

NOTES ON BERI-BERI AT FALMOUTH.

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OWING to the amount of attention that has been directed to beri-beri, chiefly through the Norwegian Government and the Royal Arsenical Commission in England, a few notes which I have collected for the latter may be of interest to others.

The accompanying Table A shows the number of vessels arriving at Falmouth with beri-beri, and by comparing these figures with

VESSELS ARRIVING AT THE PORT OF FALMOUTH WITH BERI-BERI.

TABLE A.

	British.	Danish.	Russian.	German.	Swedish.	Norwegian.	Italian.	American.	Total.
During 1896*	1	—	—	1	—	5	—	—	7
„ 1897*	1	—	—	—	—	4	—	—	5
„ 1898*	—	1	—	1	—	3	1	—	6
„ 1899*	—	—	—	—	—	3	—	1	4
„ 1900	1	1	1	2	2	9	—	—	16
„ 1901	—	—	—	—	1	4	—	—	5
Total	3	2	1	4	3	28	1	1	43
Cases received at Royal Cornwall Sailors' Home during the years 1897-1900	—	4	—	11	—	48	3	2	68

* During these years the boarding was not extended to every vessel, and probably many slight cases were not boarded by the sanitary authority.

those in Table B (total arrivals), it will be seen that no less than 65 per cent. were Norwegians, 9 per cent. Germans, 7 per cent. British and Swedes.

It thus appears fairly evident that Norwegian sailors are, for some reason or other, more prone to the disease than seamen of other nations, or that they are more exposed to the contagion or predisposing causes, be they what they may. I might mention that the disease occurs more often on board sailing-ships than steamers. Not one of the cases above mentioned occurred on board steamers.

The reasons may be :

1. Steamers make quicker passages.

2. They visit ports of call oftener, and so get fresh provisions oftener.

3. As a rule they are larger vessels, better found and constructed.

Taking Norwegian ships as a group, I, from personal observation, am prepared to state that they are

1. In a worse sanitary condition.
2. Oftenest undermanned.
3. Worst fed and found.
4. Oftenest carry deck cargoes.
5. Oftenest carry wood cargoes.
6. Smallest vessels that go long voyages.
7. Worst regulated scale of diet.

SANITATION.

Speaking broadly, I should say that the sanitary condition of German vessels was the best, closely followed by British, French, and Americans. Some lines of Britishers are, I fear, very poor. Another point bearing largely on the question is the way the crew are found; by this I mean the general comfort of the men and their clothing. Norwegians and British fare very badly in this respect. Hundreds of sailors that I have inspected simply have the clothes they stand in, which they have to wear wet or fine, and few have any bedding except, perhaps, a straw mattress, often no blankets. That this is their own fault goes without saying, as, when in port, they will sell everything they can lay hands on for drink, or, when handed over by the crimps at San Francisco or other ports, they find themselves on a new vessel in an impoverished condition.

Taking the statistics of vessels arriving here for the last three years (Table B), it will be clearly seen that the German ships are the largest, and are increasing in size every year. Some of these vessels are really all that the most fastidious could require. The English ships follow very closely, and our larger vessels compare more than favourably with the larger Germans; but it is the small fry that let our standard down so badly. French and Italian ships are generally in a fair sanitary condition, and the men are always well clothed and cared for, and bear that appearance. Although the Norwegian ships are increasing in size, their sanitary condition does not seem to improve accordingly; there is always an air of poverty, and they are little trouble to the Customs, seldom having anything for seal. The whole arrangements for a voyage seem cut down to the hour, and if they are a few weeks overdue owing to contrary winds, then it becomes most apparent.

Many of the small ships have no closets, except, perhaps, one aft; this, I think, is very wise, as the forecandle closets that one generally sees are the filthiest and dirtiest that could well be imagined. They are (or supposed to be) flushed as a rule by

TABLE B.

