is admitted by the second channel, as in the ordinary cases of typhoid fever, as it then has lain in the earth for some time and afterwards (as usually happens) been washed or percolated into the wells, and, after being received into the stomach, undergoes the action of the gastric juice before it effects an entrance to the blood.

The question may now be asked in what way is the origin of these cases, apparently arising from some component of putrefying blood, connected with the vast number of typhoid fever cases which appear to arise from the pollution of drinking-water by the excrement of human beings? In this manner, by fixing upon the serum of the blood as the essential factor of the poison, we at once see how any severe case of diarrhoea would be sufficient to produce the disease, because the liquid evacuation of severe diarrhoea is principally composed of serum of blood, and it is drawn from a source and placed in a condition highly favourable to the development of the putrefactive process. If decomposing blood be capable of giving rise to typhoid fever, and if the decomposing liquid evacuations of diarrhoea have the same property, then serum of blood, which is the only component common to both, must be the poison factor.

By this process of reasoning, I had already arrived at the conclusion that severe cases of diarrhoea might give rise to typhoid fever in others, before the contribution of fever cases apparently owing this origin to the medical journals. Of this class, are those contributed by Dr. Low in the BRITISH MEDICAL JOURNAL for 1876, vol. i, page 659. Four cases occurred in an isolated house, where "the privy was found running over and so full that the seat could not be used". He goes on to describe a second group of cases, also four in number. "Two little boys attending a day-school had an attack of diarrhoea. One of the boys passed his evacuations in bed, but was able to go to school next morning. The mother of the boys employed a charwoman to assist her in washing the soiled bedclothes. An aunt of the boys also assisted. Within a week, these three persons were seized with symptoms of enteric fever, which developed rapidly and proved fatal to the mother and the aunt. All three were engaged in the cleaning of the soiled linen, and were nauseated by the foul smell of the evacuations." Dr. Low goes on to prove the exclusion of all possible sources of the specific infection from any prior case of the fever, either of the boys or of the women, and at length concludes: "In the absence of any proof to the contrary, we must admit that the disease began from the inhalation of the fetid stools of the boys; that the emanations from these stools poisoned the systems of the three individuals who inhaled them, and the filth-fever was generated."

In connection with this *de novo* origin of the fever, from the decomposing liquid evacuations of diarrhoea cases, it would seem something more than a coincidence that the belief is now nearly universal among practical physicians that, when the disease is propagated continuously from case to case, it is believed to be so propagated only by the medium of the stools. (*Vide* BRITISH MEDICAL JOURNAL, March 25th, 1876, page 383.) In my own management of these cases, I have never found any reason to regret my confidence in this belief. This would also tend to prove that an albuminous liquid is required to propagate and transmit the contagium of the disease to another healthy individual, or why should it not be equally communicated through the medium of the other excretions and secretions of the body?

This theory of typhoid fever, arising from the decomposition of the serous evacuations of severe diarrhoea, accounts in a more satisfactory manner than any other for the extraordinary prevalence of the fever at a certain period of the year. It is a fact of universal observation that enteric fever cases reach their maximum, in point of numbers, in the months of October, November, and December; and this "periodical disposition" to the disease is accounted for by Liebermeister, who believes that "the real cause of every epidemic and every isolated case of typhoid fever is only the specific poison of typhoid fever" (*Ziemssen's Cyclopadia*, vol. i, page 61), in the following manner. He says (*ibid.*, vol. i, page 65): "The curves representing the frequency of typhoid correspond to the curves of average temperature, only with this difference—the different points of the typhoid curve follow those of the temperature curve by an interval of some months"; and, in order to account for this discrepancy, he says it takes two or three months for the changes of temperature to penetrate to the breeding places of the typhoid germs.

But if it can be shown that typhoid fever may arise from the putrefactive decomposition of blood-serum, then the abundant prevalence of summer cholera, from the end of July to the beginning of September, affords plenty of material for the elaboration of the poison, which afterwards percolates into the wells or is washed by the autumnal rains into the sources of our water-supply.

