*Copy of a Letter on the Subject of Tetanus, from
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cian to the Naval Hospital at Deal, to the Com-
missioners for Transports, London.*

Naval Hospital, Barbadoes, 22nd February, 1808.

GENTLEMEN,

In my letter of the 30th of October last, I proposed to communicate to you in my next, some circumstances relative to tetanus; and with this view I now beg to submit for your consideration the four following cases, which will go far to prove, that when that disease appears to originate in dissimilar causes, it depends on, or at any rate is attended by, inflammation of the abdominal viscera; for whether it be the original cause, or only a consequence of the disease, is a question which future experience and dissections can alone determine. Placed as you are at the head of an extensive medical establishment, you might obtain from the surgeons employed under your directions, the histories and dissections of patients who may die under their care, of this disease; and should the morbid appearances resemble those I am about to relate, it may lead to a more rational mode of cure, than the present ever varying plans, which we are obliged to adopt from a want of just principles to direct our practice.

Early in May, 1806, I was requested by a parti-

cular friend to see an African boy about 14 years of age, who, he said, had suddenly been taken ill of cold, and sore throat. Upon my examining the boy, he complained of uneasiness of the throat, and a difficulty in swallowing; the jaws could not be opened to admit an inspection of the throat, a circumstance which not unfrequently occurs in cynanche tonsillaris; but no spasms were there present. He was directed to take six grains of the submuriate of mercury joined to ten of the compound extract of colocynth; he was also to use an acidulated gargle, and to have the external fauces rubbed with a stimulating liniment. In a few hours afterwards the purgative medicine not having operated, he was directed to take an ounce of the sulphate of magnesia, and in attempting to take this medicine, both the trismus and opisthotonos were first observed, and increased upon every subsequent attempt at swallowing. He now took eight grains of submurias hydrargyri every second hour; frictions with the unguentum hydrargyri first were used to the jaw, neck, arms, and thighs; and he was submitted to the cold affusion, so as almost to induce syncope. Within the first twenty-four hours he had taken 70 grains of calomel, and rubbed in two ounces of the mercurial ointment; the cold affusion had been applied 8 times, and several enemas were thrown up, but all of them were retained. The spasms recurring more frequently and with increased severity, the warm bath was substituted for the cold affusion; the mercurial frictions were

continued, and he took sixty drops of laudanum every second hour, in as much wine as he could swallow; and a blister applied to the surface of the abdomen. He died in a state of extreme misery about 48 hours from the time I first saw him. My attention during his life was directed to the abdomen, which I repeatedly pressed during the absence of spasm, without exciting pain or uneasiness. This case was supposed to have originated in cold, as he had not received any injury or hurt. Having obtained permission to open the body, I found the small and large intestines much inflamed, and in many places approaching to a state of gangrene; other abdominal viscera sound. Having observed sufficient to account for his death I did not prosecute the dissections farther; a circumstance which I now regret.

CASE II.

Jer. Collins, ætat. 30, a seaman belonging to his Majesty's ship Canada, was admitted a patient into this hospital, on the evening of the 1st of June. The jaws were not completely locked; most painful contractions of the muscles of the neck and back upon every effort at swallowing or speaking, skin perspirable, bowels bound. The first phalanges of the fore and middle fingers of the right hand had been amputated on board, about 12 days ago, and

are now nearly cicatrised. The tetanic symptoms appeared on the morning of the 31st May, soon after he had been on deck for a drink of cold water. He has taken on board under the direction of Mr. Booth, the very able and judicious surgeon of that ship, laudanum in large doses both into the stomach and by glysters. Frictions with stimulating liniments and the warm bath were also employed.

Adhibeatur quam primum enema domesticum. Descendat in balneum tepefactum. Habeat submur. hydrarg. gr. viij sub forma boli secunda quaque hora. June 2nd, unable to swallow the smallest quantity of fluid, and every effort to speak induces the most excruciating distress, no sleep.

R Decoct. Amyli, ʒij

Tinct. opii ʒij M. ut fiat enema. Injiciatur.

Died at 12 o'clock.

Sectio Cadaveris.

Strong marks of inflammation both of the internal and external coats of the stomach. Villous coat covered with a peculiarly offensive smelling yellow matter, small intestines much inflamed; caput cœcum coli, and colon, bordering on a state of sphacelus; convex surface of the liver redder than usual, concave surface livid; gall-bladder turgid with bile; œsophagus inflamed to within two inches of the pharynx, its mucus yellow, resembling that found in the stomach; pharynx and parts about

the neck and jaw of natural appearance. Lungs healthy ; did not examine the head.

CASE III.

Wm. Merrit, ætat. 30, seaman belonging to his Majesty's ship *Blonde*, was admitted into this hospital on the 25th of September, 1807, with an extensive sloughing ulcer upon the ankle, and back of the right foot. After various changes, and repeated proposals to have his leg removed, he at last consented to the operation, when the powers of life seemed too much exhausted to admit of my entertaining any sanguine hopes of his recovery ; however, on the 20th of November the limb was removed below the knee. The stump looked remarkably well, all the ligatures were removed, and his strength rapidly improving, when on the 3rd of December he complained of slight involuntary contractions of the muscles of the face ; 4th, considerable rigidity of the jaw, and spasms of the muscles of the neck and back, countenance mournful.

Mittatur sanguis e brachio ad ℥xviij. Descendat in bal. calidum et habeat quam primum pulv. convol. jalap. supertart. potassæ ana ʒss.

5th. Rigidity of the jaw and spasms of the back and neck not increased, although extended to the lower extremities. The warm bath last night was followed by profuse sweating for six hours. No stool.

• Habeat submuriatis hydrargyri gr. iv. forma pilulæ omni tertia hora donec alvus bene soluta sit.

