

**Observations on the scurvy : with a review of the theories lately advanced upon that disease, and the opinions of Dr. Milman refuted from practice.**

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OBSERVATIONS  
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 ON THE  
 SCURVY:

WITH A  
 REVIEW OF THE THEORIES  
 LATELY ADVANCED ON THAT DISEASE;

AND THE  
 OPINIONS OF DR MILMAN  
 REFUTED FROM PRACTICE.

BY  
 THOMAS TROTTER,  
 A SURGEON OF HIS MAJESTY'S NAVY; AND  
 MEMBER OF THE ROYAL MEDICAL SOCIETY OF EDINBURGH.

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*—neve hæc nostris spectentur ab annis  
 Quæ ferimus. VIRG. Æneid.*

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EDINBURGH:  
 PRINTED FOR CHARLES ELLIOT; AND  
 G. G. J. AND J. ROBINSON, LONDON.

M,DCC,LXXXVI.

OBSERVATIONS

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Printed by J. Ballantyne, Edinburgh.  
1804.



EDINBURGH

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G.O. JAMES & ROBINSON, London.

Specimen

TO THE RIGHT HONOURABLE

LORD VISCOUNT HOWE,

FIRST LORD OF THE ADMIRALTY, &c.

MY LORD,

**T**HE present station you hold  
in the service of your coun-  
try as an officer and senator, your  
esteemed professional abilities and

knowledge of the marine department, and a name that has long been dear to every British seaman, point you out as the most conspicuous character to patronise a work that has in view the naval and commercial interest of these realms.

FROM you, My Lord, in a particular manner, undertakings of this kind look for protection; and the period is now arrived, when professional men, under Your administration,

## DEDICATION.

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nistration, hope for a redress of those complaints, that, by the consent of all ranks, are allowed to be baneful to the welfare of our Navy.

IN the following Observations, by an induction of facts candidly related, I have endeavoured to show, that a new doctrine on Scurvy, lately published by a learned Physician, now at the summit of medical preferment, is inconsistent with the real nature of the disease; and that his opinions are dangerous to be

be adopted, both in the prevention and cure. However I may have failed in this, I have sufficiently proved, we are not yet to sit down content with our knowledge of the disease, or think ourselves arrived at the perfection of a science, where the wisest and oldest are still at school.

If my attempt should be the means of alleviating the distresses of that brave body of men among whom it has been so often fatal, or  
excite

excite others whose experience has been more matured with years and extensive observation, I shall console myself with having offered my mite, as a tribute due that department in the Navy to which I belong.

I have the honour to be,

My LORD,

Your Lordship's

most obedient, and

very humble servant,

WOOLER,  
Nov. 16. 1785. }

T. TROTTER.

excite others whose experience has  
 been more matured with years and  
 extensive observation, I shall console  
 myself with having offered my  
 mite, as a tribute due that depart-  
 ment in the Navy to which I be-  
 long.

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My Lord,

Your Lordship's

most obedient, and

very humble servant,

Wooler,  
 Nov. 16. 1787.

T. Trotter.

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## INTRODUCTION.

**P**ERHAPS no man ever became an author without some motive for his publication. "In every branch of science," says Dr Cullen, "with respect to which new facts  
" are daily acquired, and these consequently  
" giving occasion to new reflections which  
" correct the principles formerly adopted, it

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" is

“ is necessary from time to time to reform  
“ and renew the whole system with all the  
“ additions and amendments it has received and is then capable of.” Under the sanction of the above quotation, I must apologise for my intrusion on the public. The process of putrefaction in the living body in scurvy, having lately given rise to some ingenious speculations in our schools of physic, I shall hope to be pardoned for contributing a little to the stock of facts on that subject; and some which, I apprehend, will not be altogether unacceptable to those who wish to prosecute the matter still farther.

To write on a disease that has already employed the pen of the late learned Dr Lind, is a task, I must confess, on which I enter with much diffidence and regret. The very extensive practice of that gentleman while

a surgeon in the navy, and physician to one of the greatest marine hospitals in the world, enabled him to produce a greater number of facts than most practitioners that have ever written. To his Treatise on Scurvy we are indebted for our present improved knowledge of the disease; and as his own experience and actual observation had been so long conversant with every stage of it, we are not to wonder that his opinions should still be the appeal of the different combatants, whether it is a disease primarily of the solids or fluids. But, notwithstanding the history Lind has given us, in several places of his work he has left us much in the dark; and the doubts he has raised have been the cause of much controversy. It seemed therefore a subject worthy of criticism, as modern physicians are disposed to banish a humoral pathology from the doctrine of diseases.

THERE is perhaps no disorder on which the speculating commentator may form notions more distant from its real nature than scurvy: And those who have seen some practice in it, must be convinced of the truth of my assertions, if they consult a book lately written on that subject. I must remark, however, the work alluded to has not been offered to the world with that diffidence and reserve to which authors have recourse when they attempt to broach new opinions and introduce innovations in science; on the contrary, we have met with it as established on facts not to be questioned. But though the notions here inculcated are ingenious and new, the learned Dr Milman has been accused of publishing the opinions of another man, well known as the leader of a doctrine, that has been so peculiarly employed in collecting every new shade of theory that could tend in the least to darken  
the

the lustre of the Cullenian æra. But it is sufficient to mention this, and hope for every author to enjoy the merit of his own discoveries.

SINCE the publication of this new theory on the proximate cause of putrid diseases, it is no unfashionable part of medical conversation for students to talk of curing scurvy by brandy and opium: The latter, as they have found it to be a most powerful stimulant, so it must be the fittest for overcoming a disease of debility. It is, however, to be hoped, that these gentlemen will carry their speculations no farther than their closets.

SUCH is the present state of opinions concerning scurvy; and, I am sorry to add, too much the case with many other diseases of the human body. Theories, advanced on

speculative notions, must ever be baneful to science. In medicine this is particularly the case: Some fixed appeal in most of the arts has generally decided the unprejudiced inquirer; but to the disgrace of physic as a liberal profession, no such coalition of theory has yet taken place, and facts themselves are daily perverted to serve favourite opinions.

WHEN we reflect on the vast sums of money that have been spent on the recruiting and support of our navy, we must at the same time lament how sparingly it has been applied where the health of a sailor is at stake. To show that this is true, I need only mention, that many of our ships of war on foreign stations have actually buried the whole of the complement they carried from England, independent of those who have died in action: And thus they have consequently

frequently fallen a sacrifice to the diseases of long voyages and unwholesome climates. Though these misfortunes are not now to be remedied, it might yet be some consequence in future to avoid, if possible, such calamities, by informing us of the causes of these disasters in our ships of war.

WHEN we are told of five hundred surgeons having under their care the lives of 120,000 men in every different climate of the globe during a long war, and that so few of that number should have favoured the medical world with any new observation, what must we impute it to? Surely not merely because a sea life affords no asylum for study, or that no men of science are among the number. But when it is told, that upwards of three hundred of that number are turned *adrift* at the end of a war, without any reward for service or provision

whatsoever, can it be surprising they should retire with disgust; and that, while the human mind is concerned for its own safety, art and science must languish, and inquiry be deserted?

O-B-

# OBSERVATIONS

ON THE

S C U R V Y.

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## SECTION I.

**I**T is a matter of little consequence to us, whether the scurvy was known and described by the ancients ; and the ingenuity of some late writers has been as little successful in clearing the point. Disputes concerning the derivation of the word *scorbutus*

*butus* are equally frivolous: they have led some to confound the disease with symptoms by no means essential to it; and thus they reconcile the *splen magnus* and *convolutus sanguineus* to be the same with scurvy; and consequently it was known to Hippocrates. What value the authority of antiquity may confer on the history of diseases is not to be disputed: but the labours of these gentlemen have been as much misapplied here as others were in exploring the *herba Britannica* of the Roman naturalist (celebrated for having cured the disorder in the Roman army); for we do not find in the writings of the ancient physicians any thing worthy to be sought after, either in the history of the symptoms or cure of scurvy.

Modern nosologists have been at some pains to give us a definition of Scorbutus, by which it may always be distinguished: And as it has been often thought to be a disease almost peculiar to our northern latitudes,

tudes, Dr Cullen begins with the words *In regione frigida*. According to the present opinions this was certainly a very just preamble; but in this undertaking I shall produce facts sufficient for confirmation, that scurvy is not confined to cold countries, and that cold itself is not essential to the production of it. The *anorexia* of Linnæus I must also reject, as being indefinite of the character of scorbutus; and the *urina pellucula tecta* of Sagar, as well as that state of the pulse and urine so much talked of by different writers, are all liable to the same objection.

The notions of acid and alkaline scurvies, with other subdivisions, are so hypothetical and inconsistent with our present ideas of the animal œconomy and modern pathology, as to need only mention to be refuted. We are now well assured that there is but one scurvy, which is the same from all the different causes; and the same method

thod of cure is equally to be pursued throughout the whole.

