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ON

SCURVY

IN THE

MERCANTILE MARINE.

BY

WALTER DICKSON, M.D., R.N.,

MEDICAL INSPECTOR OF H.M. CUSTOMS.

Read June 4th, 1866.

[*Reprinted from the TRANSACTIONS OF THE EPIDEMIOLOGICAL SOCIETY.*]

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ON SCURVY IN THE MERCANTILE MARINE.*

By WALTER DICKSON, M.D., R.N., Medical Inspector of Customs.

[Read June 4th, 1866.]

THE subject of scurvy in the merchant navy has of late excited a considerable amount of attention. It is surprising that, in the present state of our knowledge, a disease so easy of prevention and cure should exist at all. But that it should especially infest the ships of a country like England, placed in the foremost rank of maritime nations, is a lamentable fact unworthy of an age which boasts, and not without reason, of its enlightenment, philanthropy, and material progress.

I purpose in these observations to give some account of a series of investigations which I have been called on to make during the last two years by direction of the Board of Trade, with the view of ascertaining the origin of the disease in various ships which have arrived in the port of London, and in which cases of scurvy were either so flagrant or so numerous as to demand the notice of the Government.

The medical officer of the Privy Council had, in his Annual Report for 1863, given sea-scurvy a conspicuous place among preventable diseases requiring further State interference. At his request, Dr. Barnes, one of the physicians of the *Dreadnought* hospital ship, produced a valuable report, so complete and exhaustive, as to leave little to be desired. The records of that noble and truly catholic charity abounded with illustrations of the disorder in every degree of intensity, and there is probably no existing institution where it can be studied to such advantage. Dr. Budd, during his tenure of office as physician, had contributed the fruits of his experience in an elaborate and still standard treatise which was published about thirty years ago in the *Library of Medicine*. Indeed, it is to the medical officers and managers of the *Dreadnought* that the authori-

* Much of this paper has since appeared, under another form, in the "Lancet" of January, February, and March, 1867.

ties and the public are indebted for having the subject forced on their attention. Dr. S. Ward has contributed some most instructive clinical lectures on scurvy and other maladies incidental to seamen; and the present resident medical officer, Mr. Leach, has distinguished himself by his assiduous and zealous endeavours to expose existing abuses and to obtain justice for the helpless and friendless class of men who come under his care.

The most unsatisfactory feature in the recent history of scurvy is, that notwithstanding acknowledged improvements in the condition of seamen, the disease appears to have increased during the last fifteen years rather than diminished. The number of cases received on board the *Dreadnought* in that period has varied from 50 to 150 in the year, the mean number of admissions annually being about 90; and, as a rule, more numerous in the latter than in the earlier years of the period. The average proportion of scurvy to all other diseases and accidents received into the hospital has been 1 to 24, or 42 per 1000. Even in last quarter the cases admitted were 39, a large number as compared with corresponding quarters of 3 years, viz. 22, 20, and 15. At the other great sea-ports, the ratio has been equally high. At Liverpool, for example, in six years, 228 cases were received into the Southern Hospital. Taking other hospitals of that town into account, not less than 50 cases are annually treated at Liverpool. And in all these, it must be remembered, the scorbutic symptoms are of considerable intensity. The minor forms of the disease mostly escape professional notice, but they are notoriously very prevalent. At the Poplar Sailors' Home, according to Mr. Corner, one-half of the inmates are affected in some degree, and one-twentieth are seriously afflicted.

If we now turn to the scurvy-stricken ships, we shall find the proportion of sick among their crews to be often very large. In a list of 26 vessels given by Dr. Barnes the ratio is stated as ranging from 9 per cent. to 90 per cent. on the strength. The crews of these ships averaged 20 in number, and the mean proportion of cases of scurvy they yielded was 4, being at the rate of 20 per cent. In the vessels inspected by me the proportion of cases has been very similar, and, as in the others, chiefly occurred in ships from Liverpool, Sunderland, Glasgow, etc. It would seem, therefore, that our north country ports have an unenviable pre-eminence in this particular. The voyages most productive of scurvy are those from India and China, as might be ex-

pected from their length; for the disease seldom breaks out in less than 60 days, and the duration of the passage from the eastern ports varies, for the most part, from 90 to 150 days. Any gross defect in the diet of the crew will therefore show itself in an unequivocal manner in the last days or weeks of the homeward voyage.

