NOTES
ON
AN EPIDEMIC OF
MALARIOUS YELLOW FEVER
OCCURRING ON BOARD H.M.S. DORIS SHORTLY
AFTER LEAVING PORT ROYAL, JAMAICA,
MAY 18TH, 1873.

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WRITERS distinguish between "malarious" yellow fever and what they term "specific" yellow fever. The former they classify as a remittent, the latter as a continued form of fever. They also state that albuminous urine, and suppression of urine, occur in the specific disease, but not in the malarious form of the fever. This, I find, is all the difference that they acknowledge as existing between the two. I must here state that the detached squadron, consisting of six frigates, arrived at Port Royal, Jamaica, on May 14th, 1873; here the Doris remained at anchor till May 21st, when she steamed up to Kingston, and gave leave to the crew. The Doris remained at Kingston till the 27th May, the men having had free communication with the shore the whole time. On the 28th May the squadron left Jamaica for the island of Nassau, New Providence. Port

Royal and Kingston at the time of the visit of the detached squadron were reported to be quite healthy and free from yellow fever. The temperature of the air was, however, high, viz. 84° to 85° Fahr., and it remained so night and day; at the same time, as it was nearly always a calm, the air felt close and stuffy; even the regular sea-breeze sometimes forgetting to pay its accustomed morning visit. After 5 o'clock in the evening the air was still, not a breath was stirring, the nights were hot and stuffy, and the malarious odours from the shore could be distinctly smelt on board the ship, which was from 50 to 100 yards from the shore.

Between May and October is the malarious yellow fever season, so fatal to visitors to the island of Jamaica, whose seaports are situated low down on the sea-shore, the land being flat and swampy.

Most authors agree that it is most difficult to distinguish between malarious yellow fever and the so-called specific yellow fever.

The first case of malarious yellow fever happened on board the Doris on May 28th, the day the ship left Port Royal for Nassau. This was the case of Thomas Y—, whose temperature chart it will be seen has much the appearance of a case of typhoid fever in its later stages, but this man never suffered from any typhoid symptoms; he was evidently suffering from a malarious fever; he complained of headache, giddiness, epigastric pain, nausea, loss of appetite, and muscular debility; his skin was hot, face sallow and pinched, tongue coated with a creamy fur, urine scanty and high-coloured, but not albuminous, of normal specific gravity; the temperature in the axilla but slightly above the normal at first, in the course of a few days rose to 103° Fahr., and continued high until the sixteenth day of the fever, rising at night and falling in the morning with great regularity.

He was given an emetic in the first instance, afterwards saline mixture, then quinine. He had bland diet, port wine, iced drinks, and barley water. Although he suffered from nausea he never had much vomiting, and was convalescent by the 20th day; his temperature, however, was still above

Remittent fever (malarious yellow fever). Temperature Chart.—Case of Thomas Y—, et. 24, A.B.

Line of Normal Temperature, 98.4°. M. Morning; E. Evening.

the normal, and the sallowness and pinched appearance of the face remained, and he still occasionally suffered from giddiness. Had there been no evidence of an epidemic of malarious fever existing at this time I should have considered this a case of a continued type of fever, for there was never any genuine remission of the symptoms.

The day after this case happened two other cases occurred. One of these, Thomas N—, was so similar to the one above described that it would be a mere repetition to detail it here.

The other of these two cases, however, Thomas M—, suffered from the same symptoms as did the two previous ones for the first three days, when the fever became more sthenic in its nature, and he died on the fourth day of undoubted black vomit. He was a fine healthy and muscular young fellow, of very temperate habits generally, but on this occasion appears to have broken out into excesses at Kingston after the violent exertion of boat racing. He was placed on the sick list on May 29th, 1873, with febrile symptoms, having been exposed to malarious influences on May 24th. On this day he was pulling in a racing boat at Port Royal, and in the evening he went on shore at Kingston to enjoy himself; he was picked up in a gutter intoxicated that night, and came off to the ship next morning; he went on shore again, I believe, several times during the next two or three days. On the morning of the fourth day of the fever, there having been nothing remarkable in his previous symptoms, the temperature in the axilla rose to 103° Fahr.; he now had much nausea and vomiting of frothy mucus; the skin and conjunctivæ were yellow, and he had pain in the epigastric region. He was ordered a sinapism over the stomach, saline mixture, bland diet, iced lemonade, barley water, and wine. At noon he said he felt better, sat up in bed and took his dinner, but I noticed at this time that his eyes had a dark rim round them, and the lids were puffy. About 7 o'clock in the evening he suddenly became unconscious, and had stertorous breathing, blowing respiration, and great oppression in the præcordial region, as evidenced by