Ever since we had the first accounts of this disease clearly ascertained by different authors, the causes producing it have been uniform and much the same. A diet of salted and smoke-dried provision, a too large proportion of animal-food, and even damaged provisions of different kinds, have contributed towards the cause. Low, damp situations, bordering on marshes and stagnant waters, have also had their effects; and to all these may be added, a deficiency of fresh vegetable matter, and the influence of cold, whether from season or climate.

In the laborious collection of facts with which the industrious Dr Lind has furnished us, we find that scurvy has occurred from even opposite causes; and surgeons of East Indiamen have informed me, that they met with it in ships when the crew lived altogether on rice. But as I had no particular

cular description of this occurrence, I have nothing further to draw from the fact. That it ever was known but after a diet of salted provisions, has been doubted; and as this could not be attributed to serve a favourite theory, I must impute it to that want of attention to a disease that more seldom than others have come under the observation of men of inquiry.

At the conclusion of the late war, and from my rank on the Navy List not intitling me to immediate employ, it was my fortune to embark on an African voyage. In conversation on the diseases peculiar to the seamen and Negroes in this trade, I found the scurvy had been often met with among the latter. From unfortunate circumstances, and delay in completing the cargo of our ship, which was to be from seven to eight hundred; about eight or nine months from the time we arrived on the coast, the scurvy began to break out among us. Such have at  
different

different times been the devastations of this dreadful malady, that whole cargoes have been carried off by it. As the prevention and cure is of the first importance to the commercial interests of this kingdom, and as it has never yet been the subject of medical inquiry, I shall be the more particular in my history of its antecedents and symptoms in the course of these Observations.

Much has been advanced on the predisposing causes of scurvy; and some authors have in many places lost sight of the exciting for the predisposing. Those who have been particularly liable to it, and in whom it has been generally observed first to occur, are those weakened by preceding disease, and in a convalescent state are too soon put upon the common allowance of the ship. The lazy and inactive are next apt to suffer: hence it is proverbial among seamen, that the first scorbutics are skulkers. This set of people called skulkers, not only fly  
2 from

from duty, but deprive themselves of exercise, and are always of a repining disposition. Thus it is that impressed men, and raw landmen, share its first effects. Among the predisposing causes, excessive fatigue is also mentioned; and its appearance in our ships of war is often after hard gales of wind, where the crew had been much fatigued with the necessary duty of the ship during tempestuous weather. Persons of the melancholic temperament are universally observed among the number afflicted with scurvy wherever the occasional causes were acting: and when we consider that the hypochondriacal disease is confined to that temperament, we may perceive why some authors have confounded them together. In these cases, in a beginning scurvy, I have often marked a degree of fearfulness and despondency; but, so far as my experience goes, without any signs of dyspepsia, which properly characterise hypochondriasis.

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In forming a diagnosis of scurvy, there is but little danger of taking it to be a different disease. When we consider the antecedents; and that any of its symptoms with which it is apt to be confounded with other disorders, have never been observed without some sign that perfectly distinguishes it; there can be little hazard of the attentive practitioner forming a wrong diagnostic.

Different kinds of herpes often pass for scurvy, as being peculiar to certain constitutions; but such a term as a scorbutic habit seems altogether fanciful.

In enumerating the symptoms of scurvy, I shall here confine myself to the manner it generally makes its appearance on board of his Majesty's ships; and reserve some singular occurrences, not hitherto mentioned, that I met with among the Negroes, when I come to relate its appearance in the Guinea-men.

Every person who has been a sea voyage,  
must

must have perceived that longing desire for fresh vegetables, after being for some time deprived of them. This I have often marked the harbinger of scurvy. Dr Lind, in some part of his work, has mentioned the same circumstance: and he might very justly have put it down as a symptom; for it is more or less an attendant on the disease; and not only amuses their waking hours with thoughts of green fields and rivers of pure water, but in dreams they are tantalised with the same ideas, and on waking nothing is so mortifying as the disappointment. When I heard a sailor expressing these desires, and lolling about, I was not surpris'd to find him complain of sore gums, &c. a few days after. About this time the colour of the face looks fallow, the eye is dull and heavy, and the whole countenance as it were bloated: the patient feels himself wearied even after sleep, and complains of pains in different parts of the body: he

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grows

grows inactive, and easily fatigued; often timid; has gloomy ideas about his safety, as if hypochondriacal; he flies from duty, and wishes to indulge in sloth. To these generally succeed the appearance of the gums which so especially characterizes scurvy: they swell, are spongy, and bleed on the slightest cause. The breath is fetid, and often attended with some disagreeable taste of the mouth. Some difficulty of respiration also now takes place on the patient using exercise; but commonly inconsiderable in this stage, which may be called the first.

All the symptoms now mentioned, in some cases increase rapidly; while in others they make little progress even for weeks; and they are by no means regular in succession. At one time the first appearance of scurvy is known from the ulcers having a thick coat of blood lying over their surface, called by the sailors *bullock's liver*, which it very much resembles; and on removing  
this

this substance, in a few hours it exhibits the same appearance. At other times, it is first perceived from a swelling in the legs, which retain the impression of one's finger; while a contrary feel often discovers it by some contraction and rigidity in the hamstrings, with a slight discoloration of the skin in the ham. This is frequently so considerable, as to prevent the patient altogether from walking; and I have seen it remain for months after every other symptom of scurvy disappeared.

As the disease advances, the lassitude, languor, and debility become more considerable: The respiration is oppressed on the slightest exertions, with a proneness to faint in an erect posture, and on being exposed to air colder than the temperature they had just before breathed. It is not uncommon for sailors, afflicted with scurvy, to walk upon deck, and drop down irrecoverably; though to all appearance, when below, there

seemed no danger. From this I must infer no just prognosis can be always formed. The fetor of the breath now becomes more intolerable: Pieces of the gums fall off like cloats of coagulated blood: The teeth are loosened in their sockets, and sometimes drop out while the patient is eating: Spots of different sizes appear on the skin, and the colour is variously modified from effusions in the cellular texture: Every slight scratch is apt to degenerate into a foul ulcer, and old sores are apt to break out afresh. Hemorrhagies are now frequent from different parts of the body; and though the loss of blood has been small, there are instances of the patient expiring immediately after: The belly is generally costive, but diarrhœas are not uncommon: Nothing satisfactory is to be learned from the state of the pulse, for it is often to be felt regular a short time before death. The mind in the beginning of the disease is timid and desponding, but

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towards the fatal period there is a total indifference and seeming torpor of every feeling. Throughout every stage, for the most part, the appetite continues unimpaired; and the patient is known frequently to expire with the bit in his mouth.

I shall now relate in what manner the scurvy made its appearance among the slaves on board of the African trader.

About the beginning of July 1783, the Liverpool Guineaman, of which I was surgeon, came to anchor off Cape la Hore. No ship had traded here for some time, so that in the space of a week we purchased a hundred slaves. They were all young, stout, and apparently healthy. After being so far lucky in beginning our purchase, we proceeded to Anamaboe to complete the cargo. On coming to anchor at Cape Coast Castle, we were informed of the slaves not only being scarce, but very dear, from the number of vessels then lying in the road.

So slow was now the progress of our trade, that in February we had not bought two-thirds of our number. About this time I perceived the slaves first purchased growing exceedingly fat; and on that account urged to the master the necessity of allowing them more exercise, or reducing the quantity of their diet, which had hitherto been too much, from a mistaken notion that it would strengthen them the more for a passage to the West Indies. Their diet consisted of beans, rice, and Indian corn, alternately, boiled; to which was added a sufficiency of Guinea pepper, and a small proportion of palm oil and common salt. A crew, which held from fourteen to seventeen quarts of this composition, which was of the consistence of a soft paste, was given to ten of them two times in the day: They were allowed to drink water at pleasure. But from being confined for fifteen or sixteen hours below, and permitted no exercise  
when

when upon deck, it was easy to foresee they could not remain long in a healthy state. Such, however, was the obstinacy of the master of the vessel, that this treatment was still persisted in : The food was given them in equal quantity ; and though a certain number might have been taken out of irons at a time without endangering the safety of the ship, it was not attended to. The custom of dancing them to the sound of a drum, perhaps from a dislike the commander had to every species of harmony, was also denied them till too late.