I do not propose to enter into the discussion as to whether this disease can have an abiogenetic origin, although the facts upon which

my theory is founded appear to favour that doctrine. Whether the fever arises only from the specific typhoid germs, which (according to the advocates of this theory) have a nearly omnipresent existence, and have the property of preserving their vitality in a dormant condition for many years, ready to spring into active and vigorous life when introduced into a proper nidus for their development; or whether the poison is manufactured from the ordinary germs existing in all the putrefactive processes which take place in certain animal fluids, or is elaborated by some subtle chemical change in the properties of the substance itself, does not signify so much to those who have to deal practically with the disease, so long as we can put our finger upon the factor, element, or pabulum without which these forces would be rendered permanently impotent.

It is from the conviction that this pabulum will be found in albuminous liquids, such as blood, blood-serum, and the liquid discharges from the bowels in diarrhoea, and that the poison of typhoid fever is elaborated from the putrefactive changes which occur in them after their expulsion from the body and subsequent exposure to the air, that I have ventured to draw the attention of the profession to what appears to me to be a probable explanation of the origin of this disease.

CASE OF SPINAL SCLEROSIS.*

By JOHN S. BARTRUM, F. R. C. S.

S. S. DIED September 1876, aged 73. She was a hearty vigorous woman, mother of nine children. Her mother was healthy; her father, though gouty, lived some years past eighty.

When about fifty-eight years old, she complained persistently of pains in the regions above the left shoulder and down the left arm; these, at the beginning, seemed to be rheumatic, and were relieved by friction; but very gradually the arm became tremulous and lost power, with sensations she termed "pins and needles". The same loss of power and subsultus extended to the left leg, thence to the right shoulder and right leg. She could move with difficulty, and not without help. Up to 1862, she, with help on each side, could walk a mile; she then had a long illness, after which she never walked. The voluntary muscles of the whole frame gradually lost their power, while many were in continuous tremulous action. For two or three years before her death, her state was very peculiar and interesting. She lay rigid and at full length on her back, the fingers stretched out, with tonic contractions of the tendons of the forearm and elbow, so continuous that it was impossible to feel the pulse at the wrist or elbow. The wrist, elbow, and shoulder joints were all fixed by muscular action, not rigid, for each could be forcibly bent. The toes were stretched forward and the foot extended on the leg, but the subsultus was not so marked as in the upper extremity. The thigh could be forcibly bent on the trunk, the rigidity being muscular, not articular. In the legs, when not well as usual, there were occasional spasmodic twitches and painful stretchings. In the earlier history of the case, there had been much uneasiness at the back of the neck, the muscles of which and of the back were in a state of equal tension, but not the muscles of the face, which was calm and could readily smile or laugh. The head was fixed as firmly as the limbs. Mrs. S., when put on her legs, was raised as a fixed trunk, exactly as is seen in acrobats, or as in a corpse when in the most marked stage of cadaveric rigidity. About 1868, her speech began to be difficult and voice faint, till, for some years preceding her death, the power of speaking was wholly lost, except such forcible expirations as "Yes" or "I won't". Those about her guessed her wishes, which she signified by the slightest expirations, not whispers; her assent or dissent being given by closing her eyelids or movement of the eyes. All voluntary power of the muscles of the cheeks or tongue was gone. There was no tremor of tongue or nystagmus.

Towards the end of her life, the mouth was always open, the tongue being within the mouth. She could not masticate at all, the slightest hard crumb causing imminent suffocation. This was, however, much modified by the flavour of the viands; she readily swallowed champagne, if still, but medicine could only be got down by teaspoonfuls. The slightest cough always caused anxiety lest the mucus should cause suffocation.

Sensation was everywhere perfect; a pinch or tickling of the legs caused spasmodic muscular action, and the reflex action on tickling the soles of the feet was quite painful. A ridge in her clothes was painful to her.

The digestion was good. The bowels and bladder acted naturally, and the nurse learned by intuition when it was needful to place her on

* Read before the Bath and Bristol Branch.

the night-table. She could sit in a chair for a short time, and, till within a week or two of her death, she enjoyed carriage exercise. There was no muscular atrophy, nor did bed-sores form. Till the last hour of her life, her mental powers were perfect, being fully conscious and most pleased at the presence of her children around her dying-bed. She enjoyed reading, the leaves of the books being turned over by her attendants. Her powers very gradually failed; but there were no special symptoms except that, during the death-struggle, the muscles of the head and face were painfully distorted, but not the muscles of the trunk.

