





Johannes  
Cranford  
M.D.









*Johnston*  
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A  
T R E A T I S E  
ON THE  
S C U R V Y:

CONTAINING  
A NEW, AN EASY, AND EFFECTUAL METHOD  
OF  
CURING THAT DISEASE;

THE  
CAUSE, AND INDICATIONS OF CURE,  
DEDUCED FROM PRACTICE;

AND  
OBSERVATIONS CONNECTED WITH THE SUBJECT;

WITH AN  
APPENDIX,  
CONSISTING OF FIVE LETTERS, RESPECTING THE  
SUCCESS OF A NEW ANTISCORBUTIC  
MEDICINE.

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By D. PATERSON,  
SURGEON IN THE ROYAL NAVY.

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Crawford



TO

GILBERT BLANE, M. D. F. R. S.

PHYSICIAN EXTRAORDINARY TO HIS ROYAL HIGHNESS  
THE PRINCE 'OF WALES, AND PHYSICIAN TO HIS  
HOUSEHOLD ;

ONE OF THE COMMISSIONERS FOR SICK AND WOUNDED  
SEAMEN ;

AND

PHYSICIAN TO ST. THOMAS'S HOSPITAL ;

The following pages, offered in purpose to introduce a new, an easy, and effectual method of curing the Scurvy, and, consequently, of promoting the welfare and happiness of the Royal Navy, are,

With Gratitude and Profound Respect,

Addressed,

By

His Most Obedient,

Very Humble Servant,

THE AUTHOR.



## PREFACE.

THE prevention and cure of disease being objects of the first importance, it is presumed an attempt towards removing and obviating the scurvy will not prove altogether unacceptable. Under this impression, and considering it a duty incumbent on every person to communicate whatever he thinks may prove useful, this treatise is, with deference, offered to the public.

In the years 1779, 80, 81, 82, 83, and 84, on the coasts of America and Africa, and in the East Indies, I had opportunities of making observations on the diseases incident to seamen. In the year 1793, I was appointed to His Majesty's ship Resolution ; in which, the following year, having

ing the honour to accompany Vice Admiral George Murray to America, and still being very anxious to ascertain many points relative to the scurvy, as well as some other diseases, I renewed my observations and experiments.

In the passage to America, which was tedious, the scurvy soon making its appearance, I was, from reasons, which will afterwards appear, induced to try a solution of nitre in common vinegar, in several cases of the disease; and, with inexpressible pleasure, I saw it succeed. I say inexpressible pleasure, because the opinions I had long entertained, not however without my doubts, were now grown into facts; because I was satisfied that the scurvy might be cured, at sea, without the assistance of recent vegetable matter, a discovery

very

very which I conceived might turn out to be a national advantage.

On the 7th of December 1794, after having experienced the extraordinary effect of a solution of nitre in common vinegar in restoring above eighty seamen from the scurvy, I presented the result of my practice, in a long letter, to Admiral Murray, with what then appeared, and still appears to me to be the cause of the disease, and such observations as, at that time, seemed necessary for the good of the public service.

The letter alluded to, with additions, in which is included the appendix, consisting of five letters respecting the effect of a solution of nitre in common vinegar, in removing the scurvy, constitutes the present performance, which will, I hope, be  
found

rious stations, and in opposite climes, I have had frequent opportunity of observing this disease, in all its variety; and, at times, obliged to witness it, in all its hideous shapes, without having it in my power to put a stop to its destructive career.

Such scenes, and such reflections as these, are well calculated, if any thing is, to render medical men attentive. I have felt their effect.

Having been in the habit, for a long time past, of dividing my lists of scorbutics; of putting them on different plans of cure; of carefully making remarks; and of comparing what came under my own eye with what others advanced, I  
have

have been enabled to consider the disease in fundry points of view.

In perusing the publications of different authors on the scurvy, I have found, that, on some heads, they differ. Some lay great stress on cold and moisture; and others on salted provisions. Some consider the scurvy as a disease of the solids; others of the fluids. And, what is not a little surprizing, although they disagree in opinion about causes, particularly the proximate cause of the scurvy, yet, in the prevention and cure, they all tend, by similar ways, to the same point.

In former times, vegetables were considered as principal remedies in the scurvy; and, also, in our own day, it must be pretty generally known, that authors have

particularly recommended, and with good reason, lemons, limes, and oranges, as powerful antiscorbutics. Dr Trotter, indeed, building his theory on the deficiency of recent vegetable matter alone as the cause of scurvy \*, which Dr Bachstrom did nearly a century ago †, holds such matter, more especially lemons, limes, &c.