It will be proper to observe here, that these poor wretches are chained two and two by the wrists and ankles : such as are suspected of doing mischief, are likewise chained to the deck during the day. The rooms below are from five to six feet in height, according to the size of the ship ; and besides the number that can lie on the deck, half as many lie on a platform that runs

each side of the ship, raised about two feet and a half from the floor, equal in breadth to the length of a man. Here they are stowed *spoonways*, as it is called, and so close locked in one anothers arms, that it is not possible to tread among them. The rooms are imperfectly aired by gratings above and small scuttles in the side of the ship, which are obliged to be shut at sea, and the gratings are covered with tarpaulings when it blows hard or during rainy weather. The temperature in these apartments, when nearly full, was about 100° of Farenheit's scale; the effluvia is so intolerable, that in a few minutes you may have the condensed vapour from your face in great quantity. During the season of the year that the ship was on the coast, there scarce fell a shower of rain, and the weather was not more sultry than usual in these latitudes \*.

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\* From all my inquiries, I was not able to learn that  
such

In this situation things remained with us till the beginning of March, no precaution being used to secure the health of the cargo, when a corpulent young Negro complained to me of a hardness in the supinator radii longus of his right arm. It had a very unusual feel, and the skin did not retain the smallest impression of the finger or of any force I could apply. He was ordered some simple thing to rub it with; but on inspecting it next day, I found the hardness extend to all the muscles on the upper part of the fore-arm, with some contraction at the joint of the elbow and rigidity of the tendinous aponeurosis of the biceps: The parts affected were not in the least swelled or increased in size. And in this manner did it gradually spread up the arm to the shoulder

such a disease as scurvy was ever seen among the natives of Africa on shore: But I verily believe it has occurred more frequently in Guineamen than has been supposed.

der over the muscles of the neck and lower jaw, producing a *trismus*; and from thence downwards, till a spastic rigidity pervaded every muscle of the body. About the time this hardness extended so far up as his shoulder, a stupor came on; and while he retained the use of his other hand, he continued picking straws from the deck as people do the bed-cloaths in a state of delirium. The eye now became fixed, and the tongue lolled out at the side of the mouth for three days before death. In this case the warm-bath was tried, and persisted in for some time without effect; and when endeavouring to force the mouth open to try another remedy, I first found the gums exhibit the appearance as in scurvy, and separating in black masses from the teeth, many of which were loose, and the fetor of the breath intolerable.

There was now little doubt that the disease in question was scurvy, though I could  
by

by no means reconcile circumstances to any thing I had ever read or seen of it; but as I had heard of it occurring among Negroes where the like causes were acting, I was the more confirmed in my opinion.

It was now time to think of either preventing it among the other slaves, or taking it at the beginning; and as the one just dead was remarkably fat, it was most probable those in the like situation would be sufferers. I accordingly selected the most corpulent; and on examining them closely all over, found the like hardnesses in many of their limbs. Their gums were just beginning to show the appearance of flesh sprouting out from them; they complained of pains and weaknesses in their extremities; and wherever they lay down, were ready to fall asleep. Ulcers on any part of the body were covered with the cloated blood formerly taken notice of. Many of  
them

them, instead of the hard spots on their limbs, had their legs swelled, and pitting on pressure: a peculiar stupor was observed in some, which in the advanced stage of the disease turned to delirium; and none but one with this symptom ever recovered. A contraction of the joints of the ham and elbow was equally frequent. In a few, there were hemorrhagies from the nose, and a purging of blood \*. These appearances were all for some time confined to the slaves that had been longest on board; and among them, to those that were most corpulent and used least exercise. So certain was I of this, that when I saw a Negro taking on fat too rapidly, I could judge when he would be seized in the like manner. Thus it advanced among them by quick degrees, till it showed every different symptom taken notice

\* The blood that flowed from these hemorrhagies was always of a darker colour than natural; and when cold, only formed a partial coagulum.

ttice of by authors. When it came to affect a greater number than those of the first purchase, I could perceive the natives of some different countries more liable to it than others. Of these were what are called the *Dunco* country; of a fallow complexion, the heavy dull look, inactive and gloomy turn of mind: While the Fantees, who are preferred to all other natives of Guinea on account of their fine black colour and genteel shape, were scarcely tainted with the disease. These, on the contrary, are a cheerful lively people, and generally the first to raise mutiny in ships, or undertake any hazardous enterprise.

This is a proof, that depressing passions of the mind have a powerful effect in the production of scurvy. I can by no means suppose the Negro feels no parting pang when he bids farewell to his country, his liberty, his friends, and all that is to be valued in existence. In the night they are of-

ten heard making a hideous moan. This happens when waking from sleep, after a dream that had presented to their imagination their home and friends. Those who have ever known what it is to deplore the separation of a tender tie, must have remarked how exquisite sensibility becomes after a dream that painted to their fancy the image of some darling object.

Of all the women only eight were affected, and that number was confined to the Duncos. Few boys were tainted, from being out of irons, and allowed to run about the ship.

During all this none of the sailors had the least scorbutic complaint, though they generally eat a portion of the slaves victuals with their salted beef. But they had at all times plenty of fresh vegetables, which they purchased themselves from the natives, and which I believe was a means of correcting the bad properties of the water they used.

This water was taken from a stagnant lake; and so full of animalcules, that when strained through a stone, and kept for the space of a few hours, it again exhibited the like number of living atoms. It had likewise the effect of producing the Guinea-worm among the Negroes first purchased, who had no signs of it till living on this water for some months.

Our situation was now so bad, that numbers were daily taken ill, and others dropping off; while the Master of the vessel, whose character was perfectly congenial to the trade, attributed every misfortune to the machinations of the Doctor and Devil. At the end of April, however, our purchase was completed; and when we left the coast had buried seven or eight of the scorbutics, from eighty to ninety were ill, and more likely to add to the number. Our stock of vegetables at departure did not exceed a few gallons

gallons of lime-juice, ten or twelve dozen of oranges, and some baskets of guavas.

After being three or four days at sea, our list of scorbutics was nearly doubled; and I suspected much mortality from a flux spreading among them. My surprise was now a good deal excited, on finding two slaves, who had been only twelve days on board, complained of sore gums, pains of their limbs, with some degree of stiffness in the joint of the knee; and in a few days more, ten or twelve of the last fortnight's purchase were added to the number. I had before ascribed the disease to an over-proportion of food and want of exercise: and I was well assured the scurvy had never made its appearance among Negroes on ship-board sooner than some months confinement; so that in the present case, I was to look for some other cause. It has been often asked, If the scurvy is a putrid disease, why is it not contagious? Some old writers have affirmed,

firmed that it is contagious: but Dr Lind tries to refute this assertion from his own experience. Still, notwithstanding the authority of Dr Lind, it seems probable to me, in this instance, the scurvy was spread by contagion. When we consider such an atmosphere as has been described, where the slaves are kept, and of so high a temperature, tainted with the offensive effluvia from so many scorbutic lungs, can we wonder that this foul air, when breathed again, or applied to the bodies of others in a manner we cannot comprehend, should be highly noxious? I know it will be readily allowed, that foul air, not diffused in the atmosphere, may in a short time acquire such a degree of virulence as to produce fever: but are there facts to prove, that in such a situation as this it would not produce scurvy? Many writers on the disease mention impure air, damps, &c. among the remote causes: and if the doctrine of ferments is

to be at all admitted, it is as likely those effluvia may communicate scurvy, as inoculation may communicate small-pox, itch, or any contagious disease, when taken into the body.

Our small stock of antiscorbutics being soon consumed, the state of our cargo was left miserable indeed. The decks in every corner were covered with miserable objects, exhibiting views of distress equal to any ever recorded of this loathsome distemper. Several were affected in a manner similar to the first; others dropped down immediately on coming upon deck; while some expired at their victuals in full flesh and blood. After a five weeks passage, however, we made Antigua, having buried forty by the way; and it is probable, that had we been ten days more at sea, half the cargo must have perished, there being at this time three hundred tainted in different degrees with scurvy.

We

We had it now in our power to alleviate the distresses of these poor wretches; and as their confinement was no longer requisite for the safety of the ship, they were all immediately set at liberty. Supplies of fresh vegetables were procured from the shore, consisting of lemons, limes, oranges, pine-apples, &c. These were distributed among them occasionally; and notwithstanding they continued their usual diet, in the space of eight days, at which time we arrived at Jamaica, there was little remains of scurvy among them. They were now fed and prepared for market; the offals of beef were boiled among their victuals; and on the week following the sale of the cargo opened at a very high price.

I have now finished the history of this remarkable disease as it occurred in a Guineaman. I shall next examine the opinion of some late authors concerning the proximate cause; and by comparing facts from

practice, endeavour to reconcile theories to a more just and accurate knowledge of its real nature than has lately been attempted.

SECT.

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## SECTION II.