	Nationality.	Arrivals for 1899.			Arrivals for 1900.			Arrivals for 1901.			Average based on Three Years.
		No. of Ships.	Total Tonnage.	Average Tonnage.	No. of Ships.	Total Tonnage.	Average Tonnage.	No. of Ships.	Total Tonnage.	Average Tonnage.	
1	British	351	407,824	1232.09	345	463,039	1342.14	394	528,346	1340.98	1304.67
2	Norwegian	136	74,533	546.56	143	92,098	644.04	108	62,850	581.94	590.84
3	German	105	159,215	1516.33	86	132,847	1545.17	90	141,108	1567.86	1507.78
4	Italian	37	28,936	728.06	35	30,241	864.02	35	30,241	866.88	816.31
5	French	25	24,416	976.64	32	40,444	1262.61	16	18,176	1136.00	1125.08
6	Russian	9	6,438	715.33	24	15,632	651.33	26	22,370	850.41	705.59
7	Swedish	29	12,642	435.93	20	15,231	761.55	17	8,990	528.82	575.43
8	Dutch	3	3,501	437.62	17	7,670	451.17	13	9,444	726.46	535.08
9	Danish	31	12,912	416.83	37	12,594	340.37	34	20,364	598.94	452.04

dipping the water up from over the side in a bucket; this, of course, is a trouble, and therefore seldom done.

Bilge Water.—The larger ships are generally careful over this matter, but the smaller ones are not. I boarded a small British barque only a few days ago, and the captain told me the bilges

ANALYSES OF BILGE WATER.

TABLE C.

	1	2	3	4
Colour	Black as ink	Dark red	Clear straw	Dark brown.
Turbidity	Turbid	Turbid	Not turbid	Turbid.
Deposit on evaporation	Copious, too black to see charring	Copious, charring deeply	Small amount, not charring	Fair amount, charring.
Odour	Strong	Very strong	Very slight	Strong.
Free ammonia	Traces	Abundant	Abundant	Traces.
Nitrite	Traces	Traces	Distinct traces	Traces.
Nitrate	About $\frac{1}{2}$ grain	About 0.1 grain	Not perceptible	About $\frac{1}{2}$ grain per gallon.
Metals	Iron present	None	Iron	None.
Oxygen absorbed in 15 minutes at 212° F.	4.8 grains per gallon	6.2 grains per gallon	3.5 grains per gallon	4.5 grains per gallon.

had not been pumped for five months, and I believe this to be correct. Captains will generally own to two or three months.

Of course, the chemical analysis of the bilge water would be affected by the cargo, and the four analyses in the table above are from vessels carrying wood. Many masters take great pride in keeping their bilges dry, because, they state, this keeps down the rats, which in wheat ships are a great pest, and carriers of disease. It would be a good thing if the bilges were not only pumped out once a week, or fortnight, but thoroughly disinfected and cleansed once a month.

The *forecastles* are generally very dirty, and look as if they were seldom cleaned; the men spit all about the place; the walls are generally hung with oilers, all which help to take up the none-too-great amount of air; the tables are dirty, greasy, and seldom cleaned.

Ventilation is practically nil, and the daylight the same.

The *illumination* is, as a rule, a small paraffin wick-lamp, which smells horribly. The ventilation, or what there is of it, is provided by two doors, which are left open, and the draft generally goes right through, and none circulates amongst the bunks. In dirty or cold weather these doors are closed—this is in the later build of ships which have deck-houses; but in the smaller and older ones the forecastles are often down below in the very bows of the ships, and these ships are frequently used for carrying bones or salted hides, and as the bulk-head is generally of 1-inch planking, the stench can more easily be imagined than described. The men themselves are seldom clean in their habits, and washing is looked on as a luxury; and having to scrub their own clothes, how often

they get it may be easily deduced. There seems to be a great prevailing opinion amongst captains that deck cargoes cause beri-beri. This, of course, may be related to the fact that such cargoes prevent the crew from taking exercise. How this is borne out in scurvy has been pointed out by observers over and over again.

DIET.

Owing to the many statements that have arisen as to various food-stuffs in relation to beri-beri, I have been most particular during the last two years to make a searching inquiry, but on Norwegian ships they all seem to feed about the same, so I will only enumerate a few as types :

A.

