R E P O R T
OF
TWENTY CASES
OF
M A L I G N A N T C H O L E R A

**THAT OCCURRED IN THE SEAMEN'S HOSPITAL-SHIP,
DREADNOUGHT*,
BETWEEN THE 8TH AND 28TH OF OCTOBER, 1837.**

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AND

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TO THE DREADNOUGHT.

READ DECEMBER 14TH, 1837.

THE person in whom the disease first shewed itself was A. J. Bernet, aged 18, who was admitted on the 29th of September, the day of his arrival from Dantzic, on account of a lacerated wound of the scalp. On the third of October he became feverish, and on the following day, erysipelas appeared about the wound; it continued to spread until the 8th, when it occupied the whole of the hairy scalp. He was confined to his bed, and was on low diet.

* H. M. S. Dreadnought, three decker, is converted into a hospital for seamen in the port of London, and moored off Greenwich.

In the night of the 8th, was seized with cholera, of which he died, at eight P.M. on the 11th.

The second person attacked was Michael Wisdell, 25, a strong muscular man, who was admitted on the 5th of October, 14 days after his arrival from Quebec, on account of venereal sores and bubo. His treatment had been local, his general health was good on the 9th, and he was on ordinary diet. At 3 A.M. on the 10th, he was seized with vomiting and purging of bilious matter, with very severe cramps in the abdomen and limbs. The evacuations towards the evening were liquid and white, with flocculi. The urine was suppressed; there was deafness, loss of voice, vertigo; the surface became cold, and the features collapsed. The vomiting continued twenty-four hours. In the morning of the 11th, the evacuations were again bilious, and at 10 P.M. he passed some urine for the first time since his attack. Diarrhœa continued two or three days, during which his pulse was intermittent, and he was discharged on the 19th, well.

The 3d and 4th cases occurred in the nights of the 10th and 13th. The fifth case was that of James Thomas, 21, a strong, florid, healthy looking man, who was admitted on the 2d of October, ten days after his arrival from Dantzic, with chancres and bubo. His treatment was local, and he was on ordinary diet. General health unimpaired up to the 14th of October; in the evening of that day diarrhœa occurred, and occasional vomiting; he made no com-

plaint until the next morning, when cramps supervened. The matters ejected were not kept.

October 15th. 9 A.M. Surface generally blue and cold ; tongue and breath cold ; pulse scarcely perceptible ; complains of frequent vomiting and purging, and cramps ; pulse more developed after a warm bath.

10½ A.M. Lying with eyes closed ; lips very livid, skin of the fingers shrivelled ; cramps in the hands and arms ; constant jactitation ; tongue less cold ; voice not weak ; pulse 120, just perceptible : complains of headache, and a sensation as if his ears were stopped. Matters vomited are yellowish and bitter.

2½ P.M. Surface generally very cold : lips, nose, and tongue blue ; pulse imperceptible ; occasional cramps in the abdomen ; vomiting has ceased ; diarrhoea continues ; stools liquid, colourless, with white flocculi in suspension.

The vomiting did not recur ; the stools became less frequent, and at 7½ P.M. is the following note—four stools since 6 P.M., colourless with flocculi ; pulse felt in the right arm, which is under the bed-clothes, but not in the left, which is exposed. Pain in the region of the liver and nowhere else. (Treatment, large doses of calomel and stimulants.)

He rapidly sunk ; at 9 P.M. pulse imperceptible ; at 11 P.M., violent cramps in the neck and throat ; at 11½ P.M. he died. No urine from the time of attack.

Case 6th. George Abbs, 18 ; in port of London

from Richebucto, since the 22d of August. Admitted on the 16th of September, with periostitis and impetiginous eruption. Ordinary diet.

Was nearly well on the 14th of October, and his general health good. About 4 A.M. on the 15th, was seized with vomiting and purging. At 8 A.M., cold perspiration and dizziness, with partial deafness; about 9 A.M. violent cramps supervened, which were confined to the lower extremities. At this time, lips and countenance blue; tongue livid, whitish on the upper surface, moist, not cold; pulse 108, scarcely perceptible; matters vomited reported colourless, and insipid; has passed some urine in the morning.

2½ P.M. Cramps extended to the abdominal and thoracic muscles; surface much colder; pulse less distinct; no vomiting; a constant flow of liquid from the intestines, with brownish flocculi in suspension.

The stage of collapse was progressive; the vomiting and cramps remitted occasionally. At 9 A.M. on the 16th, is the following note.—Skin blue and cold; no pulse; vomits every thing he takes; diarrhœa profuse; stools characteristic of cholera. The calomel, of which he had taken large doses from the beginning, rejected from the stomach enveloped in viscid mucus, but otherwise unaltered.

In the course of the day, there was a slight return of pulse at the wrist, and the surface was not quite so cold; evacuations thicker and resembling gruel; a sensation of heat, though his surface was cold. Frequent and painful cramps.

At 9 A.M. on the 17th, he was cold, blue, and without pulse at the wrist; half comatose; eyes suffused; no vomiting or purging for some time past; no urine for 48 hours; refuses all food. At 1 P.M. he died.

It would be tedious to give the details of any more cases, as the preceding are sufficient to shew the identity of the disease with cholera, as it appeared in London, in 1832. We shall content ourselves, therefore, by presenting a tabular view of the remaining cases, and by mentioning the following circumstances, which, from their illustrating the history of the disease, seem to deserve notice.