**F**ROM the history of Scurvy given in the preceding pages, it must appear, that the causes producing it are not only various, but in some degree opposite. Such different causes, then, producing one effect in the body, must ever make theories on this disease doubtful and uncertain. Notwithstanding the many improvements modern anatomists have made in demonstrating the structure of the human machine, every physiologist must confess how much

we are still in the dark concerning many operations in the animal œconomy: so that all reasoning not consistent with principles established in practice, must be foreign to the genuine method of cure, and consequently dangerous to be adopted. No disease whatever makes its appearance with so many symptoms, and so complicated and different in different people, as scurvy. Throughout the whole of its stages, there is something so peculiar to itself, that no description, however accurate, can give the reader an idea adequate to its real nature.

From the oldest authors who have written on scurvy, it has been classed among putrid diseases. The very nature of its production, the fetor of the breath, cadaverous smell of the ulcers, and bloated appearance of the whole body, have acquired it this appellation. This putrescency, till very lately, was said to exist in the blood; and Dr Lind, in the last edition of his work, is  
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the first who has objected to the generally received opinion. Dr Milman, improving on these hints, in a book lately published, intitled, "An Inquiry into the Source from whence the symptoms of Scurvy and Putrid Fever arise," undertakes to prove the blood altogether innocent, and that its sensible qualities are not changed. Since then, as I have remarked, the hints of Dr Lind seem to have given rise to these new opinions; and that all the phenomena of scurvy are to be very differently fought, and more satisfactorily accounted for, from a diminution of the vital power in the moving solids; I shall proceed to examine the validity of their arguments, so far as practice is concerned.

In the first place, it is the favourite opinion of Lind, that a seaman's diet is only hurtful as being of difficult digestion, and not from being salted. To prove the innocence of salted meats, he produces experi-

ments of salt-water being drank in great quantities with impunity, and even scorbutic failors using it without any bad effect. All this may be very true. Salt taken in this way is powerfully diluted with a quantity of water; to which in a great measure is owing its purgative qualities. Since then it has a purgative quality, and, by remaining so short a time in the intestinal canal, there is either so small a quantity taken up by the absorbents, or what enters the circulation must be so much diluted with the water taken with it, that though the salt may not be capable of assimilation with our fluids, this water may still prove the means of its being carried the easier and sooner off by the various excretions; thus certainly salt has been taken with impunity, as we daily see: But can we apply the like reasoning to the manner it is taken with salt beef or pork? In all accounts of the disease from those who have been conversant with

with it in our ships of war, till the small-beer was done, and the water served in allowance, the scurvy is seldom known. So that plentiful dilution is of some consequence in the prevention; and I am apt to believe the salt is hurtful, from being retained in the body.

The experiments of Sir John Pringle concerning the antiseptic properties of sea-salt, appear to me not fit to be trusted in explaining any process within the body; and I shall reject them from the same reasons as the supporters of the other side of the question.

Another proof Dr Lind adds, to show that these provisions are not hurtful from being salted, is, That ships crews have lived for a long time at sea, in perfect health, without the use of vegetables. This I will not deny; but is it consistent with the inferences he has elsewhere drawn? How comes it that ships companies living so long on an  
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indigestible diet should remain healthy? If a seaman's food is hurtful from this quality, it is very natural to suppose the effect would be in proportion to the time the causes were acting; which is not the case: for instead of weak and emaciated habits, he tells us they returned to port, after a three or four months cruise, healthy and vigorous.

To strengthen this part of their argument, Dr Milman produces the singular health of Captain Cook's people in an expedition to the South Seas. But to show this is of no weight, I would only affirm, that Captain Cook's ships were fitted out in a very different manner from our common ships of war; and the very causes Milman assigns for the healthfulness of the crews, did most certainly prevent the bad effects of a salted diet. These ships carried a much greater proportion of water to sea than is commonly done; this was also often renewed;

newed: when in port, he provided them not only with stock in abundance, but always procured them as many fresh fruits and vegetables as they could well carry with them. Thus the scurvy was so little known in these ships. But had Dr Milman considered how impossible it would be, and how inconsistent with the nature of our marine service to fit out every ship of war in that manner, he would not be surprised to find the scurvy so frequent on board of his Majesty's ships while the seamen live on salted provisions.

Lind's notions, that an animal body cannot assimilate sea-salt, seem to me equally inconclusive. Though he took this salt unchanged from the urine of scorbutics, yet he draws no comparison between the quantity taken in and that recovered: and as it is said, that in scurvy there is a preternatural saline state of the blood present; and consequently so loaded already with an animal salt, that  
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it may not be able to assimilate more ; can we then be surpris'd to find the sea-salt pass off unchanged by the kidneys? But I doubt much if the common salt has been recovered so pure as has been alleged ; and, if we are to trust some late chemical trials, it was found to be rather of the ammoniacal kind : and whether this will be admitted or not, till future experiments determine, I would reject the conclusions Dr Lind draws. But further, concerning this particular, Dr Cullen says ; “ Even supposing such salt to suffer “ no change in the animal body, the effects “ of it may be considerable.” This must be readily allowed, though we should not be able to account for its operation.

But to prove beyond all doubt, that these provisions are hurtful from being salted, I will produce Lind's own words ; and which plainly shew, conclusions he has elsewhere drawn are by no means to be trusted on this subject. Nothing but the sake of truth could

could me make thus impeach the accuracy of the learned author. “ There are not wanting,” says he, “ instances of the good effects attending this method of putting the ship’s company, in long voyages, upon a very short allowance of salted meats. The following is too much to the purpose to be omitted, as it seems to demonstrate the utility of the measure by a comparative trial at different times of its effects.

“ In a former war, the men belonging to the Sheerness, bound to the East Indies, apprehensive of sickness in so long a voyage, petitioned their captain not to oblige them to take up their salt provisions, but rather to permit them to live on the other species of their allowance. Captain Paliser ordered that they should be served with salted meat only once a-week, viz. beef one week, and pork the other. The consequence was, that after a passage of five months and a day, the Sheerness arrived

“ rived at the Cape of Good Hope without  
“ having so much as one man sick on board.  
“ As the use of Sutton’s pipes had been then  
“ newly introduced into the King’s ships,  
“ the captain was willing to ascribe part of  
“ such an unusual and remarkable health-  
“ fulness in so long a run to their benefi-  
“ cial effects; but it was soon discovered,  
“ that by the neglect of the carpenter the  
“ cock of the pipes had been kept all this  
“ while shut. This ship remained in India  
“ some months, where none of the men, ex-  
“ cepting the boats crews, had the benefit of  
“ going on shore; notwithstanding which,  
“ the crew continued to enjoy the most  
“ perfect state of health. They were in-  
“ deed well supplied with fresh meat.

“ On leaving that country, knowing they  
“ were to stop at the Cape of Good Hope,  
“ and trusting to a quick passage and to the  
“ abundance of refreshments to be met there,  
“ they ate their full allowance of salt meats  
“ du-

“ during a passage of only ten weeks; and  
“ it is to be remarked, that the air-pipes  
“ were now open. The effect of this was,  
“ that when they arrived at the Cape, twen-  
“ ty of them were afflicted in a most mi-  
“ ferable manner with scorbutic and other  
“ disorders. These, however, were speedily  
“ recovered on shore by the land refresh-  
“ ments. Being now thoroughly sensible  
“ of the beneficial effects of eating in these  
“ southern latitudes as little salt meat as  
“ possible, when at sea, they unanimously  
“ agreed in their voyage home from the  
“ Cape to refrain from their too plentiful  
“ use of salted flesh. And thus the Sheer-  
“ ness arrived at Spithead with her full  
“ compliment of 160 in perfect health, and  
“ with unbroken constitutions: having in  
“ this voyage of fourteen months and fif-  
“ teen days buried but one man, who died  
“ in a salivation \*.”

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\* Essay on the Health of Seamen.