6th. Rigidity of the jaw and spasms somewhat increased since yesterday; pulse rose last night after taking away from the arm about sixteen ounces more of blood; had a stool yesterday after an enema, and one spontaneous loose stool this morning; skin perspirable; appearance of the stump rather unfavourable.

R Submur. hydrarg. Pulv. antimon. ana gr. vj.

Camphoræ gr. x. conserv. rosar. q. s. M. et divide in pilulas vj. quarum capiat duas ter die. Descendat in balneum calidum mane et nocte.

7th. Spasms of the muscles of the neck and back; more frequent deep-seated pain under the sternum; pulse low; perspires freely; one stool. Repetantur pilulæ ut heri. Adhibeatur emp. lyttæ sterno.

8th. Much as yesterday, perspires less, bowels

bound. Repetantur omnia. Injiciatur enema catharticum.

9th. Slept better than he has done for several nights; muscles of the jaw more relaxed; spasms much as usual; had an enema last night, which is still retained; stump unhealthy. Continuentur pil. et baln. calid. Injiciatur enema.

10th. Passed a bad night; spasms severe; a gangrenous spot on the anterior edge of the stump; one free stool; continentur omnia ut heri. Habeat etiam haust. anod. ex tinct. opii 3j. hora somni.

11th. Every appearance of approaching dissolution; inside of the lips slightly ulcerated, as if by the action of mercury; no ptyalism. Died at 2 p. m.

During the continuance of the disease, the jaws were not so much shut as to prevent his receiving nourishment, especially after the second bleeding.

Dissection.

Stomach much drawn up under the diaphragm. Intestines in several places inflamed, chiefly the ileum; stomach and intestines inflated with air; no

mark of disease in the œsophagus, pharynx, or larynx.

CASE IV.

William Harris, seaman belonging to his Majesty's brig *Curieux*, badly wounded in the left arm near the shoulder, was received into the hospital on the evening of the 4th Dec. 1807. He would not submit to the removal of the arm that night, but next morning it was taken off at the shoulder-joint. In consequence of the extensive injury the soft parts round the shoulder had received from the wound, the upper flap fell into gangrene, and partially sloughed. On the 13th of December all the diseased parts had separated, and the ligatures had come away. The appearance of the wound was altogether healthy.

Dec. 16th, was restless, and somewhat delirious in the night, pulse sunk, granulations of the wound pale, bowels open. His wine and porter to be continued.

Haust. anod. hora somni.

17th. Complained last night of stiffness of the jaw, and contractions of the muscles of the face and neck; took sixty drops of the tinct. opii at bed-time, and repeated it in the night. This morning the spasms of the neck extended to the

back, and are increased in frequency and violence ; pulse quick, and scarcely perceptible. Habeat tinct. opii ʒi tertia quaque hora, vel pro re nata.

18th. Spasms continued with unremitting violence. Was put into the warm bath last night. Died at 9 o'clock this morning.

Dissection.

Stomach singularly contracted, internal coat exhibiting appearances of inflammation, and much yellow-coloured mucus adhering to it. Portions of the intestines inflamed, particularly the ileum ; a very extraordinary yellow fluid, resembling that in the stomach, was in great abundance in every part of the internal canal, which, upon cutting into the intestine, effervesced on coming in contact with the external air ; liver diseased ; did not examine the thorax or head.

These are the only cases of tetanus that have occurred to me during a period of nearly four years in which I have had charge of this hospital, where a great number of wounded men, including prisoners of war, as well as our seamen and marines, have been received ; and where a great many operations, in consequence of wounds and ulcers, have been performed. Inflammation of the stomach and intestines, and in two cases a peculiarly offensive smelling yellow matter, pervading the intestines, were

the most prominent morbid deviations from health which were discovered upon opening the bodies from four to six hours after death. But whether the inflammation be a primary or secondary affection, I am not prepared to answer. In severe instances of the opisthotonos, no doubt the pressure of the abdominal muscles on the contained viscera might induce inflammation, for when the muscles of the neck and back are thrown into contractions, the abdominal muscles act as antagonist muscles with great violence; and the abdomen, during the continuance of the spasm, feels hard like a board under the hand.

The inflammation in this disease is different from enteritis, or from that which is present in persons who die of the endemial fever of the country. In enteritis the intestines often adhere to one another by layers of coagulable lymph, recently thrown out; flakes of curdled matter are often found, and pus sometimes is formed. In the inflammation attending tetanus there are no adhesions, no formation of pus.

In the endemial fever the whole of the small intestines is more uniformly inflamed; the internal coats of the stomach and intestines exhibiting gangrenous spots and patches. The colon always contracted, but very rarely inflamed. In tetanus the colon was equally inflamed with the small intestines, and not contracted.

The yellow matter found in the stomach and intestines is very remarkable. It occurred in Collins and Harris, both of them treated on the stimulating plan, and it is probable had the intestines in the first case been opened, a similar matter would have been found. Is it to be considered a feature of the disease? or was it the consequence of the quantity of laudanum exhibited?

Merrit obtained an evident relief from blood-letting, and the warm bath. The disease was longer protracted, and the morbid appearances after death were not so strongly marked as in the other cases. The blood drawn shewed no signs of inflammation.

It is remarkable formerly, that tetanus should have been a very frequent disease in the West Indies; and now that it is scarcely known in the navy and army; but an inquiry into the causes which have contributed to render this disorder less frequent is not my present object; I only wish to draw your attention to the obtaining of information of a disease, the nature of which is so imperfectly known; and which, when it does occur, is one of the most fatal to which man is obnoxious.

I have the honour to be, Gentlemen,
Your most obedient and very humble Servant,
D. MACARTHUR.

The Commissioners for Transports, &c. &c. London.