In the 7th case, the evacuations, after having consisted, during several hours, of the whitish or gruelly fluid, said to be characteristic of the disease, assumed a peculiar character; although still profuse, they became brown or blackish, from the suspension in the colourless liquid of brown or black flocculi, sufficiently numerous to impart their colour to the whole mass. When poured on a filter, a colourless fluid transuded, and the brown or black flocculi remained on the paper.

In the 8th case, the dejections, continuing in other respects characteristic, were observed to become brownish at a later period of the disease; they consisted of a thick red fluid.

Evacuations of a similar character were noticed in cases 6 and 13. In all, they appeared after a prolonged continuance of the rice-water discharges, and seemed to owe their colour to the elimination,

through the intestines, of the red particles of the blood*.

It will be seen from the tables, that these cases offer examples of cholera occurring in conjunction with each of the following diseases: typhoid fever, acute and chronic rheumatism, erysipelas, ague, dysentery, syphilis, and gonorrhœa.

(During former epidemics of cholera, the disease has occurred in the Dreadnought in persons affected with fever, cynanche tonsillaris, rheumatism, scurvy, and diabetes mellitus. In the subject of the last mentioned disease, the urine, which, before the attack of cholera, was highly saccharine and enormous in quantity, was as completely suppressed as in the others. This man remained in the ship a fortnight after his recovery from cholera; at the end of this time, the inordinate secretion of urine had not returned.)

The 4th and 16th cases were interesting, as shewing the influence of cholera on the rheumatic affection. The subject of the 4th case, was labouring under rheumatic fever of a severe form. On the 13th was totally unable to move his legs; both knees were much swelled, presenting an evident sense of fluctuation, and were protected by a cradle. At one P.M., on the 14th, 13 hours from the attack of cholera, it was noted that he was in a state of jactitation, and

* Evacuations presenting the same appearance have been noticed by Dr. Graves, of Dublin, who, in a lecture recently published in the Medical Gazette, ascribes their colour to the acetate of lead which he administered to his patients.

moved his legs freely ; that the swelling of the right knee had quite subsided, and that of the left diminished. On the 16th, the swelling of both knees quite subsided, the pain in them ceased, and no traces of the rheumatic affection left. The knee joints were examined after death, and found to contain no fluid, but small shreds of white false membrane adherent to the synovial surface. The subject of the 16th case was admitted on the 19th of October, on account of a rheumatic affection of the joints, which had continued for ten weeks, during the last four of which he had been unable to walk, and had, in consequence, been confined to his hammock. At the time of his admission, was unable to walk, to extend his legs, or to clench his fist ; complained of pain in the limbs, worse at night ; there was tenderness, principally confined to the joints. In the night of the 21st, was attacked with cholera. On the 23d could move his legs freely, with scarcely any pain. On the 4th of November, was walking about the wards, presenting very slight traces of his rheumatic affection.

The following points of his former history are also interesting. He stated that he had twice previously been affected with cholera at Calcutta, that he was attacked, for the first time, while on board his ship, and subsequently conveyed to the hospital, on the 17th of May, 1831, two days after his arrival at Calcutta ; for the second time in July, 1833, three weeks after his arrival at the same port ; that each of these attacks was more violent than the present, (the

vomiting, purging, and cramps more severe,) and that in each he was treated by violent rubbings, brandy, and opium. This man recovered, and during his convalescence was several times questioned respecting the circumstances of these attacks, of which he always gave us the same account.

The 17th case, the one most rapidly fatal, occurred in a negro, a native of Congo.

Mortality.—We have already said that the number of cases was 20 ; of these, 12 proved fatal ; but there was a remarkable variation in the mortality. Thus, of the 10 persons first attacked, 8 died, while of the remaining 10 cases, 4 only proved fatal. The number of these cases is, perhaps, too small to justify us in drawing any conclusions from this circumstance. It may, however, be remarked, that it is confirmatory of an opinion sanctioned by previous experience, that epidemics are milder and less fatal towards their conclusion ; especially, as this variation in the mortality cannot be ascribed to any difference in the treatment adopted, or in the previous condition of the patients.

Treatment.—The treatment, in most of the cases, consisted in a bleeding at the commencement, when practicable ; in the administration of large and frequently repeated doses of calomel ; and, during the cold stage, in attempts to restore the temperature of the surface and alleviate the cramps, by means of frictions, hot-air baths, &c. The general result is unsatisfactory, and is rendered still more so by an inspection of the table, which discloses the humiliating

fact, that one half of the recoveries took place in cases comparatively mild.

Pathology.—The bodies were carefully examined after death in 11 of the 12 fatal cases; in all with the exception of case 9. The following is a summary of the appearances which they presented.

The only circumstances noticed in their external condition were rigidity and a violet colour of the back—the rigidity being generally greater, and the intensity of the violet colour less, as the bodies were examined nearer the epoch of death.

Organs of Digestion.—The appearance of the external or peritoneal surface of the stomach and small intestines varied, as the patients died at a period more or less remote from the attack. In the cases most rapidly fatal, or during the stage of collapse, they were observed to be viscid, and of a pale rose colour externally. The viscosity became less remarkable or disappeared, and the rose colour was replaced by their ordinary grey tint, in those cases that proved fatal after decided reaction. The large intestines were grey externally in every case.

The mucous membrane of the œsophagus was vascular in its lower portion in case 8 alone; in all the others, pale and healthy; studded with enlarged flat mucous follicles in its lower third in 17 cases; presenting a slight enlargement of the follicles in its upper part in 11.