The cause of scurvy is so well known, that it is unnecessary to discuss it. In whatever degree certain conditions of the individual, and certain kinds of aliment, may predispose to and hasten its manifestation, the disease is, in all cases, directly owing to the absence from the food for some time of fresh vegetable matter. The remedy is of the most obvious and simple kind, and, except in extreme or complicated cases, is invariably effectual. But (rare thing in our art), the preventive treatment is equally simple, easy of application, and infallible. In the systematic use of a wholesome and very agreeable beverage we have an undoubted specific, the efficacy of which has been amply tested in every sea and in every variety of climate. It is singular that this happy expedient of lime-juice, which in the last eighty years has saved so many thousand lives, and has helped, in no small degree, to build up our country's greatness, should have had to struggle into notice very slowly, and with much opposition. Woodall, a surgeon of London, in the year 1636, described its powers in terms as graphic as they are quaint:—

“I find we have many good things that heal the scurvy well on land, but the sea chirurgeon shall do little good at sea with them, neither will they endure. But the use of the juyce of lemmons is a precious medicine and well tried; being sound and good, let it have the chief place, for it will deserve it. It is to be taken each morning, two or three spoonfuls, and fast after it two hours; and if you add one spoonful of aqua vitæ thereto, to a cold stomach it is the better. Some chirurgeons also give of this juyce daily to the men in health, as a preservative, which course is good if they have store, otherwise it were best to keep it for need. I dare not write how good a sauce it is at meat lest the chief of the ship waste it in the great cabins to save vinegar.”—*Surgeon's Mate or Military and Domestic Medicine.*

Woodall's knowledge of lemon-juice was probably derived from an older time, yet it was more than a hundred years after his day before its antiscorbutic qualities were fully recognised, and it was enlisted as a most valuable ally in our greatest naval war.

It is still more singular that although employed with un-

failing advantage for the best part of a century in the royal and higher class mercantile marine, lemon-juice should still be unappreciated and rejected in so many quarters, and that even where it is used, its utility should so often be marred through ignorance and prejudice in regard to the details of its preservation and mode of issue. And yet these details are of so simple and obvious a character that it would seem almost a waste of time to dwell upon them. But we find in every day experience that it is from a want of knowledge of these apparently insignificant minutiae rather than from any wilful neglect or perversity of judgment, that an invaluable remedy has in some measure lost its reputation, and has even come to be doubted by those who are most interested in using it.

Some captains will attribute the disease to cold, as it most often makes its appearance when the vessel gets into the more northern latitudes, and when there is a considerable and rapid fall of temperature; some will ascribe it to debility or constitutional peculiarity of the individuals attacked; others will look on it as, in almost all cases, the manifestation of a syphilitic taint, while a few entertain the idea that when it once appears it is propagated by contagion—a weak person has at first been affected, and from him it has been communicated to the rest. Yet these officers are, in general, shrewd and intelligent men, and, although the tie betwixt them and their crews is of a comparatively slight and temporary kind, I believe that, with few exceptions, from motives both of expediency and humanity, they have the material well-being of the seamen at heart. Among the men there appears to be an equal divergence of opinion. Bad provisions, bad water, are most often alleged as conducing to it, and sometimes bad treatment. Unless the question is put directly to them, both officers and men agree in ignoring the real cause of the malady, viz., the absence of really good and efficient lime-juice, or irregularity and neglect either in issuing or consuming it. It may be broadly stated that in almost every case of the manifestation of scurvy the lemon-juice was proved to have been either originally spurious or to have become deteriorated by the faulty mode in which it was preserved; to have been issued carelessly or irregularly, or to have been systematically declined by those who should have drunk it. It not unfrequently happens that, from exposure to the air in a tropical climate, lime-juice has undergone decomposition, and become positively loathsome, and that the men are therefore

quite justified in refusing a draught which, besides being nauseous, is altogether useless.

There is also a so-called lime-juice, pleasant to the taste, and so closely resembling the genuine article both in chemical composition and flavour, as to be by the uninitiated almost undistinguishable. It is prepared artificially from citric acid, and is preferred by many captains as being much less liable to spoil than the true expressed juice of the fruit. Although extensively used, I believe this compound to be greatly deficient in curative or prophylactic virtues, if indeed it possess them in any degree whatever. To this plausible sophistication even more than to grosser adulterations may be chiefly attributed the ill repute into which lime-juice has of late most undeservedly fallen. I have found, in several instances, that the use of this artificial lime-juice did not prevent the outbreak of scurvy in a highly aggravated and even fatal form. There is reason to believe that reliance on it, and all similar compounds, is entirely misplaced, and that misconception on this point, and the erroneous practice thereby engendered, have been a fertile source of scorbutic disease. Indeed, it seems highly probable that this well-meant, but futile, endeavour to improve on the unimprovable has been an efficient factor in causing the very remarkable increase of scurvy in recent years.

In London and all the greater ports, lime-juice can be obtained in abundance at a reasonable price, and of perfectly satisfactory quality. There seems to be no doubt that the great majority of ships are supplied with a genuine article. But by a curious perversity of custom this perishable commodity, of such essential importance, is not treated with the care that would be bestowed on beer or wine, or other liquid of vegetable origin. In most of the vessels I have visited it has been stowed in bulk in a cask of considerable size (from fifteen to twenty gallons) supposed to last the whole voyage of ten or twelve months, without any spirit being added for its preservation, and opened at intervals of a week or two to allow of a quantity to be drawn off for use. Exposed in this manner to the air, crossing the equator four times, and agitated by the incessant motion of the ship, it is not surprising that it should lose most of its original properties. In truth, it is singular it should preserve any of them, and should not invariably undergo a change to the repulsive-looking liquid which in my inspections I have sometimes seen, and of which I now show you some specimens. But with due precaution lime-juice may be kept for

periods far exceeding the length of any modern commercial voyage with unimpaired efficacy. Although placed otherwise in most unfavourable circumstances, the second North Polar expedition, under Parry, did not suffer until they had been dependent on their ship resources for more than twenty-seven months, and in the latter expedition, under M'Clure, Dr. Armstrong informs us that a similar period elapsed without any sign of scurvy. So much was I impressed with this prime defect in many merchant ships, that at the very outset of these investigations I insisted strongly on an alteration in the mode of packing lime-juice.