Sunday : Preserved meat, dough, and sweet soup.

Monday : Pea-soup, preserved vegetables, and salt beef.

Tuesday : Stock fish, tinned potatoes, and sweet soup.

Wednesday : Salt beef and tinned cabbage and fresh bread.

Thursday : Same as Sunday.

Friday : Pea or bean soup, salt vegetables, and pork.

Saturday : Stock fish and tinned potatoes, sweet soup.

B.

Sunday : Preserved meat and vegetables and fresh bread.

Monday :

Tuesday :

Wednesday :

} Salt beef or pork.

Thursday : Preserved meat and fresh bread.

Friday : Salt beef or pork.

Saturday : Tinned salmon for three months, then salt beef.

C.

Three days a week : Salt beef or pork and pea-soup.

Two days a week : Preserved meats, soup, and salt vegetables.

One day a week : Stock fish and sweet soup.

One day a week : Milk-soup (with rice) and fish-balls, or pickled fish.

D.

Three days a week : Preserved meat and salt vegetables.

Two days a week : Salt meat and salt vegetables.

One day a week : Stock fish and fresh bread.

One day a week : Fish-balls and soup.

The *sweet soup* consists of a sort of stewed apples or prunes. They always get bread with every meal,¹ but it generally is dried biscuit; these biscuits are particularly prone to become media for

micro-organisms, and it is seldom after a bread-tank has been opened for a few weeks that they remain wholesome. The tanks are very large, and take a long time to empty. Some firms pack their biscuits in barrels; these biscuits are nearly always found weevily or mouldy on opening. I believe the health of sailors would be better if legislation required the compulsory baking of bread twice a week. Flour seems to keep well in iron tanks. I have examined a good deal of it, and only in a few cases have I found it anything but in a quite satisfactory condition after as long as eighteen months' storage. Many vessels bake bread three days a week. These are vessels which generally are well found, and do not contribute the beri-beri which we meet with in Falmouth.

The *fish-balls* spoken of are boiled fish and potatoes mixed up into a ball about the size of a small apple, and tinned with some of the liquor they are boiled in; they smell very disagreeable even when a new tin is opened. They are manufactured chiefly in Sweden and Norway.

Preserved Meats.—Many captains attribute the disease to this. It is true there is no knowing the age or ingredients of such; they always look and smell good. Many captains have them re-boiled before use. Many of the tins I have tested for arsenic have given a sulphurous deposit, which in my opinion points to some chemical or bacterial decomposition, and I am inclined to believe that, used in the quantities they are, they cannot be wholesome.

Vegetables.—The potatoes are generally cut in thin slices and dried in some way. They appear brownish in colour, are very hard and brittle; when soaked they become white and soft, and are cooked for use. The vegetables are generally dried cabbage, or dried peas or beans; it is seldom one meets pickled onions or mixed pickles as we know them in England. The peas are generally dried, and the beans are haricot beans or a small brown bean.

Milk is apparently not much used in the fore-castle, the tea and coffee being drunk neat. I have never examined any of this milk either chemically or bacteriologically; it is nearly always the Swiss milk. It is used more freely by the officers, and whether there is any connection in this and the officers being more often affected than the crew remains to be proved.

Salt, pepper, and mustard are not largely used.

Vinegar is a condiment greatly sought for. It is, I should say, one of the most unstable products, as it varies so largely in its colour and acidity. I have analyzed a large number of samples roughly for arsenic by Reinsch's test and degree of acidity; a few are tabulated:

TABLE D.

Colour.	Arsenic by Reinsch's Test.	Copper.	Acidity.	Odour.	Appearance.
Light	No	No	3.51 %	Normal	Clear
Light	No	No	2.88 %	Faint	Clear
Dark	No	No	4 %	Strong	Thick
Dark	No	No	6.5 %	Strong	Very thick
Light	No	No	5.17 %	Normal	Very clear
Very dark	No	No	4.1 %	Strong	Very thick
Dark	No	No	7.13 %	Strong	Very thick
Light	No	No	3.5 %	Faint	Clear
Dark	No	No	6.58 %	Faint	Clear
Dark	No	No	5.92 %	Normal	Clear
Very dark	No	No	4.5 %	Very strong	Thick
Dark	No	No	7.5 %	Very strong	Very thick

Of course, these samples are drawn from all over the world after long bottling, and being subject to great variations of climate, etc.