The stomach was generally large; its mucous membrane pale in three cases, (7, 14, 16,) in the

others, presenting a greater or less degree of redness, which could be seen to depend on the injection of very minute vessels on its free surface, either in the splenic or pyloric extremity, or both. Its consistence was carefully examined in all the cases, and in none presented any remarkable change ; it appeared, however, to be softer than natural in the splenic extremity in 1, 3, 8, 11.

In most cases it was more or less mammellated, this appearance being either general, or confined to the pyloric extremity. In 7, 14, by drawing the coats of the stomach between the finger and thumb, and using some pressure, a milky fluid was made to exude, and the mammellated appearance destroyed; the mucous membrane of the portion so treated afterwards appearing smooth, and of normal thickness and consistence. This was not the case in 17; the mammellated appearance could not be destroyed, nor any fluid expressed. In this case, the mucous membrane was coated with very viscid, firmly adherent mucus, but there was none adhering to it in 7, 14.

The general contents were similar to those evacuated during life, and require no particular notice; there were some adherent patches of mucus, in which calomel was entangled, in 5; a few ounces of thick, grey mucus, not adherent, in 16; an universal coating of viscid, adherent mucus, in portions of which calomel was enveloped, in 17.

The condition of the duodenum was not noted in 1, 3, 4.

Its mucous membrane was vascular in 5, 8 ; pale in 6, 14 ; greyish in 7, 8, 17 ; this greyness resulting from minute black specks at the apices of the villi.

Nothing unusual was observed in its texture, excepting in some cases, perhaps, a greater friability than natural.

In every case in which it was examined, solitary glands were very conspicuous, giving the membrane more or less of a granular aspect : these were in all cases more numerous near the pylorus, and in none extending into the jejunum.

In 14, the villi of a white colour were remarkably distinct, and, on pressure between the fingers, yielded a milky fluid.

The orifice of the biliary duct was observed to be unusually prominent in 5, 6.

The mucous membrane of the small intestines was pale throughout in 3, 7, 14 ; but there was generally increased vascularity, giving rise, in some cases, to a purple colour, in portions here and there, especially near the termination of the ileum. It was observed to be grey from minute black specks in 7, 8, 17 ; this greyness was general in 7, 8, confined to the jejunum and upper part of the ileum in 17. It will be remembered that, in 7, 8, the discharges during life contained brownish or black flocculi.

In case 11, in the lower portion of the ileum, the mucous membrane was generally softened, and presented seven or eight small ulcerations, which probably resulted from the typhoid affection of which this man

was the subject. In the other cases, the texture of the mucous membrane had undergone no appreciable change.

The glands of Peyer were remarkably developed in all the cases, and the most so generally in those that proved fatal rapidly, or during the stage of collapse. They were of the same colour as the surrounding membrane, but in two cases, (6, 8,) in which this colour was red, the tint of the patches was observed to be deeper. When pale, they were in all cases dotted with black points. The glands of Brunner were observed, in every case, in the lower portion of the ileum, as small elevated beads, of the same colour as the membrane. These, as well as the glands of Peyer, were the most developed in the cases that proved rapidly fatal, and in all these sufficiently so to give a sensation of roughness to the finger passed over the membrane.

The contents of the small intestines were found tinged with bile in none of the cases that proved fatal within thirty-six hours, but more or less so, with one exception, (case 8,) in all those that were more protracted. This tint was confined to the jejunum in 3, 6; to the ileum in 7. They were brownish in the jejunum in 7, 8; of a plum colour, evidently from the admixture of blood in the ileum, in 8.

In most cases, the mucous membrane was more or less coated by a pasty substance.

The mucous membrane of the large intestine was, in most cases, pale throughout; observed to be red-

dened from vascularity in some of the protracted cases only (1, 8, 11). This redness was confined to the first portion of the intestine in 1, 11; general in 8, but more intense in patches, and on the surface of these patches were streaks of effused blood.

Conspicuous follicles were observed in the large intestine in all the cases, with one exception, case 16. They occurred as flat, slightly elevated circles, about a line in diameter, with a central black speck, and, in every case, diminished in number, and were less conspicuous as we receded from the cæcum.

One small ulceration was found in the cæcum, in 11; and, in 14, in the transverse and descending colons, there were many, none of them larger than the surface of a split pea, most of them much smaller, with smooth edges, and apparently in process of cicatrization. The ulceration in the former case was probably the result of the typhoid affection; those in the latter of the dysentery, of which these patients were respectively the subjects.

The cæcum and ascending colon were generally distended; this was not the case with the descending colon, which, in several of the examinations, was observed to be contracted.

The mesenteric glands were enlarged in almost every case; in some, they were purplish, in others, pale.

The liver presented nothing remarkable. The gall-bladder was distended with dark bile, in every

case, with the exception of 3, in which it contained pus, and presented numerous ulcerations of its mucous membrane.

The spleen was of natural size or smaller than usual, and firm in 1, 3, 5, 6, 7, 8, 16; of a light red colour in 5, 7, 8, 16; its colour not noticed in 1, 3, 6. It was unusually large in three cases only, 11, 14, 17; soft and dark-coloured in 11; soft, and contained a purple creamy fluid, which could be expressed, leaving a white spongy substance in 14; firm and dark-coloured in 17.

The appearances noticed in these three cases seem to depend on causes foreign to cholera: the subject of the 11th case was affected with typhus, of the 14th with ague, and that of the 17th was a native of the western coast of Africa.