The Board of Trade in some degree acted on this recommendation by causing a large number of copies of my report to be printed and sent to all the local marine boards at the various ports for general circulation. Time will show whether the advice has been generally followed. Some traders now supply it in one or two gallon jars, but even this, although a great improvement, is in my opinion too large a quantity for the purposes of a small crew; for it must be remembered that, in a voyage to India or China and back, the whole consumption will not exceed the rate of about one gallon per man, and that in the class of ship in which scurvy is found most to prevail, the daily consumption does not exceed half-a-pint for all hands.

Before the lime-juice is bottled it is essential to ascertain its quality. By an experienced person good lime-juice is easily recognised by the simple tests of taste, smell, and specific gravity; in cases of doubt a chemical analysis would be desirable. The specific gravity of true natural juice is always higher than the imitations. Mr. Leach has paid much attention to this subject. The results of ten good specimens gave a density ranging from 1030 to 1040, and showed a dark residue on being evaporated to dryness. The specimens of reprehensible quality showed a specific gravity from 1021 to 1026, and yielded hardly any residue; allowance must of course be made for spirit should it be added before the hydrometer is used. The proportion of mucilage and other organic matter in lime-juice is considerable. In a recent analysis made by Mr. Witt for Dr. Bence Jones, one ounce was found to contain less than two grains of inorganic matter (accurately 1.728 grains). Three-fourths of this small amount consisted of potash, in combination with sulphuric and carbonic acids; the remaining quarter of a grain was composed of phosphoric acid with soda and lime, and traces of silica, iron, and magnesia; the rest is made up

of water and citric acid, of which there are forty grains in a fluid ounce.

Several years ago Dr. Garrod ascribed great importance to the presence of potash in lime-juice and other anti-scorbutics. He announced that the disease depended on a deficiency of potash in the blood; that the diets which cause scurvy contain less than the proportion of potash necessary to health, and that the administration of potash alone was sufficient either to cure or prevent the disease. Nitrate of potash has been reputed by some a good anti-scorbutic, but the experience of the Royal Navy, and especially of Dr. Bryson and others in charge of convict ships, has led to the conclusion that it is comparatively useless or inert, if not injurious. From the remarks of Dr. Barnes, also, the value of this salt seems to be extremely doubtful, and he quotes a remarkable instance of scurvy having broken out to a great extent among a party of lumberers in Canada who were fed on pork salted freely with nitre, and to this circumstance, indeed, Dr. Grant, who described the cases, mainly ascribed the outbreak in question.

I perceive that the Dreadnought Society, in their preventive recommendations, suggest, in the absence of lime-juice, that five grains of the bicarbonate of potash should be given twice a day.

It appears to be at least doubtful whether the anti-scorbutic property of lime-juice is due to the presence singly, either of the large proportion of citric acid, or of the infinitesimal quantity of potash contained in it. May it not rather be the combination of both with the *organic* constituents, in a manner so subtle as to elude our present chemical knowledge, which is essential to its prophylactic power? We know that *that* power is fleeting, and must, in a longer or shorter time, disappear; yet the potash, on which so much stress has been laid, is one of the least perishable of its constituents.

The regular and sufficient issue of lime-juice to the crew is of paramount consequence, yet in most merchant ships it is the exception rather than the rule. It should be left less to the discretion of the men themselves, but should become an integral part of the discipline of the ship. I consider it more judicious to serve out lemon-juice in small quantities daily, than in larger quantity once or twice a week. The crew should be taught to regard it as essential a part of their daily food as meat or biscuit. Allowing for the long oceanic voyages ships now make without touching for refreshment, I would recom-

mend that, in the latter part of the voyage, the issue should be increased to one ounce per man, with an equal quantity of sugar or molasses, and a pint of water. The mixture should be made before dinner and served out to the crew under the superintendence of an officer, so that it should be drunk at their meal; some who now neglect it might thus be induced to take it with regularity, and even enjoy it. Sea-faring men are capricious, and in some minds there is a prejudice against it. In some ships of war I have seen this met by mixing the allowances of grog and lemon-juice together—a mild form of compulsion which was found to be effectual. At present the Act requires the juice to be issued when a vessel has been ten days at sea; this period might in most instances be shortened with advantage. I would recommend it be given simultaneously with the salt provisions without any delay, and even with fresh meat when, as sometimes happens, no green or succulent vegetables accompany it. For many years, and in very different parts of the world, I have been able to carry this practice into effect, and with success, not only in obviating scurvy, but also in warding off other maladies from which, through want of a salutary variety of diet, sea-faring persons are prone to suffer; such are dyspepsia, diarrhœa, and dysentery; ulcers, night blindness, and idiopathic debility, all of which there is reason to believe partake of the scorbutic type in some degree, although the more prominent and characteristic symptoms of scurvy are absent.

