorrhages from the bowel. We must here use cold or ice compresses, Alum astringents, Opium.
If there is Abundant Epistaxes, astringent lotions should be applied; but sometimes we have to plug the nostrils.

If Perforation occurs, we must apply cold compresses, & give internally ice or iced water, & Opium in large doses as 3ri every hour or two.

Peritonitis must be treated with cold compresses, Opium, & the general treatment of peritonitis.

Complications, as Pneumonia, Pleurisy Oedema, Kidney affections &c, must be treated on the general plan.