Organs of respiration.—The condition of the lungs varied as the patients died more or less remotely from the attack. They were found healthy, or simply congested, in four of five cases that proved fatal within thirty-six hours; while of six cases, in which the patients lived at least forty-five hours after the attack, four presented pneumonia. In one of these (8), fatal at the end of forty-five hours, the pneumonia was very partial, interlobular, and confined to the lower lobe of the right lung; in two, (4, 7,) fatal at the end of 96 and 138 hours respectively, the lower lobes of *both* lungs were found in a state of red hepatisation. In all these cases, the pneumonia was latent; there were no symptoms indicating its presence, and, while the patients lived,

we had no suspicion of its existence. We were not aware at the time these patients were treated, that the same observation had been made by Mr. Jackson, in his Report of Cholera in Paris, in 1832. By him, pneumonia was found to exist in one half of the cases that proved fatal after reaction, and in all these, it was latent. This is unquestionably, as Mr. Jackson remarks, the most important fact, with reference to practice, that dissection has as yet disclosed, and shows us the necessity of investigating by auscultation the condition of the lungs in all cases in which reaction has been established.

With the exception of old adhesions, there was no affection of the pleura in any case.

Heart. There was a small quantity of serum in the pericardium in two cases only, those the most rapidly fatal (14, 17).

The muscular substance of the heart was generally flabby and purplish, and in two protracted cases (4, 8,) it presented ecchymosed spots on its surface.

The contents of the ventricles were noted in ten cases. There were fibrinous clots in the left ventricle in two cases only, and those protracted (4, 8); in the right ventricle, in 3, 4, 5, 8, 14, 17.

In 4, the clot was firmer, and in 8, larger in the right ventricle than in the left. In all the other cases, the cavities contained a greater or less quantity of dark fluid, or grumous blood, which had communicated no stain to the lining membrane.

The kidneys were observed in every case, and in none presented any thing unusual in size or texture.

The cortical substance was purplish throughout, or pale, and presenting dark congested vessels in most of the cases. In all, with one exception, (case 6,) a white, puriform fluid could be expressed from the mamillary point. The urinary bladder was empty and contracted in all those who died during the stage of collapse; it contained a small quantity of urine in some of the others.

The head was examined in six cases (1, 5, 6, 7, 8, 14). In 1, 6, nothing remarkable was observed; in 5, 8, the vessels of the dura mater and of the hemispheres were congested, the cortical substance of the brain unusually dark coloured. In 8, the surface of the brain was viscid; in 14, there was a considerable serous effusion under the arachnoid, and in the sheath of the spinal chord. In 7, no vascularity of the dura mater; the surface of the brain exsanguineous, the cortical substance not darker than natural; on the inferior surface of the left anterior lobe, were two slight depressions on the surface of the brain, the largest having the area of a sixpence, both coated by a yellowish transparent substance, and apparently the result of old sanguineous effusions.

Besides these cases of decided cholera, three cases occurred in the medical ward of violent vomiting and purging, which continued some hours and then ceased, without having assumed any characteristic appearance, or without being attended by any considerable collapse. A great number of other patients became affected with diarrhoea, during the same period. Mention is made of this in the notes of the

medical ward in seven cases, but it occurred in a much greater number, and from our attention being concentrated on severer cases, was not noted. Similar circumstances were observed in the surgical wards. They are probably attributable to the influence that produced cholera, and serve, perhaps, to shew that this influence was more general than would be imagined, from the number of cases in which unequivocal symptoms of this disease were manifested.

This view is confirmed by pathological considerations. The intestinal canal was carefully examined in every person who died in the ship during the prevalence of cholera, and in several who owed their death to various diseases, and who, during life, had manifested no symptoms of cholera, an unusual development of the intestinal glands was noticed. It would occupy too much space to enter into the details of these cases; we proceed at once, therefore, to the consideration of the causes of the disease.

Causes. The disease cannot be attributed *solely* to any general atmospheric condition, for the following reasons.

1st. All the cases occurred in persons previously in the ship, in a population of about 200, while not a single case was admitted from the ships in the river, in a population fifty times as great, sending nearly all their sick to the Dreadnought.

2d. Not a case occurred on board the Marine Society's ship, the *Iphigenia*, moored at the stern of the Dreadnought, and consequently subject to the same general atmospheric influences. The population of

the *Iphigenia* is 107, of whom 100 are boys, whose average age is about 15, all healthy subjects. When sufficiently ill to require constant attendance, they are sent to the *Dreadnought*. This immunity may be partly owing to age, especially as it was observed, when the disease prevailed in 1832, that children were attacked less frequently than adults. This cannot, however, be the sole cause, as the subject of the ninth case was only 18, little above the average age of the boys of the *Iphigenia*. It is worthy of notice that during the epidemic in 1832, when cases of cholera occurred in almost all the vessels in the river, the *Iphigenia* enjoyed the same immunity. We can only account for this from the favourable hygienic conditions of youth, good food, and clothing, regular exercise, free ventilation, and complete separation of the sick.

3d. No case, that we can learn, has occurred in Greenwich Hospital, subject to nearly the same general atmospheric influences, in a population of 2,700 pensioners, between the ages of 50 and 80, besides officers and servants. The same cause of exemption does not hold here, as the disease was observed, in former epidemics, to be both more frequent and more fatal in old persons.

We must, then, seek for the immediate cause among the circumstances peculiar to the *Dreadnought*.