A FEW LIME-JUICE SAMPLES ANALYZED IN 1901.

TABLE E.

Make.	When used.	Odour.	Arsenic by Reinsch's Test.	Appear- ance.	Acidity.	Beri- beri on Ship.	Remarks.
British	All the voyage	Strong	No	Thick	35 grs. per oz.	Yes	Very astringent taste
American	Only in tropics	Medium	No	Clear	Not tested	No	Sweet taste
British	All the voyage	Strong	No	Thick	26 grs. per oz.	No	Astringent taste
British	All the time at sea	Strong	No	Thick	14.94 grs. per oz.	No	Astringent taste
British	Ditto.	Very strong	No	Thick	30 grs. per oz.	No	Astringent taste
British	All the time	Strong	No	Thick	18.86 grs. per oz.	Yes	All the crew took it and are well; the captain did not take any and is bad
German	Only in tropics	Faint	No	Clear	Not tested	No	Sweet taste
British	All the time by captain, not by crew	Faint	No	Clear	Ditto.	Yes	Captain bad and two sailors
British	In tropics	Faint	No	Thick	20 grs. per oz.	No	Astringent
British	Only last two months	Very strong	No	Thick	30.5 grs. per oz.	No	Very astringent
British	All the voyage	Faint	No	Clear	19.15 grs. per oz.	No	Very astringent
German	Occasionally	Faint	No	Clear	Not tested	No	Sweet
British	All the time	Strong	No	Thick	Ditto.	No	Astringent
British	All the time	Strong	No	Thick	18.25 grs. per oz.	No	Astringent

It will thus be noticed that two of the five vessels which arrived here with beri-beri are not on this list; the reason is that one never used lime-juice, and the other had run short for six weeks; but the disease broke out before this period. Opinions differ as to the value of this fluid as a preventative against beri-beri. Personally, I believe as such it is useless.

Only two countries make its use compulsory—England and Germany—and yet their ships are not free from beri-beri; and although not obligatory, the Norwegians and Swedes use it freely. The French and Italians never use it, but substitute a red common drinking wine, and they may claim exemption from beri-beri more than England or Germany.

RICE.

The connection of this grain with beri-beri has been greatly insisted on, especially in Japan, but there is no proof as regards our Falmouth cases that it is related to the disease more than any other article of diet. It is used far less on board ships than in any English home, and when a ship starts a few pounds at most will be her complement; it is never eaten unless it is boiled, and then with other ingredients. On looking at the diet tables it will not be found figuring in more than one. I have made investigations as to the rice germ, and can fully bear out the statements of Major Rost as to the rice bacillus itself; but I cannot as yet find the same in the blood of sufferers, or anything like it, as he has done, but my investigations are not yet completed.

WATER.

It will be seen, on reference to Table F, that the water was boiled on four occasions throughout the whole voyage, two vessels only resorting to such measures after the illness had appeared. But nothing is said of the length of time the water was boiling, which might have a very important bearing on the destruction of spores. One class of micro-organisms which are credited with being the originators of beri-beri will withstand 212° F. for one hour, and I expect that it is seldom the water is subject to such a searching sterilization as this, and as long as it just boils is considered quite sufficient.

It must be remembered that this is not necessarily the standard of water that has been drunk all the voyage, as the rain-water was only added when they were running short, probably near the end of the voyage.

CONDITION OF WATER ON VESSELS ARRIVING WITH BERI-BERI IN
1900 AND 1901.

TABLE F.

