

at sea, among whom it is said to be so often an epidemic calamity.

In the proof of the identity of this disease on both elements,¹ I observed, that the causes productive of it at sea, were to be found also at land, in a smaller degree : but before determining what are the true causes of its being so often epidemic at sea, it may not be amiss to remark what they are not, although commonly accused.

Many have ascribed this disease to the great quantity of sea-salt,² necessarily made use of by seamen in their diet: and it has been therefore denominated a *muriatic scurvy*.

Whether this salt, instead of producing the scurvy, may not, on the contrary, from its antiseptic quality, become the means of preventing it for some time, I shall not take upon me to determine, as my experiments do not authorise this conclusion ; though they plainly prove, that it neither causes the distemper, nor adds to its malignity. For in the cruises after mentioned, where the scurvy raged with great violence, it was then a fashionable custom to drink the salt water, by way of gentle physic. I have been told, that Admiral Martin, and several officers in his fleet, continued the use of it during a whole cruise. I had at that time several patients under a purging course of this water, for the itch, and obstinate ulcers on their legs ; and have experienced very good effects from it, especially in the last case : yet none of these people, after continuing this course for a month, had the least scorbutic complaint.

But to put it beyond all doubt, that sea-salt is not the occasion of the scurvy, I took two patients, (in

¹ Part I, chap. III.

² *Listeri exercitatio dt scorbuto.*

order to make trial of the effects of different medicines in this disease, to be more fully related afterwards), with very putrid gums, swelled legs, and contracted knees, to whom I gave half a pint of salt water, and sometimes more, every day for a fortnight : at the expiration of which time, I was not sensible of their being in the least worse ; but found them in the same condition as those who had taken no medicine whatever.¹ From which I am convinced, that sea-salt, at least the drinking of salt water, by no means disposes the constitution to this disease.

But I would not be understood here to mean, nor does it follow from what has been said, that although sea-water, which is a composition in which this salt is a principal ingredient, has no bad influence upon the scurvy, that a diet of salt flesh and fish is equally innocent. The contrary of which will appear in the sequel. The brine of meats, in particular, is of a different quality from either purified sea-salt or salt-water ; for we find that this salt may be so intangled by the animal oils, especially in salt pork, that it is with great difficulty disengaged from them after many washings, and the most plentiful dilution. So that us this saline quality is inextricable from such food, it is rendered improper in many cases to afford that soft, mild nourishment, which is required to repair the body. It is remarkable, that the powers of the human machine can animalise other salts ; that is, convert them into the ammoniacal sort, or that of its own nature : while this sea-salt seems to elude the force of our solids and fluids ; and retaining its own un-

¹ This experiment, of giving scorbutic people salt water, has been often tried ; and some have thought they received benefit from it. See chap IV.

changeable nature in the body, is to be recovered unaltered from the urine of those who have taken it. Thus, sea-salt has no effect in producing this disease ; whatever meats hardened and preserved by it may have, by being rendered of hard and difficult digestion, and improper for nourishment. And this is farther confirmed by the daily experience of seamen ; who, upon the first scorbutical complaint, are generally debarred the use of every thing that is the least salted ; notwithstanding which, the disease increases with great violence : While at other times, it breaks out when there is plenty of fresh flesh-provisions on board ; as was the case in Lord Anson's ships, on their leaving the coast of Mexico.¹

Others, again, have supposed such to be the constitution of the human body, that health and life cannot be preserved long, without the use of green herbage, vegetables, and fruits ; and that a long abstinence from these, is alone the cause of the disease.²

But if this were truly the case, we must have had the scurvy very accurately described by the ancients ; whose chief study seems to have been the art of war ; and whose manner of besieging towns was generally by a blockade, till they had forced a surrender by famine. Now, as they held out many months, sometimes years, without a supply of vegetables ; we

¹ *Vid.* part III, chap. II. Dr Mead, who was thoroughly acquainted with their situation, observes, that, upon that occasion, fresh flesh-provisions, and plenty of wholesome rain-water, did not avail them. *Discourse on the scurvy*, p. 100.

That salt flesh-meats have sometimes no share in occasioning this disease, is demonstrable from the many Germans in Hungary destroyed by it, who eat neither salt beef nor pork ; on the contrary, they had fresh beef at a very low price. *Vid.* *Krameri epist.*, p. 33.

The soldiers in the Russian armies also had no salt provisions. *Vid.* Nitzsch.

² *Observationes circa scorbutum ; auctore Fre. Bachstrom.*

should, no doubt, have heard of many dying of the scurvy, long before the magazines of dry provisions were exhausted. The continuance of those sieges far exceeded most of our modern ones ; even the five months blockade of Thorn, upon which Bachstrom has founded this supposition. It would likewise be a much more frequent disease in every country, than it really is : for there are persons every where, who, from choice, eat few or no green vegetables ; and some countries are deprived of the use of them for five or six months of the year ; as is the case of many parts in the highlands of Scotland, Newfoundland, &c., where, however, the scurvy is not a usual malady.