A wholesome and varied food, with a due proportion of fresh vegetable matter, should always be procurable in harbour, and with a little pains and foresight at sea also. No single article of diet can be persisted in for a long time. It is well established that with a purely fresh meat diet scurvy may occur, and indeed must occur, if vegetables are altogether withheld. The history of military operations, both ancient and modern, are full of illustrations. Salt provisions are negatively injurious, from their monotony and from their inferior power of nutrition, yet seamen are proverbially fond of them, and even when on shore continue to prefer salt and dried fish, ham, bacon, cheese, and the like.

As the time between their voyages is very short (frequently not exceeding a few days), they rarely have the opportunity of enjoying a mixed natural diet for a sufficiently long time to counteract the ill effects of their usual regimen; there is, therefore, the greater need not only of giving a more liberal supply of lime-juice, but of satisfying their wants with pre-

served meats and vegetables, in as varied succession as practicable, and in taking care that in port, and for some time after leaving port, they have free access to such green vegetables and fruits as the country produces. Some of these, as potatoes, yams, bananas, oranges and limes, will keep for some time. Great carelessness, or rather I should say culpable apathy and indifference, exists on this point to a degree that is hardly credible. Notwithstanding the high perfection to which the art of preserving various kinds of meat and all sorts of vegetables has attained, and their comparatively cheap rate of production, they hardly ever find a place in a ship's dietary. The aliment provided by agreement for the seamen of our day is in no respect different (except perhaps in quality) from that which his forefathers had a century ago. Salt beef and salt pork, flour, peas and biscuit, are still the only description of food which, in the vast majority of ships, is tolerated or enjoined by relentless and unreasoning custom. It is true the quality of these articles is for the most part faultless; quite equal in the vessels I have inspected to those furnished to Her Majesty's ships; yet it seems worse than an oversight that such welcome and inexpensive luxuries as preserved potatoes and other common vegetables, pickles, condiments, and dried fruits, should be habitually denied to merchant seamen. The emigrant and the convict are cared for by legislative enactment, and the man-of-war's-man, besides being more frequently in port, and having sufficient means to purchase for himself, is placed under a parental despotism whose duty and pride it is to protect, at whatever cost, his health and vigour.

Instances frequently occur in the merchant service of vessels lying in tropical ports for weeks without any regular issue of vegetables, and that even while fresh meat is withheld. The idea of procuring a supply for all hands of fish or fruit is never entertained even when these constitute the cheap and natural fare of the inhabitants of the place. Unimproved by their sojourn in harbour, they again put to sea on their return voyage; the lime-juice, as usually packed, is deteriorated; the beef, also, often begins to spoil; the other provisions continue to be good. The vessel has rounded the Cape of Good Hope before even the weaker men are smitten with scurvy; some have had climatic diseases in India or China, and been shipped perhaps from an hospital; some have been suffering from venereal affections, contracted in our vile sea-ports, when they first began their voyage;

others are young and not inured to hardship, with frames feeble and undeveloped. Of such material are the first subjects of attack. The symptoms are obscure, general malaise and muscular debility, with so little apparent derangement of the health or alteration of aspect as to give rise to the suspicion of malingering. But even if unmistakable signs of scurvy have been revealed, it too often happens that the vessel sights and runs past the Islands of St. Helena and Ascension without stopping. In this age of eager competition, such is the desire for quick passages and corresponding profit, that a ship master does not scruple to encounter the storms of the Bay of Biscay, and the intricate navigation of the channel with half his crew disabled by disease, and so he braves loss of life and cargo rather than brook the delay of a few hours and the expenditure of a few pounds, or it may be shillings, in procuring needful refreshments at those islands.

In corroboration of the well-known fact, authenticated in several of these inspections, that scurvy generally manifests itself in India ships about the time of doubling the Cape, I am informed through Mr. Leach that the admissions of very severe cases in the last five years into the St. Helena hospital, amount to no fewer than about thirty per annum, to say nothing of many more treated as out-patients, in whom the scorbutic symptoms were comparatively milder. The cases admitted were of such intensity that their average duration was thirty-five days, and they formed one-twelfth to one-fifteenth of the whole number of admissions into that institution.

Much stress has been laid, and no doubt justly, on the circumstance that the disease is unknown among the officers of the merchant navy; I have found in my experience some instances to the contrary. In that class of vessel, in which scurvy is most frequently met, and which seldom carry passengers, the ordinary daily fare of the officers differs but little, if at all, from that of the men. They probably take care to secure a few pickles and preserves, besides laying in some fresh fruit and vegetables before leaving harbour. But their immunity, I apprehend, is mainly owing to the habitual, although moderate use of stimulants, more especially in the fermented form, sometimes light wine, but chiefly bitter beer and porter.

The value of these as antiscorbutics was perfectly well known in the last century. Both wine and beer were at one time issued in the navy when practicable, as a regular

ration, and the medical officers of that time, who were keen and accurate observers, and were in truth the very founders of hygienic science, furnish ample evidence of their efficacy. The superiority in health of the great fleets which France sent forth in those days was often to be traced to their never having abandoned the use of fresh bread and of wine.