Having now amply refuted the notion that salted meats are innocent, it remains for me to consider the arguments in favour of indigestible diet producing scurvy. To support this opinion, the other species of a seaman's fare, as consisting principally of unfermented farinacea, has been mentioned. I will readily allow that the whole of a seaman's diet is hard of digestion: But to what purpose has this fact been employed by Lind and Milman? They themselves tell us, as I have already remarked, that crews living for months on this kind of provision without vegetables, have continued free of disease. Here was none of the consequences that follow a bad digestion, such as want of appetite, and emaciation of the body from not being duly nourished: And that this cause had no effect in producing scurvy, is very plain from the above quotation from Lind, where they really prevented it. Numerous instances might be produced to

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prove the same, too well known and too common to need repetition. But that debility of the digestive powers, so strongly contended for by Lind and Milman, is not essentially an attendant of the disease in question. The curious fact from Van Swieten is altogether frivolous; “to show how any  
“ indigestible matter, irritating and weak-  
“ ening the stomach, may be apt to excite  
“ this complaint.” Lind himself, in many parts of his book, mentions the soundness of the digestive organs; and in one part he says (after describing some of its worst symptoms), “Most, although not all of them,  
“ even in this stage, have a good appetite.” Ecchius, one of the oldest writers on scurvy, has these words: “The appetite is seldom bad; on the contrary, they have generally a good one.” From my own practice I must only remark, that all my observations tend to confirm this, as I have taken notice of in the account of the symp-

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toms :

toms : and as far as my reading of authors on the subject goes, the same thing is attested by the whole of them concerning the appetite and state of the stomach. Among the Negroes I found no signs of indigestion; on the contrary, the diet was highly nutritious, and the inveteracy of the disease seemed to be in proportion to the corpulency. But further, and to conclude my arguments on this head on principles established in pathology : That the functions of the stomach are entire, is confirmed from scorbutic patients indulging so long in the use of acescent vegetables without any symptoms of indigestion whatsoever. There is, perhaps, no disease incident to the human body where vegetables can be so freely used without their tending manifestly to debilitate the tone of the stomach. A small quantity of lemon-juice, and even too four punch, has been known to bring on a fit of the atonic gout : Persons subject to dyspepsia, are sure

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to have their complaints aggravated by vegetable acids: It is the same in hysteria and hypochondriasis, and in every other disease where the digestive organs are so immediately concerned. Whereas we find no such effects follow their use in scurvy, though the quantity of lime-juice taken sometimes, has been incredible. Upon the whole then I must observe, that a seaman's diet is not productive of scurvy from being hard of digestion; and that in scurvy there is really no symptom of a weak stomach present.

Such is part of the basis on which Dr Milman has built his theory. I shall now examine some other of the causes of scurvy which he has endeavoured to reconcile to his side of the question, that it is a disease primarily of the solids. ✓

Dr Milman is among the number who contend, that the scurvy was known to and described by the ancients. His arguments

on this part are certainly ingenious; and had they been satisfactory, must have served his doctrine: For if it can be produced by directly debilitating powers, <sup>these must</sup> ~~the~~ must exist at all times and in all ages. But proofs to this purpose are by no means convincing; and what I have already said on that head seems to me sufficient.

Among the arguments in favour of the scurvy depending on a diminution of the vital power, they tell us, that those are most liable to it who have been weakened by preceding diseases. This is admitted, that whatever debilitates the habit predisposes to scurvy. But to make their proof decisive, they should likewise have assured us, that the body was always in a weakened state at the beginning of the complaint; which is not the case: For in all instances where scurvy has raged to a high degree, we find not only the weak, convalescent, and valedudinary, but the most robust and otherwise healthy,

healthy, have suffered from its influence. I have myself seen what is called a *hardy seaman*, who treated the raw scorbutic landsman under his affliction with the most sovereign contempt, forced in a few days after to confess the attack of scurvy, when it was neither in the power of exercise or high spirits to resist its influence. Thus have the cheerful and the gay suffered in their turn on many occasions, so that nothing general can be admitted on this part of the remote causes. Dr Milman indeed seems to have been aware of this, and he has recourse to what he calls *the modification of the remote causes*. But the ingenious Dr Ferris \* has sufficiently shown the absurdity of applying this even to Milman's own theory: and to what he has said, I would add the singular cases of the lusty young Negroes, where no debilitating cause was acting to diminish di-

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\* See his Inaugural Dissertation, published at Edinburgh in 1783, p. 81.

rectly the vital power, or so modify this diminution in any manner as to produce scurvy. It seems to me, however, probable, that one state of the fluids may be produced by all the different causes hitherto mentioned; and such a one, I apprehend, may be accounted for as being the proximate cause of scurvy; while the phenomena of the disease are to be attributed to the action of the fluids on the solids.

Having now offered my objections to the ground of Dr Milman's theory; it will be necessary to examine on what authority he affirms, that the blood is altogether untainted in this disease.

Though Dr Lind has told us of the inveteracy of scurvy in those patients, the serum of whose blood he found insipid to the taste; yet he has not informed us how long these patients had lived on the hospital broths, or what quantity of fresh vegetable matter they had taken in from the time they had been

been on shore. The reason for my mentioning this is, that I suspect a small quantity of acrescent vegetables, would so far change or dilute the mass of blood, as to make a great part of what has been called *the preternatural saline state* pass off by the various excretions, otherwise naturally disposed to be carried off by these emunctories : and the recovery of scorbutics is so very sudden sometimes, after the use of lemons and oranges, and the taking in of fresh nourishment, that this is likely to be of some consequence. But if common salt, as Lind has said in another place, can actually circulate in our fluids, how could the taste of the blood be insipid while the salt remained there unchanged ? These are at least bold proofs that his experiments are not decisive.

In the postscript to Lind's book, we also find from his account of dissections, that in dropical collections of the breast the fluid was so acrid as to whiten and shrivel the skin

of the person who dissected the body; and in some instances, where the skin of his hand was broke, it irritated and festered the wound. It will scarcely be argued that this fluid acquired such a degree of acrimony during its stagnation in the cavity of the thorax, or that the exhalant vessels could possibly so alter it in pouring it out. I shall, however, employ it as a presumptive proof, that this acrimony existed in the mass of blood; because we do not find in the records of medicine, that any practitioner ever found so singular an appearance in dropsies from other causes. And was I to *theorise*, if I may be allowed the expression, a little farther on this fact, I would say, that the superabundant animal salt in the blood was the cause of every slight division and irritation of the skin being so apt to degenerate into foul ulcers. The corrosiveness of the effused fluids in some scorbutic dropsies, is also confirmed from Poupart's dissections, where

where it was found of different colours, and so caustic, that putting their hands into it, the skin would come off attended with heat and inflammation. In the joints also was found a greenish liquor, which by the same quality even corroded the ligaments. Had Dr Lind tasted a fluid of this nature, I will venture to affirm it would have left an impression on his palate very different from insipid.

The late Dr Young, in his celebrated Thesis on Milk, remarks, That if an animal feeds on a vegetable diet, the milk will be saccharine and acescent; if upon animal, no sugar will appear in that fluid, but on the contrary it will be putrescent. On our passage from Africa to the West Indies, a Negro woman giving suck, began to complain of spongy gums and some other symptoms of scurvy. It would have pleased me much to examine the state of the milk in the advanced stage of this disease; but the

arrival of the ship at Antigua prevented me from putting the matter to a final experiment.

Although it would be impossible to demonstrate that our fluids are in a state of actual putrefaction, I see no reason why we should not retain the term while the remote causes account for it. It appears perfectly consistent with our ideas of an animal body, that by living for a long time on a flesh diet, our fluids may acquire a tendency to putridity. We know that the animal process can assimilate all vegetable food; but we know no power in our bodies to overcome the too great quantity of animal diet, unless by a due supply of fresh vegetables. The following paragraph, elsewhere quoted, is so perfectly consistent, that I shall not hesitate to make use of it: “All our  
“ fluids have a natural tendency to putre-  
“ faction; in order that they may be pre-  
“ served from a morbid putrescence, there  
4 “ must

“ must be a continual renewal of them by  
“ fresh chyle, and an expulsion of those  
“ particles in which corruption is begin-  
“ ning. If there be not such a constant ac-  
“ cession of fresh food, our fluids soon fol-  
“ low their own nature; and, as an addi-  
“ tion to the evil, this want of nourishment  
“ must deprive the constitution of that de-  
“ gree of plethora which is requisite for  
“ carrying on the secretions and excretions.  
“ Hence those parts of the blood which  
“ were degenerating into putrefaction, in-  
“ stead of being expelled by some of the  
“ emunctories, will be accumulated; and,  
“ like a leaven, soon spread their influence  
“ through the whole putrescent mass \*.”

Experiments made on the blood out of the body are never to be admitted in explaining this wonderful secret of the animal œconomy; for we neither know on what depends the coagulation of our blood,

or

\* Milman, Lond. Transac. Vol. II.

or what effects certain properties of the air may have in retarding the putrefactive fermentation of the vital fluid when drawn from its vessels. This is illustrated from several excretions being really more fetid when first separated from the body, than they ever come to be afterwards on exposure to the atmosphere, &c.

When we take a survey of the causes of scurvy, and how seldom it has appeared unless where the diet was in fault, and the few solitary cases related of it occurring where plenty of fresh vegetables were used, with moderate exercise, we can the less admit the conclusions of Dr Milman. That there is a great debility present with the disease, is not to be denied; but of so peculiar a kind, that nothing seems analogous to it. In proof of this, I need only mention how little advantage has been gained by the use of the cold bath, mineral acids, and the celebrated Peruvian bark; the latter of which

which I have given at the rate of an ounce to eighteen drams in a day, but never observed much good from it in a real scorbutic ulcer: whereas, in the space of twenty-four hours after the use of a small quantity of lemons or oranges, the sore has put on a healthy appearance; and it is well known in practice, how rapidly some large scorbutic ulcers will heal when the patient comes to live on fresh vegetables.