It would be tedious to give many instances, they being notorious, of ships crews continuing several months at sea, upon their ordinary diet, without any approach of the scurvy. I have been three months on a cruise, during which time none of the seamen tasted vegetables or greens of any sort ; and although for a great part of that time, from want of fresh water, their beef and pork were boiled in the sea-water, yet we returned into port without one scorbutical complaint. I have known messes, as they are called, of seamen, who have lived, during a whole voyage of three years, on the ship's provisions, for want of money to purchase better fare, especially greens : and who were so regardless of health, as to expend what little money they could procure, in brandy and spirits ; so that a few onions, or the like, was their whole sea-store ; and a meal with vegetables was seldom eat by them, above twice or thrice in a month, during the whole voyage. Notwithstanding which, they have kept free from the scurvy.

But it was remarkable, in the two cruises after-

wards to be mentioned, in his Majesty's ship the *Salisbury*, where I had an opportunity of making observations on this disease, that it began to rage on board that ship, and indeed all the Channel squadron, upon being less than six weeks at sea ; and after having left Plymouth, where plenty of all sorts of greens were to be had ; by which, as one would have thought, the sailors had sufficiently prepared their bodies against the attack of this malady. Yet here, in so short a time as two months, out of 4000 men in that fleet, 400 at least became more highly scorbutic,¹ than could reasonably have been expected, had they all been debarred the use of vegetables for six months on shore, like our highlanders, and many others. And what puts it beyond all doubt, that the disease was not occasioned solely by the want of vegetables for so short a time, is, that the same ship's company of the *Salisbury*, in much longer cruises, kept quite free from the distemper, where their circumstances as to want of fresh vegetables were similar. It was observable, that in the longest cruise she performed, while I was surgeon, there was but one scorbutical patient on board, who fell into the disease after having had an intermitting fever. We were out at that time from the 10th of

¹ Upon the return of the fleet to Plymouth, Dr Huxham makes the following remark in the month of July 1746. *Terribilis jam savit scorbutus inter nautas, praecipue quos secum reduxit Martin, classis occidentalis praefectus. Excruciantur perplurimi ulceribus faedis, lividis, sordidis, ac valde fungosis : mirum est profecto et insolitum, quam brevi tempore spongiosa caro, fungi ad instar, his ulceribus succrescit, etsi paulo ante scalpello derasa, eaque interdum ad magnitudinem enormem. Non solum miseris his, at vere utilibus hominibus, per se infensa est maxime scorbutica lues, sed et illos etiam omni pene morbo, qui ab humorum corruptione pendet, obnoxios admodum reddit; febribus nempe putridis, malignis, petechialibus, pessimo variolarum generi, dysenteriae cruentae, haemorrhagiis, &c. Multo magis adeo bonis his fuit exitio quam hellicum fullmen!* Observationes de aëre et morbis epidemicis.

August to the 28th of October ; which was a twelve weeks continuance at sea, and consequently as long an abstinence from vegetables.

So that although it is a certain and experienced truth, that the use of greens and vegetables is effectual in preventing the disease, and extremely beneficial in the cure ; and thus we shall say, that abstinence from them, in certain circumstances, proves the *occasional cause* of the evil ; yet there are unquestionably to be found at sea, other strong sources of it ; which, with respect to the former, (or want of vegetables), we shall hereafter distinguish by the name of the *predisposing causes* to it. The influences of which latter, at times, must be extremely great, as in the case of Lord Anson's squadron in passing round Cape Horn,¹ to induce so universal a calamity ; from which hardly any one of them seems to have been exempted, attended with the mortality of above one half of them, when they had been but little more than three months at sea : while whole countries are observed to live on the same, nay, even a less wholesome diet ; and many people for years abstain from vegetables, without almost any inconveniency.

Some have alledged this to proceed from something peculiar in the confined and polluted air of a ship ; and the stagnation of the bilge-water in the hold has been accused as a main cause of the distress. But had this last the effects presumed, they would be most sensibly felt by those who are most exposed to it, *viz.* the carpenters ; who at sea are often obliged to measure, every four hours, the quantity of bilge-water ; and do then, and at other times in mending the pumps, suffer very great inconveniences, being almost suffo-

¹ *Vid.* part III, chap. II.

A TREATISE OF THE SCURVY

IN THREE PARTS

*Containing an inquiry into the Nature, Causes,
and Cure, of that Disease
together with a Critical and Chronological View
of what has been published
on the subject*

BY

JAMES LIND, M.D.

Fellow of the Royal College of Physicians
in Edinburgh

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LIND'S TREATISE ON SCURVY

*A Bicentenary Volume
containing a reprint of the First Edition of
A TREATISE OF THE SCURVY
by James Lind, M.D.
with Additional Notes*

EDITED BY

C. P. STEWART, PH.D., D.SC.

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JAMES LIND, M.D.

Frontispiece

From an engraving by I. Wright from a painting by Sir George Chalmers, Bart. (1783). The engraving forms the Frontispiece to the copy of Lind's *Essay on Diseases incidental to Europeans in Hot Climates* in the library of Haslar Hospital. The signature is from Lind's letter to Sir Alexander Dick.

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LETTER FROM JAMES LIND TO SIR ALEXANDER DICK 391

In this letter, dated 18th May 1758, Lind resigns the Treasurership of the Royal College of Physicians of Edinburgh on his appointment as Physician to Haslar Hospital.

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