1st. *Infection from foreign ports.* If the disease was brought by any of those who experienced it, it was most probably by Bernet, in whom it first shewed itself. He left Dantzic on the 8th of

September, and no case of cholera occurred in the vessel in which he sailed ; so that, on this supposition, the disease, in him, must have had a period of incubation of thirty days, a circumstance very improbable if we consider that the second and third cases occurred in the two following nights ; that the five persons seized on the 21st and 22d had come from the four quarters of the globe, and consequently could not have brought the disease, and at the time of their attack had been in the ship from two to seven days only ; and that the whole duration of the visitation was only nineteen days.

The only other person of those affected by the disease, who can be supposed to have introduced it, is Thomas, the fifth attacked. He also came from Dantzic, but he arrived in port seven days before Bernet, and had been in the hospital twelve days at the time of his attack.

It may be supposed possible for the disease to have been brought by a person who did not himself experience it. This is rendered less probable by the measures that are always taken with respect to the clothes of the patients. These, as soon as the patients have reached the beds allotted to them, are taken by the nurses and delivered to the boatswain, who keeps them in large lockers appropriated to this purpose under the fore-castle, and returns them to the patients on their discharge.

The following is, however, the evidence on this head. From the 1st of September to the 12th of October, were admitted 334 patients. Of these, 158

came from English and Irish ports, 98 from ports beyond Europe, and 78 from European, including Mediterranean ports. We have carefully examined all the latter, and have included in the following table the names of the most suspicious persons,—the port from which they last sailed,—the number of days since their arrival in this country, and their diseases.

Date of Admission.	Name.	Port sailed from.	How long in port before admission.	Disease.
			Days.	
Sept. 26	J. Stokes ..	Hamburgh .	1	Venereal.
— 27	J. Reis	Memel	3	Orchitis.
Oct. 4	J. Aiken ..	Hamburgh .	1	Fever.
— 7	J. Archer ..	Rotterdam .	3	Bubo.
— —	J. Grigg ..	Dantzic....	8	Fever.
— 9	W. Bryan..	Hamburgh .	3	Gonorrhœa.

In the latter end of August and the early part of September, cholera was prevalent at Berlin; and, by enquiries made through the mercantile house to which the ship that brought Bernet was consigned, we have learned that some cases occurred about the same time at Dantzic; but they were too few in number to excite attention, and the Prussian consul in London received no information respecting them.

2d. *Infection from one person to another in the ship.*

The two following circumstances afford, perhaps, the strongest argument against this mode of propagation.

1. None of the nurses or medical men were at-

tacked; the latter lived on board, and were constantly employed in attending these patients, and in making the examinations after death, about each of which a considerable time was spent, and which were conducted in the lowest part of the ship, in a small cabin in which all the bodies were deposited.

2. The disease was not propagated from the Dreadnought. During its prevalence there, patients were almost daily discharged, who immediately entered other ships in the river, but did not in a single instance communicate the disease to their crews.

The remaining evidence on this point is best expressed by the accompanying tables*, one of which represents the three decks, with the position of the bed occupied by each patient at the time of his attack; the other, the day and hour in which this attack took place.

It appears from these tables,

1°. That 1 case occurred in the convalescent or spar deck.

3 in the upper deck.

8 in the lower or middle deck.

7 in the orlop or lowest.

The remaining case was that of the boatswain, whose cabin is under the forecastle.

Now, on the 12th of October, there were 60 patients in the upper deck, the one appropriated to surgical cases; 54 in the middle, or medical deck; and 58 in the orlop deck, in which are placed patients that require the least attention.

* See the end of the Paper.

The disease then, although the first case occurred on the upper deck, prevailed most in the middle and orlop decks.

2°. That the first case occurred in the upper, the second in the orlop, or lowest deck, and the third in the middle deck; and that only three cases occurred in the upper deck, in which the disease first shewed itself, and these in the nights of the 8th, 15th, and 16th.

3°. That all the patients, with the exception of one, the date of whose attack was not well marked, were seized in the night, reckoning as such the time from 5 P.M. to 7 A.M. In this interval the attacks seemed pretty evenly distributed, equal numbers (6, 6) happening before and after midnight; the date of the others some time in the night not specified.

Giving the above definition of the night, the cases were distributed as follows :

1	in the night of the	8th.	
1	.....	9th.	
1	.....	10th.	
1	.....	13th.	
2	.....	14th.	
5	.....	15th.	
1	.....	16th.	
1	.....	17th.	
3	.....	21st.	
2	.....	22d.	{ The precise time of attack of one of these not specified.
1	.....	23d.	
1	.....	27th.	

Since the night of the 27th, no fresh cases have occurred.

Thus it appears that there were two active periods of the disease, the nights of the 14th and 15th, and those of the 21st and 22d. In these nights nearly two-thirds of the cases happened. In the first of these periods, five out of seven cases occurred in the orlop deck ; in the second, all occurred in the middle deck.

The preceding facts are not very favourable to the supposition that the disease was brought from abroad, or propagated by contagion in the ship. The influence on which it depended seemed to act with an intensity variable, but generally greater in the lower decks ; and, in almost all cases, its effects were first manifested during the night.

We proceed to examine some other circumstances which may be supposed to have conduced to the greater prevalence of the disease in the lower decks.