What Milman has said on the hospital broths with regard to the cure, will not at all serve his theory; for a nutritious food is not essential to the cure of scurvy. These broths, when served to scorbutic patients, are full of greens and other vegetables in season, which of themselves are sufficient to overcome the disease; unless the habit previous to the attack of scurvy was in a weakened state, or if it came to be so as the disorder advanced, this nutritious composition will only then be necessary to the cure. The  
scurvy,

scurvy, in numerous instances, has been cured on ship-board, where nothing but the common esculent vegetables and acescent fruits were used; as in the following. About the end of May 1780, the Berwick of 74 guns, sailed for the West Indies, in a squadron under the command of the brave and unfortunate Commodore Walsingham, who perished in the Thunderer in the memorable hurricane off Bermuda the October following. On the third week from our leaving England, some of the men began to complain of a stiffness of the knee-joint, sore gums, and some other symptoms of scurvy. The beer had been now done a week, and the water was served to the crew at allowance of so much per man a day. When we came to Jamaica, notwithstanding we got some refreshments to windward, thirty-five of our crew were tainted with scurvy. The passage from the Lizard was not more than eight weeks, and the weather

weather so remarkably mild, that there scarce fell a shower while we were at sea. The Royal Hospital at this time was so full at Port Royal, as to be unable to receive any more; so that it only remained for us to cure them on board. I accordingly solicited the commanding officer to permit the sick to exchange their salt provisions with the black women for vegetables: which was complied with: and I stood by, to take care no liberty was taken with this indulgence. The happy consequence was, that in ten days they all returned to duty.

That state of the pulse which Milman takes notice of under the great authority of Baron Van Swieten, is confirmed by no other author of credit. While such a debility prevails in the system, we must expect a weak circulation: but I could never draw any general conclusions from the state of the pulse; and it has been little regarded in  
practice

practice by those who have been most acquainted with the disease.

The notions of a humoral pathology having been so justly condemned in accounting for the various phenomena of diseases, it has seemed matter of surprise to some, that the putrescency of the fluids should still be contended for by Dr Cullen; more especially since to him, in a peculiar manner, we are indebted for our present method of investigating the causes of diseases. Whether in all cases this new doctrine can be admitted, a more successful method of cure can alone determine. In an ingenious thesis published at Edinburgh in 1783, intitled *De Sanguinis per Corpus vivum circulantis Putredine*, Dr Ferris undertakes to vindicate the opinions of his great master: to which, for a full pathological discussion, I must refer the reader.

In his theory of scurvy, the illustrious Professor of Edinburgh has overlooked that

it ever occurred after living on other kinds of diet besides one of salted meat: on which account, if the proximate cause he assigns is to be admitted, it must be differently accounted for. The history I have given of the Negroes, and which I have faithfully related, seems still more repugnant to Dr Milman's side of the question; but there is something in the œconomy of the Negro that may assist us in part to reconcile it to Dr Cullen's idea of a preternatural saline state of the blood. I have often observed in the Negro the sudden transition from leanness to obesity, and the contrary. This disposition to grow fat so rapidly, especially when restricted from exercise, seems much owing to the nature of their food; which is almost vegetable, and consequently yields a greater quantity of perspirable matter. For the better containing this perspirable matter, nature, for purposes we need not explain, has provided them with a greater

proportion of cellular membrane than is to be found under the surface of the inhabitants of any northern region; and hence that sleeky softness of their skins so often mentioned. If then this excretion is retained from want of due action of the body, there can be no doubt of its accumulating an over-abundance of ammoniacal salt in the blood, unless carried off by the kidneys. It has been remarked by some practitioners, and these of no small note, that in suppressions of urine it is apt to be carried to the brain; and, in dissections, the urinous taste has even been discovered in the ventricles. Whether the perspirable matter being of a like nature might do the same, is only offered as conjecture; and in some measure may account for the delirium formerly taken notice of. That there is something, however, peculiar to the cutaneous discharge of the Negroes, I must still assert; and to prove it, let me relate, that I have  
seen

seen persons, whose olfactory nerves were uncommonly delicate, forced to fly from the street of Kingston in a market-day to avoid the intolerable effluvia.

That longing desire for fresh vegetables in scurvy is so wonderful, that I am surprised it has not yet been the cause of more speculation. And if there was no other argument in favour of a vis medicatrix, or an effort in the system to obviate the effects of noxious powers, this must be a convincing one; for it dictates the very method of cure. Ripe fruits, that have lost their acidity, are not desired with the avidity that green ones are; and this will be the more astonishing, when I relate the following experiment. Having repeatedly observed the scorbutic slaves throw away the ripe guavas, while they devoured the green ones with much earnestness, I resolved to try which were most effectual in the cure; and accordingly selected nine Negroes, affected nearly in a

similar manner with this disease. To three of them I gave every day limes; to three, green guavas; and to the other three, ripe ones. After they had lived in this way for a week, I was surpris'd to find little alteration in those that had taken the ripe guavas, while the other six were almost well \*. Whatever then is that quality of green or acescent fruits and vegetables in the cure of scurvy, proofs of this kind may not only lead us to a more certain means of relief, but

\* While I was a surgeon's mate in the Berwick, after the long cruise of Sir Charles Hardy's fleet in the Bay of Biscay at the beginning of the Spanish war, when we came to Spithead in September, a few of our raw sailors were tainted with scurvy. As it was not thought necessary to send them to the hospital, they were permitted to go ashore to the Isle of Wight, for the benefit of air, exercise, and what fruits they could get in the woods, under the command of an old seaman, who pretended great skill in knowing antiscorbutic herbs; and it was remarked, that what they used were always of the acescent kind.

but assist us also in explaining their mode of operation within the body.

This singular circumstance I noted among the Negroes, that during the cure, and from the use of the limes, &c. an emaciation always took place, though different in degree. Whether this was owing to any other cause than these fruits exciting a gentle diarrhœa, I will not pretend to say; but about the time that the scorbutic symptoms disappeared, the emaciation went no farther: And the slaves in this situation were allowed a meal extraordinary, to recover their former shape for a better market.

Several instances are related by Dr Lind, of scurvy being known on board of ships in harbour, while the crew were living on fresh beef and broth. I have myself met with the same; and the most obstinate contraction of the ham I ever saw, was in a sailor who had got the complaint while the ship was at Spithead. Such cases, how-

ever, are no detraction from the general rule; and if circumstances are minutely examined, they will not invalidate my assertions. For these scurvies can almost be always traced from some taint contracted at sea, which the small quantity of vegetables taken in had not been able to overcome; and these in their turn have always yielded to the established method of cure. The quantity of greens that is commonly mixed with the ships broths is really so trifling as scarce to deserve the name.

Whatever credit the learned Dr Milman may have gained for his opposition to the doctrine of antiseptics (and no small share is certainly due to his ingenuity), facts are still against him in applying it to the prevention and cure of scurvy. In whatever manner the body is affected, or whether or not there is a septic tendency in the fluids, we are well assured from universal experience, that what generally pass by the name  
of

of antiseptic remedies, are not only the most powerful in the prevention, but the only ones to be depended on in accomplishing a cure. And though Dr Lind affirms that they act as diuretics and sudorifics, I must still contend, that is only owing to their increasing the bulk of the fluids from their watery principle.

To account for the whole phenomena of scurvy on any principles we are yet acquainted with, must be an arduous task. But as the new doctrine delivered by Dr Milman, if adhered to, must have a dangerous tendency in regard to the prevention and cure; and as it has been conveyed in a more specious train of reasoning than is commonly met with in medical researches, it seemed the more necessary that it should be stripped of this disguise, and exposed to inquiry. It will be now but justice to add, how much Dr Cullen deserves to be commended, for still retaining the doctrine of

✓ the fluids as the proximate cause of scurvy, till it can be better accounted for on other principles.

It was my intention to have offered something more on the theory of this disease; but as my own experience has but partly satisfied me, for the present I shall draw no conclusions from it.

SECT.

## SECTION III.

AFTER what so many able physicians have said on the prevention of scurvy, a disease whose causes and cure are so well ascertained, it may seem astonishing that it should still be the scourge of long voyages and a sea life. It is allowed, that all disorders are easier prevented than cured; but here it must be the more so, since what is of most consequence in the cure is not always to be commanded at sea. Every one that has been conversant with the necessary duties

ties of a sailor during the inclemencies of weather and climate, and the few indulgences his situation admits of, must be convinced that little is to be done in this way towards the preservation of health. Those means then ought to be put in execution which from our acquaintance with a sea life can be commanded on all occasions.

During the late war there have not been wanting many instances to prove, that this dreadful disease still continues to make ravages in our fleets and armies. For the benefit of the public and information of physicians, it is much to be lamented some plan has not been undertaken to collect the scattered observations of the physicians to the different Marine Hospitals and Navy Surgeons, concerning the occurrence of scurvy in every ship, and under what circumstances it has been most fatal.