	Water Boiled.	Unboiled.	Water Filtered.	Tanks.	Remarks.
1	While in port	Yes; at sea	No	Iron	
2	In port and tropics	Yes; at sea	No	Iron and wood	
3	Yes	—	Sometimes	Iron	Tanks cleansed and re-cemented before leaving. The two sick men both owned to stealing water from the tanks
4	No	Yes	No	Iron	
5	Yes	—	—	Iron and wood	
6	No	Yes	Seldom	Iron	
7	Yes	Yes	—	Iron	After sickness appeared
8	No	Yes	Yes	Iron	
9	No	Yes	Occasionally	Iron	
10	Yes	Yes	No	Iron	Only boiled after sickness appeared
11	No	No	Yes	Iron	
12	Yes	No	No	Iron	Most of the water was distilled
13	No	No	No	Iron	
14	Generally	Seldom	No	Iron	Had rain-water added; they occasionally drank on deck from the pumps
15	No	Yes	No	Iron	
16	Yes	No	Sometimes	Iron	
17	No	Yes	Always	Iron	Ran short and had rain-water added
18	Sometimes	Sometimes	No	Iron	
19	No	Yes	No	Iron	
20	No	Yes	Always	Iron	Tanks not cemented for two years
21	No	Yes	No	Iron	

Table G shows that most of these waters are far from what one could wish as drinking waters, none of them being samples that would be passed on shore—in fact, one of them has as much as 52 grains of chlorine per gallon; others, again, show signs of organic contamination in various degrees. One of them contained large quantities of iron, and, strange to say, most of the crew looked anæmic and complained of dyspepsia. Samples 3, 4, 5 contained large quantities of magnesia. Most of the tanks are constructed of iron and stored between decks; they never get a ray of light, and are not ventilated in any way. They are generally cement-washed every voyage, but often a ship will be away from eighteen months to three years before returning, and in that case no cement-washing

ANALYSIS OF WATER FROM FIVE SHIPS WITH BERI-BERI, 1901.

TABLE G.

Source of Pollution.	1 Long Storage, a Mixture of Per-nambuco and Risor, and Rain-water collected from Sails spread on Deck.	2 Long Storage.	3 Long-storage Rain-water, Dirty Tank, Leak from Deck into Tank	4 Long Storage.	5 Long-storage Rain-water collected from Deck.
Colour in 6-in. column	A decided rust-colour	Faint straw-colour	Brownish	Faintly bluish	Dirty white
Turbidity	Distinct	Perfectly clear	Lot of flocculent matter	Perfectly clear	Cloudy
Odour	Very faint	None	Faint	Very faint	Slight
Residue on evaporation	Abundant pink deposit; no charring	Small amount; charred deeply	Slight amount; no charring	Moderate amount; no charring	Abundant white; no charring
Free ammonia	Distinct	None	Slight trace	No appreciable trace	None
Chlorine	Not tested	11 grs. per gall., equivalent to 18.12 grs. common salt	52 grs. of chlorine equivalent to 85.6 grs. common salt	17 grs. of chlorine equivalent to 11.53 grs. common salt	25 grs. of chlorine
Nitrite	No trace	None	Faint	None	None
Nitrate	About $\frac{1}{2}$ gr. per gall.	None	Under 0.1 gr. nitrite per gall.	About 0.25 gr. per gall.	None
Hardness	Not tested	8 degrees	17 degrees	18 degrees	8 degrees
Lead	No trace	None	None	None	None
Zinc, iron, and copper	Iron, distinct traces	None	None	None	Iron present
Oxygen absorbed in 15 minutes at 212° F.	About 0.40 gr. per gall.	0.30 gr. per gall.	Record lost	40 grs. per gall.	0.20 gr. per gall.

would be done. Rain-water is a probable source of contamination, as it is drained off from the decks into the tanks, and if there is any sea running at the time is bound to become brackish. At many ports the water has to be brought long distances, and in some out-of-the-way places it is carried in open barges, or in barrels stored in boats, which would have no other means of locomotion than rowing for perhaps 100 miles; in some cases they are as much as from three to six days on the water trip. These boats are seldom cleaned or cared for in any way. In the few microscopic examinations I have made I have seen no organisms that have been associated with the disease, or that are not commonly found in water.