Ventilation.—As this is effected principally through the port-holes, it is most efficient in summer, when these can be kept open and a current of fresh air allowed to pass through the ship. Now, during the fortnight which preceded the appearance of cholera, the weather had been remarkably fine and mild, and the ventilation of the ship in consequence as good or better than it usually is at that season. With respect to the relative ventilation of the different decks, it is unquestionably, from its position and the smallness of the port-holes, less perfect in the lowest or orlop deck. The only advantage which the upper has over the middle deck consists in its greater elevation.

Crowding.—The patients are always, from the

number requiring admission, more crowded than it is perhaps desirable they should be, but, at the time when the disease broke out they were not unusually so. The number of patients on the 13th of October was 181, greater by 27 than at the corresponding time last year, but considerably less than the number frequently on board, and, as we have already seen, they were pretty evenly distributed in the three decks, which do not materially differ in size.

Condition of the Hold.—On the 21st of October, two extra labourers, two or three men from the ship, and the quarter-masters in rotation, in all seven or eight persons, were employed to pump out the bilge water and to clean the hold, a process which occupied them nearly a fortnight. Fires were lighted there, and the hold, as well as the decks, has since been whitewashed. The bilge water was in the condition in which it is usually found; a candle lowered into the well burnt clearly, and nothing was discovered in the condition of the hold that could in any way account for the disease. The boatswain, however, who superintended this process and slept under the forecastle, was attacked in the night of the 23d. All the labourers escaped; their hours of work were from six in the morning to six in the evening.

Predisposing Causes.—The food of the patients had evidently no share in the production of the disease. Of those attacked,

1 was on full diet.

11 were on ordinary or half diet.

2 were on milk diet.

2 milk diet with arrow root.

3 low diet.

The scale of diet is more liberal than those of the London hospitals, in consideration of the habits of sailors, whose daily consumption of food is much greater than that of the lower classes in the metropolis.

Previous Disease.—Five out of eight cases in the medical ward occurred in persons previously affected with diarrhoea. This was not the case in the other wards. Six of those attacked were in the hospital or slight venereal affections.

Previous condition as to force.—The disease did not attack the debilitated principally. This will be seen by reference to the cases; but it appears also from the circumstance that it was prevalent in the orlop deck, which is tenanted by the most robust patients. But, although the previous condition as to force seems to have had no influence on the frequency of the disease, it had a marked one on the mortality. This was greatest and the most rapidly fatal cases happened in the medical ward, where cholera generally occurred as a complication of some visceral disease, and in patients previously reduced in strength.

Previous Medical Constitution of the Ship.—From a review of all the cases admitted into the medical ward throughout the summer, it appears—

1. That the number of admissions into that ward has been nearly uniform, except in the month of July,

in which it was considerably less than in the other months.

2. That typhoid fever has been almost uniformly prevalent. Most of these patients were remarkably spotted, and the affection was of the type described by Huxham as jail fever. They were all admitted labouring under the disease. In no case did the disease shew itself in persons previously in the ward for other complaints, although this happened to two patients in the surgical wards.

3. That acute affections of the intestines, which were rare in the months of May, June, and July, became frequent in those of August and September. Under this head are comprehended cases of enteritis, or simple fever with diarrhoea, and common diarrhoea; and, for the month of August, four cases of cholera, two of which proved fatal.

The first of the fatal cases occurred in Edward Bowen, 50, negro, who was admitted, in a state of collapse, on the 5th of August, 14 days after his arrival from the Isle of France. He died at 7 in the morning following his admission. No account is preserved of the condition of the intestines.

The second of the fatal cases was that of Peter Johnstone, 61, who was admitted on the 12th of August, 14 days after his arrival from Leith. He was seized in the night of the 10th, and died in the night after his admission. We should be occupying too much space by entering into the details of this case, and shall merely remark that it seems impossible to distinguish it from those that have recently occurred

in the Dreadnought, or to consider it essentially different. The symptoms during life—the nature of the evacuations, which were without bile—the appearances after death ; but especially the unusual development of the agminated and isolated glands in the ileum, occurring, too, in a person of his age, are sufficient to establish their identity.

The two remaining cases were slight, and the patients did not present the symptoms of *malignant* cholera. The 1st of these was J. Austin, 22, admitted on the 8th of August, 14 days after his arrival from Sierra Leone; the 2nd, J. Aplin, 21, admitted on the 29th of August, 7 days after his arrival from Weymouth.

All these patients were admitted labouring under the disease.

In the month of September no case of cholera occurred, but a case, which, from its resemblance to some noticed by Dr. Roupell, as having preceded the cholera in 1832, is perhaps worthy of being mentioned. It is that of

Simon Sturrock, 46, a remarkably robust man, from Arbroath, and in the port of London since the 7th of September. He was quite well up to the 13th, when, at 1 P. M., he was seized with purging, which was succeeded by vomiting, cramps, urgent thirst. The purging, at first excessive, ceased at 4 A. M. on the 14th, but vomiting, with occasional hic-cough, continued to the 20th, the day of his death, when he gradually sank, after passing a considerable quantity of blood by stool ; no purging immediately

preceded this occurrence. We have omitted, for the sake of brevity, the details of this case, which resembled one of malignant cholera in the violence of some of the abdominal symptoms, and in its fatal issue; but the aspect of the patient, the character of the evacuations, the dark crimson velvety appearance of the mucous membrane of the last foot of the ileum, and of the ascending and transverse colon, noticed after death, and the absence of conspicuous intestinal glands were, we imagine, sufficient to shew that it was of a nature essentially different.