The pathology of the case is to me unknown. It resembled the unceasing tremulousness of paralysis agitans, and, like these, the muscular movements ceased during profound sleep, but began immediately on waking; indeed, the cessation of the muscular movements was often the only means of knowing whether or not she was asleep.

This case afforded the most marked example of the independence of the mental power of the spinal system; for though, as regarded her bodily movements a corpse, she ruled, not managed, a large household by her strong will; her wishes, as far as they could be learnt, being the law to those about her.

There was no *post mortem* examination.

I venture to add Dr. E. Long Fox's suggestions as to the probable cause and sequence of pathological changes in the spinal cord: 1. Spots of subacute myelitis; 2. As a sequence of this, spots of miliary sclerosis in the anterior column; 3. Larger patches of sclerosed tissue in the grey matter, and possibly even in the posterior column, but not affecting the anterior cornua; 4. The same sclerosed condition of part of the medulla oblongata, especially about the nuclei of the vagus, hypoglossal, and spinal accessory nerves.

ERYTHROXYLON CUCA IN THE TREATMENT OF TYPHUS AND TYPHOID FEVERS, AND ALSO OF OTHER FEBRILE DISEASES.

By SAMUEL McBEAN, L.R.C.P.Ed.,

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SINCE Dr. Ringer made the important discovery that the amount of urea excreted by the kidneys stands in a certain relationship to the temperature of the body, it has been ascertained that in all febrile diseases, with the exception of yellow fever, the amount of urea formed is abnormally increased; and representing, as urea does, the wear and tear of the frame (tissue metamorphosis), it may be regarded in fever as affording not only an index to the severity of the disease, but also a direct clue to an exceedingly important line of treatment.

I will further illustrate the position I assume in this paper by submitting that, as throughout the duration of a case, *i.e.*, of typhus fever, there is present a specific morbid agency which so influences the sympathetic nervous system as to produce or permit an extent of tissue metamorphosis (indicated by the increased amount of urea excreted) not only incompatible with health, but most probably productive of the various febrile phenomena, the sum of which constitutes this disease; therefore, to restrain such metamorphosis until the morbid agency has ceased to exist, is clearly indicated as the most desirable end to accomplish in treatment. To accomplish this end, I believe we possess a very efficient remedy in *cuca*, the dried leaves of the *erythroxylin cuca*. I need not say anything of the properties ascribed to this drug (the subject having already been very freely ventilated), beyond stating that, when indulged in by a healthy person, it prevents for a time the feeling of fatigue, and diminishes the amount of urea excreted—subjective and objective signs of tissue-metamorphosis—and that in this property lies its value as a therapeutic agent.

CASE I.—Mr. R., aged 34, of a phthisical family, came under my care on September 8th, suffering from the usual premonitory symptoms of specific fever. He had been unwell for some time previously, but not confined to bed. Until September 15th, there was no perceptible increase of temperature, but from that date the ordinary symptoms of typhoid fever rapidly developed; and on the 19th the patient's condition was as follows. He complained of severe occipital headache and vertigo; sore-throat; pain in the back at the lower angle of the scapula; slight ileo-caecal pain; painful confusion of thought, with occasional delirium. I found the mucous membrane of the fauces much swollen, red, and ulcerated; the tongue moist and thickly coated; slight hypostatic pneumonia of the lower lobe of the right lung; sputa muco-purulent, streaked with blood; the abdomen slightly tympanitic; diarrhoea feculent. He had occasional paroxysms of profuse diaphoresis; also an abundant crop of miliaria

crystallina. Decubitus was dorsal. Pulse 108. Temperature at 10 A.M., 102.40; at 10 P.M., 104. Respirations per minutes 36. The amount of urea excreted during the preceding twenty-four hours was 59.05 grammes (2.08 ounces). Until to-day, the treatment had been purely expectant. The patient was ordered a drachm of tincture of *cuca* in water every four hours.