We are now convinced the influence of cold and moisture, on which Lind lays so  
par-

particular a stress, is not absolutely requisite for the production of scurvy. What effects the retained perspirable matter may have in our bodies without the concurrence of some other cause, has not hitherto been specified. A moderate degree of exercise, however, is certainly necessary, not only for promoting the excretions of perspiration and urine, but perhaps for other purposes equally important to health. The body being employed from its action on the mind, has the effect of preventing that train of ideas that lead to thought and all the sedative passions which operate so powerfully and successfully in the production of this disease. This naturally brings me to lament the horrors that attend the present method of recruiting our navy by impressing the seamen. No description is able to convey an idea of the cruelties with which this part of the service has been attended. Let us only figure to ourselves a company of sailors returning  
from

from a long voyage, after braving all the vicissitudes of climate and season, in sight of the wished-for port, and feeding themselves with the expectation of enjoying the sweets of their labour after so long an absence from their friends, all at once forced and carried on board a ship of war, perhaps ordered the next day to a foreign station; where, if the impressed sailor is unfortunate enough to have either reflection or feeling, he falls a victim to the disease, the havock of which I have been describing, or some other equally terrible in its consequences. Amidst all the plans of œconomy and reform that have lately taken place throughout the public departments of this country, it seems wonderful indeed no happy invention has appeared to produce so salutary a measure as to constitute a naval militia: A measure that not only must secure the mercantile concerns of these kingdoms from foreign foes, but ensure the merchant

chant from the thoughts of having his property destroyed for want of men in time of war to navigate his vessels.

Another circumstance highly concerning the health of seamen in the recruiting service, is the entering and impressing men unfit for any species of duty on board of a ship of war. This inattention, during the late war, by being overlooked, cost Government annually many thousand pounds. I have attended scurvies at the Royal Hospitals, where men have been invalided as unfit for service, after being two or three times discharged before in the course of twelve months; and, at an average expence each time, they must have cost Government from ten to fifteen pounds. This was so glaring among the volunteer seamen voted by the Irish Parliament, that above one thousand invalids were actually returned to their own country in the space of eight months from our hospitals.

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To remedy all this, I would only observe, whether it would not be of some consequence to appoint a navy surgeon at every port where a regulating captain resides. A man that has been acquainted with a sea life, the disposition and health of seamen in different climates, is the only member of the faculty fit to be trusted in such an employ.

Before I leave this part of the subject, it may not be altogether foreign to the purpose to offer some remarks on the practice of charging fifteen shillings to seamen for the pay of venereal cures by the surgeons of his Majesty's ships. This will be the less exceptionable here, as the effects of syphilis have been often complicated with scurvy; and the scenes of misery they have together produced, exhibited views of the utmost wretchedness in both our ships and hospital. I hope, however, from what I am about to inculcate, that no one will suppose I

wish to introduce innovations to the service that could tend to spread filth and disease, or destroy health and every species of virtue and morality in our ships of war. I shall only attempt to show, that the present method of conducting the service in this particular is absolutely destructive to the health of seamen, and inconsistent with every generous principle and liberality of sentiment that have ever distinguished a British government.

Since the introduction of the venereal disease to Europe, it has in a peculiar manner been the scourge of the profession of arms. The roving life of the sailor and soldier has singularly subjected them to its virulence; and the difficulty of cure, as it was till lately thought to be, induced the surgeons of his Majesty's navy to petition the Board of Admiralty for some perquisite annexed to their office for every cure on ship-board; which the King in council ordered to be paid out of the seaman's wages.

Why

Why the purse of the poor sailor should be scourged for his iniquities, I know not ; or why, in a moral sense, he should not as well pay for getting drunk and wounding himself. If ever it was meant to curb the desires of the sailor, it certainly has failed in the intention. That fifteen shillings for a venereal cure ever prevented a sailor from indulging his pleasures, none conversant with their disposition will admit ; but that it will prevent them from applying for relief till they can do no better, melancholy proofs may be produced. When we consider how simple the method of cure of every venereal complaint is when taken at its first appearance, and how little is to be done in the advanced stage of that disease on board of a ship while the sailor is obliged to live on salted provisions, and exposed to all the inclemencies of weather and season ; it will readily be allowed, that the cure by these means may become worse than the dif-

disease \*. Hence those disorders so frequent to English seamen in warm countries and long voyages from a worn-out constitution, and that rotten old age so early to be found among them.

Some of these hints were laid before the Society of Navy Surgeons at Plymouth three years ago; and as an equivalent for the surgeons giving up this perquisite, it was proposed, that government should increase the half-pay to the senior surgeons, and put the whole number on the half-pay list. It would at the same time be the means of removing some ungenerous aspersions that have fallen on the medical character in the navy; and was it necessary to show that these animadversions are not built on mere speculation, I can bring facts innumerable to attest the necessity of altering a custom so

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\* The destructive effects of mercury in scurvy have been long known to our navy surgeons.

incompatible with humanity, and the health of so valuable a part of society.

I hope it has been sufficiently proved, that the occurrence of scurvy at sea is owing to a diet of salted provisions; and therefore to prevent it, we must either substitute another in its place, or provide the seamen with something capable of correcting the hurtful qualities of this kind of food.

For the prevention of scurvy, our navy is at present supplied with elixir of vitriol, four krout, and essence of wort. The first of these, recommended by the late Dr Huxham, has been a long time used; and it seems to have been introduced to practice from that desire for acids congenial to the disease. But we are still left to doubt of any effects the elixir of vitriol possesses in the cure of scurvy. And, indeed, while we hold some fault of the blood to be the proximate cause, the disappointment need not excite our wonder, since it is incapable  
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of being converted into animal fluids. Had that debility of the digestive powers been present, which Dr Milman alleges, from the consent the stomach has with the rest of the system, it must have been a powerful medicine. The same reasoning may also be applied to our disappointment of the effects of the cortex Peruvianus: If the patient at the attack of scurvy was sick or convalescent, bark, as being the most powerful tonic, has always been joined with what are called *antiscorbutics*; and in these cases alone, it seems to have been given with success. The cortex given by itself, from the authority of all practitioners, has never done much here; which is to be imputed to its exerting its powers on the nerves of the stomach, and not in the circulation.

Our ships of war were first supplied with four krout from the recommendation of Dr Lind after the fashion of the Dutch navy. But if it had possessed any great antiscor-

butic properties, our ships have never been supplied with it in quantities equal to the purpose. And I am apt to believe there is very little of that quality in this preparation of cabbage which we value for the prevention or cure of scurvy. On opening the casks which hold the krout, an effluvia flies off, which is so intolerable as to smell fetid and disagreeable at many yards distance: a proof that it has partly undergone the putrefactive fermentation; besides, it may be hurtful from the salt it contains: and I apprehend it would be advantageously superseded by some other preparations hereafter to be mentioned.

The essence of wort and infusion of malt, among the list of antiscorbutics, are indebted to the ingenious Dr Macbride for the praise that has been bestowed on them. Perhaps their virtues are more to be trusted in the prevention than cure of scurvy; and for both they fall short of the intention of the benevolent author. Captain Cooke found the  
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essence of wort unable to cure the advanced stage of scurvy; which was also confirmed from trial by Dr John Clarke when surgeon to the Talbot East Indiaman. Our ships of war are now supplied with it at a very great expence; and when served to the sailors, they are deprived of their grog or wine, if the beer is done: a circumstance not favourable to its being duly taken. I have repeatedly seen the wort given in great quantities; and though it seemingly retarded the progress of the disease, I doubt much if it deserves half the applause that has been bestowed on it to accomplish a cure.

To the last mentioned articles comes next in rotation the celebrated aërial acid. But, notwithstanding the boasted effects of fixed air in the cure of scurvy, it is highly probable they are still greater in speculation than practice. Perhaps no medicine whatever was ushered into repute under the sanction of such repeated plaudits as the aërial

acid ; and some of its abettors have even gone so far as to hazard probability in its praise, in applying it to the cure of such numerous disorders. Several instances are given of its producing a cure of scurvy on shore ; but we are not well informed what kind of diet and regimen was ordered to the patient at the same time : and authors are too apt, on certain occasions, to attribute to a favourite medicine, in these circumstances, what really had no share in producing the effect. The power it possesses of sweetening fresh water is so far in its favour ; but if we are to trust to fixed air at sea, and forget other precautions, I suspect so dangerous a mistake may be productive of the worst consequences. Whatever experiments are made out of the body to ascertain the antiseptic qualities of this acid, are as little to be trusted in practice as all others : But, while so many have extolled the virtues of this antiscorbutic, our sea-surgeons have been silent

on the subject. It is most likely so simple a relief, and one that can be commanded on all occasions, has not answered the eulogiums conferred on it, otherwise we must have heard of its success. In all the trials I have made of it, I was so early disappointed, as to lay it aside altogether; and from all the inquiries I have made among my acquaintance, this has been the result of the use of fixed air in the navy.