VESSELS ARRIVING AT FALMOUTH WITH BERI-BERI DURING 1901.

Owing to inquiries by the Arsenical Commission, I have gone into the relationship of arsenical poisoning and beri-beri, and from the following tables it will be seen that my investigations, so far as they have gone, have not shown any relationship. That arsenic has been found in the hair of beri-beri patients there is no doubt, but that it has or could be found in just such a proportion of healthy individuals has not yet been disproved. Owing to the few ships arriving with beri-beri, I have not been able to make the inquiries I should have liked.

TABLE H.

	Ships all Well ; no Disease.			Ships with Beri-beri.		
	Samples Examined.	Arsenic by Reinsch's Test.	Other Objectionable Ingredients.	Samples Examined.	Arsenic by Reinsch's Test.	Other Objectionable Ingredients.
Meat-tins	25	2 minute traces	5 sulphur	4	—	1 sulphur
Fish (stock)	15	—	—	2	—	—
Water	25	—	8 iron; none really good drinking-water	4	—	All 4 impure
Lime-juice	50	—	—	4	—	—
Whisky	15	—	—	4	—	—
Red wine	13	—	—	3	—	—
Brandy	15	—	—	4	—	—
Tinned meat	20	—	—	4	—	—
Rice	—	—	—	3	—	—
Total	178	2	13	32	—	5

In all instances in which I have tested for arsenic I have used the Reinsch test. I would only claim for this test that it would in all probability demonstrate arsenic if present in considerable quantity.

I have examined carefully all cases of beri-beri that have come under my notice for pigmentation, and only in one case have I seen any that might have been in any way termed pigmentation; but owing to the unwashed state of most, and their failing to have noticed any discolouration, it has been very hard to arrive at any conclusion at all. I have looked carefully for any eruption, and have failed to detect any that would lead one in any way to suspect arsenic as the cause. I find on referring to various authors that

there is a vast difference in the blood-counts of arsenical poisoning and beri-beri.

After making all allowance for the different reading of the instruments, there would still remain about 1,000,000 difference. The arsenic figures are after T. C. Muir, and the beri-beri after Pekelharing.

Again, the food is generally distributed on board ships after having been cooked all *en masse*, and they all drink water from the same tanks and the same lime-juice. How, then, would one account for one, two, or even only three being ill, as the whole crew being ill is the exception, and not the rule? The greatest amount of arsenic found in any beer during the outbreak in the North of England was $1\frac{1}{2}$ grains per gallon; allowing 20 pints a day, which would be an outside limit, a case would take $3\frac{3}{4}$ grains per day. Allowing arsenic to be as plentiful as this on board a ship, it would

TABLE I.

Duration of Disease at time of Count.	Average No. of Red Cells per 1 c.mm.	Average No. of Red Cells per 1 c.mm.
Up to 31 days	4,128,300 (4 cases)	5,550,000 (4 cases)
Over 31 days and up to 62 days ...	4,308,000 (1 case)	5,668,000 (4 cases)
Over 62 days and up to 100 days ...	4,982,000 (1 case)	7,200,000 (1 case)

be practically an impossibility for almost one even to escape, when we consider that they must all consume the same amount. Again, if the quantity were very minute, one man might be a heavier feeder than all his companions; but when we consider the small amount of arsenic he would consume more than his mess-mates, one would be sceptical in believing that it would affect him, so small would it be. I have examined five samples of beri-beri urine carefully for arsenic, and failed to find any which contain this mineral.

ANALYSIS OF DEATH-RATE.

These can only be collected from the returns of the Registrar of Merchant Shipping, and are no doubt incomplete. I take it that these returns are only a record of those seamen who die at sea, and are notified by the captains on their arrival in port, therefore many of the diagnoses are probably incorrect.

Of the 3,312 deaths that occurred during the year, 1,853 will be seen to be due to accident; this will therefore leave us with a total of 1,459 deaths due to disease. If we analyze these still further, it

DEATHS OF SEAMEN OF ALL NATIONALITIES REPORTED AT BRITISH PORTS, AND OF BRITISH SEAMEN AT FOREIGN PORTS.