Lime-juice has practically superseded all other beverages for purely medicinal purposes, but it is a question how far a partial return to the occasional issue of beer or wine might not be advantageous. In very few merchant ships are spirits now allowed; tea and coffee are given, but they are too often of indifferent quality, and badly prepared. A wholesome weak alcoholic drink would hardly fail to be acceptable, and there is reason to believe would be beneficial to health.

I have seen in the Royal Navy good effects from the permitted purchase, under proper restrictions, of small quantities of bottled bitter beer. In operations of war in blockading an enemy's coast, our supplies of fresh provisions from the shore were sometimes cut off for long periods, and a slight indulgence of this sort was most welcome to our seamen. In the United States' Navy there was, and probably is, a practice of selling to the men at fixed and moderate prices a variety of little luxuries which, at choice, they might add to the standard dietary of the service. I think the practice by no means unreasonable, and some modification of it might be introduced with advantage into our merchant ships; even in the Royal Navy there is still, I believe, room for improvement in variety of food. Some years ago rations of preserved fresh meat were given twice or thrice a week, but through bad faith on the part of the contractors and other mismanagement the scheme failed. Much of the meat was no better than carrion, the seamen were disgusted, and, as some gentleman present may remember, public indignation was strongly roused. There seems no reason why the experiment should not in more favourable circumstances succeed. The preserved food furnished for our sick is of first-rate excellence, and is most liberally supplied at the discretion of the medical officers.

As anti-scorbutic articles of diet, the preserved vegetables would rank even higher than fish or meats. In the South Polar Expedition of 1844-45, of which I had medical charge, they were issued to the crew with great advantage, so also were pickles, and the dried American apples and peaches, on which the United States whalers set such store

in their prolonged and adventurous voyagings. Treacle is an anti-scorbutic of considerable value; it is much used by our transatlantic brethren, and very judiciously, in cooking pork. Mustard should be, as in the Royal Navy, a constant article of ships' diet. Vinegar, although an agreeable condiment, has no marked anti-scorbutic virtue; it, however, holds a prominent place in the Merchant Seamen's Act. It is ordered to be issued at the rate of half a pint per week for each individual. Vinegar and lime-juice form the only articles of diet secured by law to the merchant marine; all other articles of provision are simply a matter of agreement and private contract. I have had the opportunity of examining the printed articles of agreement of various sizes and classes of ships, but in the kind and quality of food there is little or no difference. Good water is indispensable to health; its direct bearing on scurvy, however, is not very marked. The Seamen's Hospital Society in their printed recommendations remark, that water obtained from a condensing apparatus is much inferior to fresh water, and chiefly from its deficiency in certain salts. I am here inclined to differ. No water can, in my opinion, be purer or in every way more wholesome than that properly distilled, provided it be exposed for a short time to the air and kept in perfectly clean iron tanks. It was only at the last meeting of this Society that I adduced some striking facts as to the value of condensed water as compared with the water of tidal rivers. I mentioned the singular exemption from cholera of ships which used distilled water when that disease was prevailing around them, and the circumstance that even while the disease had been imported from the shore it was not propagated or extended. But this is a digression. I can only repeat that, even if the anti-scorbutic properties of distilled water be feebler (and this to me appears doubtful), such loss is amply compensated for by its being far less likely to affect the bowels than the water generally procured by ships from the great rivers of India and China, even when, as is usual, that water has undergone some process of filtration.

Personal cleanliness is, I conceive, of considerable importance as a partial antidote to scurvy. Merchant seamen are sometimes inconceivably dirty, apathetic and indolent; they thereby sooner fall victims to this disease, more especially when, in their return voyage from the tropics, they come suddenly into the low temperature of our northern winter. Their vital energies are depressed to an alarming

or even fatal degree. Cases of this kind have come under my notice in the inspection of vessels which arrived in London in the last two winters.

In cold weather warm water should be allowed for washing. The crew should also be encouraged in exercise, games, or other amusements to beguile the time, as well as counteract the torpor induced by a tedious voyage, and what is to them an excessive degree of cold. The clothing of the men is often insufficient for the vicissitudes of climate which they have to undergo in rounding the Capes Horn and Good Hope, or in arriving in the European seas. Many of those who have embarked as new members of the crew at tropical ports, are utterly destitute of suitable warm clothing; there is no doubt that this defect gives freer access to the inroad and aggravation of scorbutic disease. Overcrowding and bad ventilation would no doubt be a powerful predisposing agent in the causation of scurvy, as has been amply proved by many examples in convict and emigrant and troop ships, and, to go back to an older time, in the Royal Navy. In few of the merchant ships of which I have had cognizance is any fault to be found on this score. The wretched old top-gallant forecastles, where those not on watch used to be huddled together like the lower animals, are now superseded in most instances that have come before me, by spacious deck-houses well lighted and well aired, and yielding better accommodation to their occupants than is to be found in many of Her Majesty's ships.*

The subject of discipline is foreign to our discussions in this Society, yet it is by no means irrelevant to the present question. I may be permitted to observe that considerable allowance must be made for the difficult position of the officers of the Merchant Navy. The crews of the lower class ships are now composed of the most heterogeneous materials, including foreigners of every nation; they are often turbulent and intractable, and the reins by which they are held to duty are slack. The efforts of commanders to maintain order are not always successful; their treatment of the men is sometimes capricious, if not harsh, and occasionally degenerates into heartless indifference. With regard to the discrimination of disease, they must experience much difficulty, when, as in all smaller vessels, they are left to their own resources.