During the late war a remedy has been made use of, called the *earth bath*. A hole is dug in the earth, and the patient is covered up to the chin, where he remains for the space of half an hour. This hint was taken from sailors burying their limbs in the sand when sent on shore for the benefit of air and exercise. For the contraction of the ham it has been particularly recommended; but when tried without the use of vegetables at the same time, it has only amused.

Having now shown, that the present method of supplying our ships of war with preventatives against the scurvy is not to be trusted on all occasions, it remains for me to recommend some that are likely to prove effectual.

In the first place, it is much to be wished that the commanders of his Majesty's ships, on a man of war going to sea, and till she returns to port, should order the allowance of beef and pork to be diminished. The good effects of this custom are too well known to be further insisted on. An officer, with a surgeon's mate, ought to inspect the mixing of the bargain every morning, taking care that a sufficient quantity of molasses is added to make it palatable. The want of this necessary piece of attention has, I believe, been the chief cause why so little of this part of a sea-diet has been made use of: and besides its containing a large proportion of vegetable matter, the quantity

tity of water taken with it may be of some consequence.

To correct a salted diet, instead of four krout, I would recommend pickles of onions, red cabbages, cucumbers, &c.; these, as costing the sailor no trouble in preparing, and as being savory when taken with salt beef and pork, are likely to be used with pleasure. Another valuable article I could wish to see introduced as a part of our seamen's diet on certain stations is, gooseberries, preserved in the same manner as for culinary purposes. Half a pound of these berries, served two or three times a-week and on beef days, is a measure likely to have some effect. If these berries are gathered about the end of June before they grow sweet, and properly prepared afterwards, they may keep for years in any climate, while the expence is too trivial to be considered for so valuable a purpose.

To add still further to this part of a seaman's

man's diet, it would certainly be a most eligible method to convert the grog into punch. This can always be easily accomplished, by coarse sugar and lemon-juice, or cream of tartar. Grog is never served to a ship's company till the beer is drunk out, by which time the water is generally in short allowance, and often putrid, which loudly calls for the propriety of such alteration.

Although the juice of lemons and limes is so well known a remedy in scurvy, it is still doubted if any preparation we can carry to sea preserves their virtues entire. Captain Cooke found the inspissated juice, as procured by evaporation, and recommended by Dr Lind, of little or no efficacy in the cure of this disease. But I verily believe this may be accounted for: besides the water carried off by vapour from this preparation, we know not what other changes it may undergo by heat; and it likely by that means loses what we would most value it for.

for. It remains therefore for us to find a method of preserving the fruits, or their juice, as nearly as possible to their native state. For this purpose, having squeezed a sufficient number of lemons, I strained the juice through a linen cloth, and put it into quart bottles, covering it with a little olive oil; then corking the bottles securely, so as perfectly to exclude the air. It was set in a cool place of the ship; and after fourteen months keeping on the coast of Africa, was given to some scorbutic slaves with the same success as fresh limes: its acid taste was perfectly entire; and punch made from it was not distinguished from the new lemon. So that difficulties in preserving this juice for any length of time are very frivolous: And perhaps those who have the immediate direction of the victualing our navy, may one day think such a plan no inconsiderable addition to the preservation of the health of our seamen in long voyages.

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When our ships are stationed in tropical countries, they may at all times command these fruits for a trifle; and when we consider how easily they may be procured, we may well wonder our seamen have not been liberally supplied with them at the expence of government. The biscuit in these latitudes soon spoils, and becomes full of maggots and weevils, which certainly render it unwholesome: and would not this bread be well superseded by fresh plantains and yams, which are by many preferred even to new bread in the West Indies. These articles would not cost above half the expence that the biscuit does in England; and they would be of the more importance, as meals of fresh beef are seldom or never met with in the West Indies on board of our ships of war.

The influence of cold and moisture, as already mentioned, seems to deserve less attention than has been bestowed on them;

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as it has made us look for assistance in the prevention of scurvy from methods incompatible with the duty and life of a sailor: it will, however, be always prudent to avoid them if possible. Had Dr Milman searched for the true cause why petty officers are less subject to scurvy than the seamen, he would have found it much more owing to a difference of diet than any other mode of living whatsoever.

People recovering from sickness on board of a ship, ought not to use the common sea fare till fairly re-established in health. The quantity of portable soup given to each ship has always been a sufficient allowance; and if a small proportion of barley, shallots, or garlic, as supplied among the surgeon's necessaries, is added, they can always have a comfortable subsistence. In addition to these articles of diet for scorbutics and convalescents, I would beg leave to recommend a mess of flummery, or *sorwens*, as it is called

ed in Scotland, where it is most used. It is made of oat-meal, which, with water, undergoes a slight degree of fermentation; it is then strained, and boiled to a certain consistence, stirring it all the while. By mixing with this preparation a small quantity of wine and sugar, or molasses, it can be made a dish fit for the most delicate palates. During the late war, sowens have been fashionable in many of our ships; and some of the most distinguished commanders, as an example to the men, have constantly used them for a sea supper. If the manner of preparing them in this way on board of a ship should be disagreeable, officers and others may have them made on shore, and put up in a portable form. When the grosser parts of the oat-meal are separated, the fine farina falls to the bottom of the vessel, from which the water may be evaporated and formed into cakes, which ought to be preserved in close casks,

and kept dry. To a pound of this preparation may be added three or four times as much water, and boiled to the consistence of jelly.

A particular care in the prevention of scurvy is to be taken in our transports carrying troops abroad; and they ought to be well provided with every article for that purpose. This is the more necessary, as these vessels are always much crowded, nasty, and ill-aired; but what is still adding more to the urgency of these precautions, is, that the raw soldiers, being unaccustomed to sea, are the first sufferers from a salted diet. This is sadly proved, from the mortality among troops on board of transport ships, lying for a long time before besieged garrisons, and in long passages to our different settlements.

I shall now conclude, with offering some remarks on the means of preventing scurvy among

among the Negroes on board of the African merchantmen.

The most knowing in this trade are aware of how much consequence it is to complete their purchases as soon as possible; therefore a ship to carry from three to four hundred slaves must be preferable to one larger, as less endangering the health of the cargo from lying too long on the coast with the Negroes on board. The diet ought to be rather spare than otherwise; at least to those who are in good condition. Ships in the road at the time we were purchasing our cargo had their slaves as long on board; but by giving them less victuals, preserved them healthy and free from scurvy. This spare diet should be continued till they are about to leave the coast, when it may be increased; and the utmost attention is to be paid to its quality. The corn rooms are to be frequently inspected, and kept as airy as possible. The corn, during the day, ought

to be carried upon deck, to prevent its growing damp and mouldy. Guinea pepper may be mixed with their food in any quantity; it is the natural condiment of this kind of food, and may obviate a number of complaints, such as gripes, purgings, &c. which are oftener owing to diet than any other cause. Palm oil is also used in great quantities by the inhabitants of Guinea; and as being nearer of an animal nature, is of infinite service to assimilate all vegetable food. The fruits of the climate, whenever they can be procured, ought to be freely distributed among them \*. Of how much

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\* When a ship leaves the coast, she ought to be well provided with all the fruits in season. The passage of a Guineaman to the West Indies is seldom so long, but limes and oranges may be preserved all the way; but if there is danger of them spoiling, the juice can be preserved, as formerly directed. There are many instances of ships in this trade, where, from scarcity of water in unavoidable long passages, the scurvy proved destruc-

consequence due exercise is in preserving a healthy cargo of slaves, the want of it has duly shown. There should therefore be no more of them in irons than the absolute safety of the ship requires; and the whole of them are to be danced on the deck to the sound of a drum, of which they are very fond, for an hour twice in the day. Small windfalls ought to be used for the better airing of the rooms; and by trimming them to the wind occasionally, they will be of more service than air ports, which are always shut at sea, when there is most need of them. Cleanliness is another object, and of no less importance: the rooms ought to be well washed twice a-week, and well dried with fires while the slaves are upon deck. The slaves should also be ordered to keep their

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destructive to the slaves, when a few casks of lime juice might have saved them. Such was the case of the *Molly, Kendal*, as I have been informed by Mr Grogan, an ingenious medical gentleman then in that ship.

skins clean, by washing themselves as they come upon deck in the morning: and if all these precautions are duly attended to, this fatal disease will feldom be met with in a Guineaman.

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being clean, by washing themselves as they  
 come upon deck in the morning; and if all  
 these precautions are duly attended to, the  
 fatal disease will seldom be met with in a  
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