In all former visitations, cholera prevailed in London as well as in the river; in the one that forms the subject of this paper, it existed in an almost isolated manner, in the Dreadnought. About the same time, there are said to have been five or six cases at Limehouse, and we have been informed by Dr. Sims that a few cases occurred in the St. Mary-le-bone Infirmary; but we cannot learn that the disease existed in any other part of the metropolis. It is singular that when cholera first shewed itself in London in 1832, within a few days of its appearance in the river and at Limehouse, and before other parts of London were infected, some cases occurred in Mary-lebone, the part of the metropolis most removed from, and maintaining the least intercourse with, the former places.

It is worthy of remark, that during the summer of 1837, cholera prevailed extensively in Italy; and that, following the law of its first diffusion, it had been marching towards us for several months, appear-

ing in succession at Naples, Rome, and Berlin, before it shewed itself in the port of London.

RECAPITULATION.

1st. The disease, which recently prevailed in the Dreadnought, was identical with cholera, as it appeared in London in 1832; and, although it occurred in an almost isolated manner, and had no power of spreading, the individual cases were as severe as in former and more extensive epidemics.

2d. Cholera may affect persons labouring under various diseases, acute and chronic, and may attack the same person twice or more; circumstances in which it seems to differ from typhus, which rarely occurs in complication, or more than once in the same individual.

3d. The evacuations in cholera, which are ordinarily composed chiefly of the serous portion of the blood, occasionally contain, when the cold stage is protracted, the red particles.

4th. During the prevalence of cholera, diarrhœas, attended in some cases with vomiting, were frequent in the Dreadnought, and probably resulted from the cause that produced cholera.

5th. The recoveries took place chiefly in robust subjects, and in cases comparatively mild; but debility, although rendering the disease more fatal, did not seem to predispose to its attacks.

6th. The dissections in these cases confirm the important observation of Mr. Jackson, with respect to

the frequency of pneumonia, and the latent form in which it exists, in cases that prove fatal after reaction.

7th. As no case occurred on board the *Iphigenia*, moored at the stern of the *Dreadnought*, or in Greenwich Hospital, or in other vessels in the river, the disease cannot be attributed *solely* to any general atmospheric influences; but no obvious local cause could be assigned for it either in the crowding or ventilation of the *Dreadnought*, the diet of the patients, the condition of the hold, or the previous medical constitution of the ship.

8th. The shortness of the interval between the occurrence of the 1st case and that of the 2nd and 3rd; the circumstance that persons, recently arrived from various and distant countries, were attacked within a few days after their admission into the *Dreadnought*; but, especially, the short duration of the epidemics, are unfavourable to the supposition that the disease admits of a long period of incubation. The last circumstance, the short duration of the epidemic, is, we conceive, of great force, as it shews that of all persons attacked during the epidemic, after the first, not one presented a long period of incubation.

9th. The circumstance that none of the nurses or medical attendants of the *Dreadnought* were attacked; that the disease was not propagated from the ship, although patients were almost daily discharged, who immediately entered other vessels in the river; the order in which the cases occurred, the 1st, in the upper deck, in the night of the 8th, the 2d, in the lowest deck, in the night of the 9th, the 3rd, in the

middle deck, in the night of the 10th, and the disappearance of the disease at the end of three weeks, although no measures of seclusion, with respect to these patients, were taken, militate against the idea of its contagious nature.

10th. We can scarcely infer that the disease was brought from abroad, without admitting it to be contagious, and that it had, in the person who brought it, a period of incubation of, at least, 30 days, which is extremely improbable if we consider that this, at any rate, is a circumstance of very rare occurrence, and that only a few cases happened at Dantzic, the port from which this person last sailed.

11th. The history of the disease in Europe, in 1837, presents an epitome of that in 1832 ; its gradual advance towards this country probably depended on the same or similar influences in both cases.

TABULAR VIEW OF THE CIRCUMSTANCES OF ATTACK.

No.	Port last sailed from.	How long in port before admission.	How long in ship bef. attacked.	Date of attack.	Hour of attack.	Deck.	Bed.
1	Dantzic.	Same day.	10 days. {	Nov. 8	In thenight	Upper.	2
2	Quebec.	14 days.	4—5	10	3 A.M.	Orlop.	134
3	Newcastle.	1 day.	19	10	Evening.	Lower.	87
4	.....	Many months	4—5	13	12 P.M.	Lower.	69
5	Dantzic.	10 days.	12	14	Night.	Orlop.	127
6	Richebuctoo.	25 days.	30	15	4 A.M.	Orlop.	126
7	Black Sea.	.....	15	15	Evening.	Orlop.	149
8	Honduras.	16 days.	12	15	Evening.	Orlop.	146
9	Bangor.	Same day.	9	15	Night.	Lower.	97
10	Bristol.	3 weeks.	16	15	Night.	Upper.	26
11	Petersburg.	1 day.	17	16	Morning.	Convalescent; transf. to lower	87
12	Malta.	.....	54	17	5 A.M.	Upper.	9
13	Petersburg.	6 days.	20	17	Night.	Orlop.	173
14	N. Orleans.	Same day.	7	21	6 A.M.	Lower.	103
15	Calcutta.	—	2—3	21	8 P.M.	Lower.	73
16	Seaham.	7 days.	4—5	22	3 A.M.	Lower.	76
17	Rio Pongo.	14 days.	3	22	5 P.M.	Lower.	66
18	N. Orleans.	Same day.	7	22	.....	Lower.	99
19	.....	.....	12 years.	23	Evening.	Private Cabin.	..
20	Hamburg.	5 days.	5 days.	27	Night.	Orlop.	..