palpitation and laboured breathing; the respirations were 34 per minute; pulse 120, compressible; temperature 104° Fahr. in the axilla; pupils dilated. The head was shaved, a blister applied to the nape, iced water on lint to the head, and ice was applied over the heart, which at once moderated its action and improved the pulse, which had become very feeble. A turpentine enema was administered, which brought away a large, black, fluid evacuation, very foetid, and which continued to flow from him at intervals for some half hour. Mustard plasters were applied to the calves of the legs; an attempt to give stimulants by the mouth failed, as he could not swallow. At 8.30 p.m. some frothy mucus tinged with blood oozed from the angles of the mouth, and a few minutes afterwards the characteristic black vomit appeared, being ejected with much violence, to the amount of about a pint. Turpentine stupes were now applied over the stomach; the pulse became feebler, and a peculiar odour was given off from the body and lungs. At 10.25 p.m. violent vomiting again commenced, the vomited matter was quite black, like black and clear coffee, and he was now bathed in a cold clammy perspiration, with a rapidly failing pulse. He died strongly convulsed in the course of the next five minutes, viz. at 10.30 p.m., just three hours and a half after the graver symptoms had commenced, and on the fourth day of the fever. This case towards its termination had very much the appearance of a case of heat apoplexy, such as I have often witnessed in the Red Sea, until the black vomit appeared, and I have never seen black vomit in heat apoplexy; some authors consider it a form of remittent fever. This man had passed no water since the morning, and the bladder seemed empty at death; his urine had been free from albumen previously. No post-mortem examination was allowed to be made in this case, as the ship was in the tropics, and it was thought there might be a danger of spreading the infection, or, if the disease did spread afterwards, it might be put down to the "*sectio cadaveris*." But I examined the vomit; Nessler's test showed ammonia to be present. The reaction was slightly acid. Magnified

600 diameters there were seen: epithelium scales broken up; white corpuscles which were much in excess of the red blood corpuscles, in the proportion of about four to one; the red ones were not arranged in rouleaux, but were either coalesced irregularly, or distributed as single corpuscles. The colourless bodies were of two sizes, the smaller bodies being evidently free nuclei, becoming disengaged from broken-up corpuscles; the red corpuscles seemed to be more generally broken up and decomposed than the white ones. There were also seen a number of bodies very closely resembling spermatozoa or microscopic worms, but there was no motion in them at the time of examination, twelve hours after death. There were no vibriones or other forms of either animal or vegetable life present in the vomit. As this was the only case during the epidemic that suffered from genuine black vomit I had no further opportunity of examining it.

Between May 29th and June 9th eight fresh cases of fever occurred, with similar symptoms to the previous ones; four of these, being mild cases, were sent to duty after from two to thirteen days' treatment; the other four cases were, however, of a much graver description; three of these suffered from violent retching and bilious vomiting; the vomited matter, at first white or yellow, became afterwards very dark green—almost black. The vomited matters were all of slightly acid reaction.

Seeing the turn matters were taking I thought it advisable to recommend that the ship should go at once to sea and proceed northwards, so as to get a temperature of 60° or 50° Fahr. if possible, the temperature of the air where we then were at the island of Nassau being 84° Fahr. The *Doris* was at once ordered to proceed to Halifax, and left for that northern port the same day. Directly we got well out to sea, with a fresh and cool breeze blowing, the fever cases began to improve, the vomiting became less urgent and gradually stopped, remedies were of greater service, and the temperature of the air lowered.

Up to June 13th, however, eleven fresh cases happened

while we were at sea ; they were, however, milder than the previous ones, six of them being sent to duty after three or four days' treatment. After this date no fresh cases occurred, and when the ship arrived at Halifax on June 18th only nine cases remained under treatment, and these were all convalescing, the temperature in the axilla in some still rising every night to 100° and 101° Fahr. They were sent to hospital at Halifax for further treatment, as it was considered advisable to get them out of the ship.

We had had a gale of wind blowing us along for several days past, and the air temperature had fallen to 49° Fahr. This is a temperature in which it is simply impossible for yellow fever, whether malarious or specific, to exist.

There were twenty-two cases in all during this outbreak, and only one death.

The following is a statement of the dates of the occurrence and duration of the attacks, with the results of treatment :

TABLE of Cases of Malarious Yellow Fever and Remittent Fever occurring on board H.M.S. Doris, 1873.