* Some vessels which I have recently inspected for the Board of Trade had exceedingly defective accommodation between decks for the crew. They were chiefly in the West Indian and fruit trade and no scorbutic cases occurred in them.

It is obvious that with a medical officer there is little likelihood of cases of scurvy being overlooked, even when by some ill chance they should have been permitted to occur. But several instances have come to my knowledge where the master has been treating men for rheumatism, or secondary syphilis, or climatic cachexy, and has been astonished to learn that when admitted to the *Dreadnought* they were indubitably suffering from sea scurvy. It may even happen that, with the best intentions he may, by mercurial or other injudicious, hap-hazard treatment, have done them grievous injury. The disease is slowly progressive, and the diagnosis is often difficult to an unprofessional person. Hæmorrhages, and even the spongy gums and black legs which are so characteristic, are long in making their appearance; and in the absence of such patent indications, the vague muscular pains and unaccountable languor, not accompanied by fever or emaciation or loss of appetite, are symptoms too often regarded with suspicion or contempt. Singularly enough, the scorbutic *ulcer*, of which in the systematic writers we hear so much, is at present very rarely seen even in the worst cases.

The more experienced or shrewder captains may treat the cases as scurvy from the beginning, but the means at their disposal are very limited. The muddy remains of the lime-juice are inert, and are given in double doses to no purpose. Citric acid or the nitrate of potash with vinegar are the other remedies in vogue. Purgatives and Dover's powder appear also to be largely used. Beer and pickles are sent from the cabin, but at this period of the voyage the stores there are already low or exhausted; the opportunity of replenishing them at the Cape or St. Helena has been neglected, and little can be afforded. Details of the treatment of each case are recorded, as required by law, in the official log book.

The results are not encouraging, and when the ship, delayed perhaps by baffling winds, arrives in the Thames, the unhappy patients are often in a most deplorable plight, and have to be hoisted on board the *Dreadnought* in a state of extreme prostration, unable, from the state of their mouths, to take any but soft or liquid food. Death sometimes ensues—its mode being by syncope, after some slight exertion. The greatest care is therefore taken to keep the patients tranquil. Another sad result occasionally seen is irremediable; stiffness and contraction of the joints. But as a rule the simple treatment employed operates as a charm, and re-

stores the sufferer in a few days or weeks to such enjoyment of life as he has long been a stranger to. The decks of the *Dreadnought* are regarded as a very paradise by those rescued wayfarers. Perfect recovery, however, is not a uniform consequence. Dr. Barnes, who on this subject speaks with the authority derived from an immense experience, has expressed his belief that "the physical deterioration of sailors from the modified starvation which culminates in scurvy is very great. The constitution that has once yielded to it is so far damaged that any latent predisposition to other disease, as to phthisis, is apt to acquire ascendancy and to hurry the victim to an untimely end. Of those who recover, many do so imperfectly."

The same axiom holds good with regard to the other great scourge of mariners (to which I called the attention of the Society two years ago), and which, to the disgrace of our civilisation, flourishes in rankest luxuriance in this port of London. We have seen how the syphilitic taint exposes to the attack of scurvy, and how, in the re-action, the blood-disease comes as an ally to strengthen the hold, both of syphilis and tuberculosis. The apostrophe of the poet is as true now as when it was written,—

"Poor child of danger, nursling of the storm;
Sad are the woes that wreck thy manly form!"

Actuated by humane and patriotic motives, the Seaman's Hospital Society have for some time fulfilled the important duty of reporting to the Board of Trade all such cases of scurvy as may be considered fairly referable to culpable neglect. For example, when two or more cases are received from a vessel with a crew not exceeding twenty men, the presumption is that the state of that vessel as to diet and other matters has been objectionable. On these representations the Board directs an inspection of the vessel and its various stores, and an inquiry into all the circumstances of the crew which may have led to such results. The master, officers, and crew are examined, as well as the patients on board the *Dreadnought*, and the entries in the log book concerning the sick are carefully scanned. The evidence is often very contradictory, ill feeling on both sides showing itself in discordant statements as to the simple facts. Sometimes the provisions and lime-juice are all consumed, and no opinion can be formed thereon. The crews are sometimes dispersed before the inspection can take place; thus, important links in the chain of evidence are sometimes wanting; yet the details of mismanagement elicited by these

inspections simply prove the necessity for them, and also for remedial measures of a preventive kind.