September 20th. He had spent a better night; said he had "greater control of his thoughts". There was no delirium. Temperature at 10 A.M., 100; at 10 P.M., 102.40. Pulse 104. Respirations 30. The amount of urea excreted during the preceding twenty-four hours was 53 grammes (1.87 ounces); the diarrhoea was much the same; and there was still much diaphoresis. He complained that the medicine produced flatulence. The tincture was continued in doses of a drachm and a half with fifteen minims of essence of ginger, every four hours.

September 21st. There was now no confusion of thought. Temperature at 10 A.M., 99.40; at 10 P.M., 100.50. Pulse 98. Respirations 26. Urea excreted during the preceding twenty-four hours was 48 grammes (1.7 ounces). Much less diaphoresis and flatulence. The patient's general appearance much improved. The *cuca* to be continued as before.

September 22nd. No pneumonic crepitation; sputa mucous. Yesterday and to-day, he had been able to read the newspapers. Diarrhoea still continued. Temperature at 10 A.M., 99; at 10 P.M., 100. Pulse 87. Respirations 22. To-day, there were a few spots of typhoid roseola on the abdomen. He was ordered two drachms of the tincture of *cuca*, combined with a drachm of liquid extract of bael, with a view to restraining the diarrhoea.

From September 23rd to September 29th, the patient continued to improve; the temperature, pulse, and respiration on the 29th being about normal. The diarrhoea ceased on the 27th, and on the 29th the amount of urea excreted daily had fallen to 27 grammes (416.7 grains), and I now considered convalescence fairly established; but on the evening of the 30th the patient, having become rather careless, allowed himself to be exposed to a draught of cold air from a window. This was succeeded the same night by rigors. On October 3rd, he was suffering from a severe attack of lobular pneumonia; and on the 10th, I regret to say, he died.

I have treated two or three other cases of typhoid fever with *cuca*, and in each case obtained a favourable result; but have selected this case for publication, as in the others I made no quantitative analysis of urea.

CASE II.—C. B., aged 46, was seized on October 3rd with the usual premonitory symptoms of fever, and on October 10th the patient's condition was that of a well marked case of typhus fever. Temperature 104; pulse 108; respirations per minute, 34. The amount of urea excreted during the preceding twenty-four hours was 58 grammes (2.05 ounces). I prescribed a drachm of tincture of *cuca* every four hours. From October 10th until October 18th, the tincture was continued, and the dose gradually increased to three drachms every four hours. On the 18th, the amount of urea excreted during twenty-four hours was 28.05 grammes (nearly one ounce). With the diminished amount of urea, there was a corresponding diminution of temperature, pulse, and respiration, all of which at this date had become quite normal. In this case, no remedy save the tincture of *cuca* was used; and, as in the preceding case, from the time the patient began to take the tincture until convalescence was established, there was a daily amelioration of symptoms.

CASE III.—I would here refer to a case of protracted convalescence after typhoid fever. On September 17th, I was called to see Mrs. S. She informed me that she had been suffering from typhoid fever about two months ago. I found her very much emaciated, and confined to bed, from which, I was told, she had not been moved for two months, not even to have the bed made. She seemed to suffer entirely from extreme debility. The temperature was irregular, but generally high in the evening, with slight nocturnal perspiration. The respiratory murmur was normal. The amount of urea excreted during twenty-four hours was 56.05 grammes (nearly two ounces). I ordered an infusion of *cuca*-leaves to be taken when thirsty, and did not see her again for a week, when I found her much improved and able to sit up. She informed me that she experienced "great support" from the infusion for about an hour after taking it; and that, when she found she required further support, she repeated the dose. I had not another opportunity of making an analysis of urea.

I have also found *cuca* of great service in both acute and chronic pneumonic phthisis. Where there is much febrile excitement, it lowers the temperature and restrains or materially alleviates the distressing perspiration. In febricula, also, it may be used with great advantage.

I do not, however, wish it to be understood that I regard *cuca* as sufficient to meet every complication that may arise in specific or other