Date of exposure to malarious influences.	Date of attack.	No. of cases.	Convalescent and sent to hospital.	Well, sent to duty.	Died.	No. of days under treatment.
From May 14th to May 28th, 1873, at Port Royal and Kingston, Jamaica.	1873					
	May 28	1	1	...	...	22
	" 29	1	...	...	1	4
	" "	1	1	...	...	21
	June 2	1	...	1	...	13
	" "	1	...	1	...	5
	" 4	1	...	1	...	2
	" "	1	1	...	...	15
	" 6	1	1	...	...	13
	" 7	1	...	1	...	8
	" 8	1	1	...	...	11
	" 9	1	1	...	...	10
	" 11	1	1	...	...	8
	" "	1	...	1	...	4
	" 12	1	1	...	...	7
	" "	1	...	1	...	3
	" "	1	...	1	...	3
	" "	1	...	1	...	3
	" "	1	...	1	...	3
	" 13	1	1	...	...	6
	" "	1	...	1	...	5
	" "	1	...	1	...	5
	Totals.....	22	9	12	1	

With regard to the temperature of the cases of malarious yellow fever that came under my observation during this epidemic, in the milder cases the temperature was raised 1° to 2° , but in the more severe as much as 6° or 7° above the normal. It was by no means invariably higher at night than in the morning.

In the case of C. J. R.— the temperature nearly every night was 101° to 103° , falling every morning to 99° or 98° , after the first five days, up to the sixteenth day, when he was sent to hospital.

But in most of the cases the temperature was higher in the morning than it was in the evening; this was more especially the case during the first seven days.

In the case of James S— the evening temperature was 96° to 98.4° , the morning 103° to 104° , for the first six days, after this it became normal.

Daniel McT— had a temperature of 103° on the first morning, it was normal the same evening; the next morning it was up as high as 105° , and down to 100° in the evening of the same day; on the third day it was 104.2° in the morning and 98.4° in the evening; on the fourth day the morning temperature was 103.8° , the evening 98° ; from the sixth to the eleventh, when he was sent to hospital, the morning and evening temperatures fell a little below normal.

I consider this epidemic to have been of the malarious yellow fever type, that is to say, a remittent form of fever; and although only one case actually had black vomit, some of the others were bordering very closely upon it. The patients when first attacked were generally seized somewhat suddenly with fainting, præcordial oppression, hurried breathing, epigastric pain, giddiness, and nausea, the temperature being from 1° to 3° Fahr. above the normal, and in some of the more severe cases as much as 6° or 7° Fahr. above the normal. A hot stage followed, and in some cases lasted two or three days without the least sign of a remission.

Before we left Nassau for the north the cases were of the sthenic form, but after we got to sea the fresh cases were decidedly asthenic in their nature, the last cases being much milder than the preceding ones; nevertheless, they had all of them giddiness, muscular debility, and epigastric pain, with about 2° elevation of temperature, and a feeble pulse.

The urine was neither suppressed, nor was it albuminous in any of the cases, nor did it contain blood; it was somewhat scanty and high coloured; the specific gravity normal.

The fever was of the continued type, the first three or four days, afterwards in some cases it assumed the quotidian type, in others the tertian, and in others, again, an irregular remittent; a reference to the temperature chart (p. 51) will show this.

“There are many grades of intensity in remittent fever

(varying as it does from a severe intermittent to malarious yellow fever)."—*Aitken*.

Some of the cases were attacked in the morning and others in the evening. The period of convalescence required, and received, close attention with regard to diet, &c; and the speedy and complete removal from malarious influences, together with a much colder climate, I feel certain operated favourably in enabling the system the better to assimilate food, &c., and the sooner to eliminate the malarious poison; perhaps cutting short the attack of fever in some cases, and most certainly assisting materially the stage of convalescence.

The treatment generally pursued was this—in the first instance an emetic was given, afterwards a purge; on the following day, if the bowels were confined, a turpentine enema was administered, and turpentine was given by the mouth; sometimes a blue pill was ordered; sinapisms were applied to the epigastrium, the hair was cut close or shaved, and ice was applied to the head. After a few days quinine in full doses was invariably given. The diet was of the blandest until convalescence was established, when the patients were allowed some chicken, puddings, &c. A liberal allowance of port wine formed part of the diet. For drink they had iced lemonade, barley water, and iced tea, and the cold tea was much better tolerated than any other fluid, where vomiting was at all troublesome, and it was preferred by the sick. Acid drinks were neither tolerated well nor liked.

Aitken says, "When an observer has seen only the milder form of 'marsh remittent fever,' and is then suddenly called upon to witness an attack of 'malarious yellow fever,' he may well believe that the affections are entirely distinct." And, again, the same authority says, "The diagnosis between the 'specific contagious yellow fever' and the malarious form of yellow fever is at all times difficult; and severe 'marsh fevers' in certain geographical limits have a close resemblance to contagious yellow fever."