TABULAR VIEW OF THE CASES.

No.	Age.	Disease when attacked.	Condition as to force when attacked.	Diet when attacked.	Circumstances of the Cases.	Result.
1	18	Erysipelas from injury.	Confined to his bed.	Low.	Soon fell into a state of collapse, in which he lingered till the time of his death.	Death, 68 hours after attack.
2	25	Venereal sores.	Good.	Ordinary.	Attack sudden; evacuations bilious for many hours; then choleric; cramps very severe; no urine for 43 hours after attack.	Recovery; convalescence rapid.
3	18	Admitted on account of hematemesis.	Walking about in seeming convalescence.	Ordinary.	Attack sudden; evacuations bilious for many hours; then choleric; no cramps; did not rally from the stage of collapse. Gall bladder found extensively ulcerated, containing pus, but no calculi.	Death, 33 hours after attack.
4	22	Acute rheumatism.	In a state of fever.	Low.	Attack sudden; symptoms severe; early collapse; at the end of 48 hours, reaction established; evacuations again bilious; afterwards, in a semicomatose state, with occasional muttering; pulse 72-80; skin warm; eruption of minute papulae on the forehead.	Death, 96 hours after attack.
5	21	Venereal sores.	Robust.	Ordinary.	Did not rally from the stage of collapse; symptoms severe; no urine from the time of attack.	Death, 24 hours after attack.
6	18	Trifling.	Good.	Ordinary.	Attack sudden; symptoms severe; at the end of 10 hours, stools contained brownish flocculi; at the end of 34 hours, slight and transient reaction; no urine for 48 hours.	Death, 57 hours after attack.
7	20	Gonorrhea.	Good.	Ordinary.	Extreme collapse; at the end of 50 hours, purging ceased; vomiting excessive; matters ejected enormous in quantity, and containing blackish flocculi. This continued for 40 hours. At the end of 60 hours, reaction established; afterwards in a semicomatose state; skin warm; pulse 90, full; pupils contracted. Had two fits, one 12, the other 36 hours before death. No urine for 4 days after attack, when 3vj were drawn off.	Death, 138 hours after attack.
8	31	Venereal sores.	Robust.	Ordinary.	Symptoms severe; great collapse; at the end of 18 hours, slight and transient reaction; flocculi in the stools brownish; at the end of 34 hours, stools scanty, consisting of a thick red fluid.	Death, 45 hours after attack.

No.	Age.	Disease when attacked.	Condition as to force when attacked.	Diet when attacked.	Circumstances of the Cases.	Result.
9	15	Diarrhea.	Very thin & delicate.	Milk.	Soon fell into a state of collapse, in which he lingered till the time of his death.	Death, 45 hours after attack.
10	48	Lacer ^d wound of the hand.	Good.	Ordinary.	Dejections choleric; no vomiting or cramps; collapse slight; reaction early.	Recovery; convalescence rapid.
11	18	Gonorrhea; rigors, followed by diarr. and fever 3 days bef. attack.	Good before accession of fever.	.....	Vomiting and purging, without cramps; evacuations choleric; collapse slight, and of short duration; afterwards, aspect typhoid; tongue, dry and brown; teeth, sordid; skin, hot and dry; occasional delirium; pulse 120.	Death, 8 days after attack.
12	17	Burn.	Good.	Ordinary.	Great collapse; reaction at the end of 14 hours.	Recov.; conv. rapid.
13	19	Veneral sores.	Good.	Ordinary.	Great collapse; cramps severe; reaction after 22 hours; after 24 hours, evacuations brownish from dark flocculi, scanty at the end of 36 hours; evacuations bilious.	Recovery.
14	20	Ague, dysentery	Very feeble.	Milk, arr. rt.	Fell very rapidly into collapse.	Death, 8 hrs. aft. att.
15	32	Chronic rheumatism.	No visceral disease.	Milk.	Previous constipation—attack sudden; urine not entirely suppressed; other symptoms severe; reaction at the end of 36 hours.	Recovery; convalescence uninterrupted.
16	58	Convalesc ^d from jaund. with diarr.	Feeble.	Ordinary.	Urine not quite suppressed; did not rally from the stage of collapse.	Death, 24 hours after attack.
17	20	Diarrhea.	Good.	Milk.	Symptoms extremely violent; cramps excessively severe; great jactitation; rapid collapse.	Death, 7 hours after attack.
18	19	Ague.	Feeble.	Milk and arrowroot.	Previous diarrhea for two or three days; no vomiting or cramps; dejections very frequent, and choleric for some hours; slight collapse; afterwards diarrhea for some days.	Recovery.
19	45	None.	Robust.	.....	Previous diarrhea for 36 hours; cramps severe; complete suppression of urine; other symptoms mild; slight collapse; occasional bilious vomiting, and diarrhea, with loss of appetite for several months.	Recovery.
20	18	Swelled testicle.	Good.	Ordinary.	Attack sudden; collapse moderate; reaction at end of 20 hours; afterwards occasional diarrhea and bilious vomiting, for a fortnight.	Recovery.

TABULAR VIEW OF THE DECKS.

A A, B B, the gangways: C C C, the main hatchway, the only entrance into the hold from the orlop deck: D D, two cabins for female nurses.

The short lines represent the fourfold row of beds in the several decks; those to which numerals are affixed, the beds in which the cases respectively occurred.

The beds on the starboard side of the orlop deck were unoccupied during the prevalence of cholera.