Six of these reports, with some others from the out-ports, were printed by order of the last parliament, and since then I have been again engaged on eight inquiries of similar character. In all these I had the valuable co-operation of Mr. Coleman, of the Registration of Seamen Office, who possesses an unrivalled knowledge and experience of the Merchant Shipping Act and its workings.

If time had permitted I would have placed some of these reports before the Society; but the facts, and the conclusions based on them, have been already discussed at considerable length. And we shall now come to the question as to how these crying evils shall be remedied. With all its admirable provisions, the Merchant Shipping Act of 1854 is defective; first, in not prescribing a dietary for seamen, of which fresh vegetables, or the best substitutes for them, should be positively enjoined as part; secondly, in not insisting that lime-juice should be served out *every day* on which fresh vegetables are not issued; and thirdly, in not providing that the lime-juice shall be ascertained to be of good quality, and supplied in such a form as to be reliable, for at least two years, as an anti-scorbutic.

The powers of the central government in this matter are at present limited. They can institute inquiries (such as these) to detect abuses, but not to prevent them. The local marine boards might, if they chose, cause inspections as to the quantity and quality of anti-scorbutics while being supplied before the voyage. The Board of Trade, recognising the great importance of *preventive* inspections, suggested the appointment of a medical officer for that purpose, at the ports of London, Liverpool, Dundee, Glasgow, Greenock, Hull, Newcastle, Shields, and Sunderland. But with the exception of London and Hull the replies of the local marine boards were decidedly unfavourable. The reasons they allege for being averse to such inspections are their disbelief in their necessity, the difficulty and even impracticability of carrying them out, and their tendency to interfere injuriously with the business of the port.

“Unless the inspection be general,” writes the Sunderland Board, “it would be throwing a most invidious duty upon the Superintendent of the Mercantile Marine Office to authorise him to select cases for inspection, and the Board are unable to conceive the existence of circumstances which would (except in extreme cases) justify his doing so. It

would be sure to create great dissatisfaction, and might expose the superintendent to the suspicion of being actuated by personal antipathies. If, on the other hand, the inspection were general, the inconvenience would become so great, that it would be all but impracticable."

I may observe that it is mainly from these very ports that our scurvy-tainted ships do come. Out of fifty-five cases admitted into the *Dreadnought* from ships belonging to British ports, eight were from Sunderland alone.

Only three months ago I inspected a vessel which sailed from that port, in whose crew, of only nineteen in all, two deaths occurred in the Thames from scurvy, and four others were a long while in the hospital ship suffering dreadfully from that cruel disease. The lime-juice, the master stated, was procured at Sunderland and was issued regularly. Here is a specimen of it. It is nothing more than the solution of citric acid, slightly flavoured with lemon, to which I adverted a little while ago, and is I believe of little or no value as an anti-scorbutic. Another vessel (from Kurra-chee) which I inspected, belonging to Stockton-on-Tees, furnished no less than eight cases—indeed, the whole crew were more more or less affected with scurvy, and those who had been hoisted on board the *Dreadnought* presented its most aggravated features. In this instance the lime-juice had been originally good, but from the faulty method of preservation had deteriorated. But it was distinctly adduced in evidence that it was irregularly taken, and that many of the crew systematically neglected it.

Another vessel which I inspected about a month ago, belonging to Liverpool, had a third of her crew disabled by scurvy, four of whom were for some time in the *Dreadnought*. Here the lime-juice was obtained from a native merchant at Calcutta, and soon spoiled, so as to be undrinkable. The disease broke out sooner than in most other cases. As no fewer than seven cases were then on the sick list, the ship called at Ascension and procured a supply of citric acid, but it failed either to relieve the sick or to prevent further extension of the malady. This is a specimen of the lime-juice, which will be found to be very offensive.

It is strange that facts like these do not carry conviction to the minds of the local authorities of our mercantile marine, and impel them to the course of action indicated by the Board of Trade.

In the absence of an official inspection, which would seem

to be the readiest and most efficacious way of meeting the case, various propositions have been entertained. As the owners and masters of ships appear to be unwilling to take the trouble to add the requisite spirit, and bottle off the lime-juice in such quantity as would insure its preservation, it seems to me desirable that licensed vendors should be required to do so; that the only form of supply should be in sealed small vessels of stone or glass; and that the sale should be accompanied by a certificate from the dealers, testifying to its purity and warranting it to keep. Respectable traders, receiving a fair price, would not decline a legal responsibility of this kind, and would, in self-defence, take greater care that the juice sold for consumption on long voyages should be of the best quality. This would do much to check the mal-practices of adulteration and manufacture which are now notoriously prevalent.

Another proposal (which seems practicable, at all events, in the larger ports), is the issue of the lime-juice to vessels only from *bond*, after being there tested and mixed with the proper amount of spirit. In this respect a slight saving would be effected, as the latter would be free from duty.

When the lime-juice is really good, and issued daily, and made into lemonade, little difficulty will, I think, be experienced in inducing the men to take it. Officers, however, should, as in the royal navy, show the good example of drinking it themselves. In the mercantile marine, those I have met with seldom or never take it; and thereby, I doubt not, unconsciously instil distrust of it into the minds of the younger hands. It is to be regretted that sounder notions on this branch of nautical hygiene should not find general acceptance. Those young officers are now, as a rule, well instructed in the science of their profession, and are often extremely able and intelligent men. Were they required to pass an examination of a simple character, on the subject of preserving the health of the crews they are destined to command, I believe a better *regime* would spring up in time, and some ideas now in vogue would become obsolete.