RETURNS OF REGISTRAR OF MERCHANT SHIPPING.

1900.	Acci- dental.	Phthisis.	Other Pul- monary Diseases.	Beri- beri.	Cardiac.	Other Causes.	Nephritic.	Malaria.	Pneu- monia.	Unknown.	Other Con- tagions.	Dysentery.	Cholera.	Cerebral.	Yellow Fever.	Enteric.	Total.
January	127	24	1	8	18	16	3	7	13	29	2	7	5	2	1	6	267
February	148	12	7	2	16	20	1	8	14	19	4	5	3	0	—	5	263
March	253	6	3	3	17	10	2	10	12	15	—	3	—	2	6	1	343
April	198	12	16	4	16	18	3	4	—	19	7	9	1	5	5	10	329
May	220	16	4	8	25	12	1	3	18	12	11	3	3	2	2	5	345
June	78	18	6	5	12	18	6	4	12	26	3	6	2	9	5	12	222
July	135	11	1	5	34	19	—	4	8	16	6	8	8	18	2	9	280
August	123	16	—	3	26	12	5	8	10	31	6	7	—	—	—	6	253
September	132	13	3	5	15	20	1	3	9	5	3	7	—	2	2	6	226
October	109	9	4	7	22	11	2	8	9	3	4	2	5	—	—	6	201
November	157	10	7	5	26	22	4	4	7	21	4	6	3	1	1	3	283
December	173	14	3	5	20	22	1	4	3	27	6	3	3	3	3	10	300
Total	1,853	161	55	60	247	200	28	67	105	223	56	66	33	43	27	88	3,312

will be seen that 603 deaths are due to diseases clearly attributable to specific organisms, which it is scarcely necessary to point out are greatly influenced by insanitary surroundings. Beri-beri is not included in these, as its etiology is yet obscure.

The above infectious diseases contribute a death-rate of 42·76 per cent. of the total deaths from disease. It will also be seen that 4·31 per cent. of the same deaths is claimed by beri-beri.

A valuable point as regards the incidence of the disease on beri-beri ships arriving in Falmouth during the year 1900 is pointed out by Mr. Howard Fox. He states that out of sixteen ships arriving with beri-beri, no less than nine had their captains ill. Of the beri-beri vessels arriving here during the years 1896-99, 106 of the total crews of 295 (including captains) were affected. This would give 39·35 per cent. of the total as sick with beri-beri, thus showing a great difference to the incidence of the disease on the captains. If the sailors had been affected in the same proportion as the captains, it would mean that this disease would have rendered each vessel unworkable, which is an incident I only once remember having met, and that was on a ship affected with scurvy. I can find no numbers on which to base a calculation as to the other officers, but I believe that the captains, mates, carpenters, and cooks would show a very large majority of those affected with the disease. This may, perhaps, be due to their taking less exercise than the rest of the crew, who have the manual labour of working the ship.

Out of the 106 cases arriving during 1896-99, 18 deaths were reported, giving a death-rate of 16·98 per cent. of those actually stricken with the disease, and a death-rate of 6·1 per cent. of the crews on beri-beri ships.

PORT SANITARY AUTHORITIES.—In the House of Commons Mr. Long stated that representations have been made to him as to the issue of an order applying the Public Health and Local Government Conferences Act, 1885, to Port Sanitary Authorities. Legislation would, however, be necessary to enable him to issue an order for this purpose, and the point has been noted for consideration when an opportunity for legislation arises.

SHELL-FISH AND ENTERIC FEVER.—Dr. H. B. Mapleton, the Medical Officer of Health of the Newton Abbot district, warned the residents against the consumption of shell-fish taken from the river. He stated that during October three cases of enteric fever in Newton Abbot had been directly attributable to this cause. Dr. Nash of Southend-on-Sea, Dr. Robertson of Sheffield, Dr. Allan of Westminster, and Drs. Thresh and Wood (Essex County Council), have also made reference in reports to outbreaks of typhoid fever from similar causes.