But, on the whole, it is to the owners rather than to the executive of the merchant navy, that we must chiefly look for corrective measures or for obstruction to them. It is obviously the interest of the captain to have his crew well fed and cared for, healthy and contented; for, without that, he cannot maintain the self-respect that is essential to discipline. But there is no doubt that, in many instances,

ship owners practise a too rigid economy; and that the hopes of the masters for employment and advancement, depend too much on the parsimony with which they can conduct their owners' business and enhance their profits. I am well aware that, by many shipping firms, much attention is paid to the health and comfort of their crews; and that scurvy is as much banished from their vessels as from Her Majesty's. But it is a matter of notoriety that, before the epoch of the Merchant Shipping Act, colossal fortunes were amassed through practices almost as flagitious as those we are in the habit of reprobating among slave-trading nations. Some of that leaven remains. To quote the expressive language of one most conversant with the subject, Dr. Barnes:—"The plight in which the poor sailors from certain services are admitted is pitiable to witness. Disabled by hardship, semi-starvation, and ill-usage of every kind, they are cast out with the same indifference with which a worn-out block would be thrown overboard. In such cases, owners and masters should be held personally liable in damages to the sailors whose health, their only possession, is injured. But, although they may have good grounds for an action at law for damages, sailors are not the kind of men to try a question of this nature for themselves."

For all parties the most eligible course would be found in state interference, and chiefly in the compulsion of preventive measures. £1 to £2 a-head in addition to the present usual supplies would procure, it is calculated, a scheme of diet resembling in variety that of emigrants, but considerably more abundant. Surely owners who desire to deal justly with servants, on whom their fortune so greatly depends, could hardly grudge such an outlay for a long oceanic voyage. Masters of ships are often strictly prohibited by their instructions from calling at the Cape of Good Hope and St. Helena on their return voyage. At the Cape at some seasons the weather in port is boisterous, and their insurance would be invalidated. But St. Helena is the most accessible of places at all times, and seems providentially designed for the refreshment of ships. Yet by almost every one of the vessels I have inspected, the island, although sighted, was passed by, and even when they were full of cases of scurvy.

We cannot wonder to find that the mortality in the mercantile marine is very great even as calculated on the present data, which are confessedly imperfect. My late friend and predecessor, Dr. McWilliam, estimated it from the records

of the Registration Office at about nineteen per thousand. But in truth it is considerably greater, for no account is there taken of the many hundreds who die unknown abroad, or who have to quit the service on account of disease contracted in it, and perish miserably at their own homes or in our civil hospitals and workhouses. It is admitted on all hands that a gradual but sure deterioration of this great body of men (about 250,000 in number) has been going on for some time, and gloomy prophets predict the possible extinction of the class. Certain it is that the adventurous youths of our country find a better vent for their energies in colonial enterprise and other pursuits, and we do not find either in the royal or merchant navy men of the same stamp as formerly. In the latter their place is supplied with thousands of foreigners, chiefly of the Scandinavian and German nations, who are attracted by the high rate of pay; they are considered by most masters I have seen as valuable acquisitions. Surely it is but just that these strangers, as well as our helpless fellow-countrymen, should not suffer from the cupidity of some of their employers, and so be discouraged from a service to which they are now essential.

I perceive that in a few days, viz., on the 12th of June, 1866, a motion will be made in the House of Commons for an address for a Royal Commission "to inquire into the present condition of merchant seamen with the view of ascertaining whether within the last thirty years the supply of British seamen has fallen off either in point of number or efficiency, and if in either a continuous decline should be apparent, then to ascertain further what are the causes which have led to such decline, and whether any remedy can be suggested."

I trust I have succeeded in my endeavour to exhibit one of the causes of this unsatisfactory state of things, and the obvious and easy remedies. Let us hope for speedy legislative action to amend the existing laws. Meanwhile, an expression of opinion from this Society on a matter of national importance cannot fail to give a valuable impetus to the movement. The recent enactments concerning the other great scourge of seamen—venereal diseases—are encouraging, and indicate a growing interest in parliament for sanitary questions. We may expect to see scurvy doomed to extinction at sea, as it long has been on land. May the time soon come when the miseries with which we are now too familiar shall be regarded as one of the curiosities of medical history; in the same light as we regard the terrible scorbutic epidemics

which slew whole armies, and which ravaged portions of the northern and central countries of Europe, from the time of the Crusaders to that of Frederick the Great, and of which we had recently a painful reminder in the Crimean war. Guided by the experience of that disastrous campaign (in elucidating which our distinguished ex-President, Dr. G. Milroy, had so great a share), we may reasonably infer that a similar calamity to the national force is not likely to recur. It is time that equal solicitude be shown for the welfare of those who constitute no small element of our naval force, and contribute so largely to the wealth and prosperity of the nation.