\* Dr Trotter, in speaking of the causes of the scurvy, says, "But it is particularly owing to the scarcity of recent vegetable matter; and where it abounds, the disease is never known." Trotter on Scurvy, p. 40. 2d ed. Again, "The occasional or exciting causes of scurvy have been called a diet of salted or smoke-dried provisions, without fresh vegetables. But we have considered a deficiency of recent vegetable matter alone, as the occasional cause of scurvey." Trotter on Scurvy, p. 171,-2. 2d ed.

† I never saw Dr Bachstrom's treatise; but that such was his opinion, we have the authority of Dr Lind; and



&c. essential to the cure of the disease.

But, allowing these fruits, in their recent state, well calculated, with other means, to remove the disease, yet, considering they are not at all times to be obtained, and when obtained very soon go to decay; and that the juice of any one of them, whether in bottles, or in casks, very soon loses, at least, a very great part of its original quality and virtue, they cannot be depended on, in long voyages. Similar observations might, with

and also, of Van Swieten, who, in his commentaries upon Boerhaave's aphorisms, p. 288. Vol. XI. 2d Ed. quotes from Bachstrom's *Observ. circa Scorbut.* p. 12. et seq. "That the true and primary cause of the scurvy is no other than a too long continued abstinence from fresh gathered vegetables or garden stuff."

with propriety, be made on all kinds of vegetables that have been proposed as antiscorbutics.

From all these circumstances, I have been prompted not only to investigate the cause of the Scurvy, but also to search for remedies that might at all times, and in every situation, be obtained, and without difficulty preserved.

So far back as the year 1784, in the latter part of a voyage from the East Indies to England, which, if something extraordinary does not intervene, shall be more particularly mentioned at a future period, I began to view the scurvy in a very different light from what I had before seen it, and to consider it as the produce of contaminated, poisonous, or foul air.

But

But, although my thoughts were then turned into a new channel highly flattering, yet, not being in possession of a sufficient stock of facts, to carry me clear of the difficulties that were frequently occurring, I moved with diffidence and caution; and my progress was slow. The farther I advanced, the more was I convinced that time and industry were required to gain a satisfactory knowledge of the subject.

In that voyage, from very different motives to what have influenced me for some time past, I tried, among other medicines, Nitre, which was pushed to a considerable length; and, as I thought, not without being useful.

It was some years after, when my  
knowledge

knowledge in medicine became somewhat more extensive, in taking a retrospective view of my practice in the scurvy, that I supposed nitre to have operated very differently from what I at first imagined. I now presumed, that the good effects of nitre, in mitigating, or in removing the scurvy, were to be accounted for, solely, from the dephlogisticated or vital air it contained; and, that it might be rendered more active by being combined with an acid.

At this time too, in taking a review of the various medicines I had, at different times, administered, in cases of the disease, I was induced to compare their effects; and, to me it appeared, that scorbutic people were either not so easy, or the symptoms under which they laboured so readily mitigated, by any thing heating,  
all

all other circumstances being the same, as under things, commonly said to be, of a cooling nature. It also appeared that acids differed very much in their effects; that vitriolic or sulphuric acid seemed to answer no good purpose; and that even some vegetable acids were more powerful than others. I saw, from experience, that lemons, limes, and some other recent fruits, were very powerful, while common vinegar had little or no effect. I could not avoid making remarks on the great quantities of common vinegar used by scorbutic patients; and the great desire they had for acids. People, labouring under this disease, have been known to use, in the way of drink, and in seasoning their food, one pint of vinegar, each, in the course of a day, with impunity. And I have been informed, from good authority,

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rity,

riety, of a scorbutic patient who drank, in one night, a quart bottleful of good common vinegar, without any painful or disagreeable symptoms being produced.

From the great quantities of vinegar taken, with impunity, by people labouring under the scurvy, I have been led to draw the following conclusions; viz. that the solids, in such cases, from the energy of the brain and nerves being very much impaired, have not that susceptibility which, we may presume, is highly necessary, and which, we are certain, they always possess in the healthy state; and, that, in the fluids, there must be something, opposite to an acid, which takes from the vinegar its pungency, and renders it inoffensive. May not such a state of the system occasion the great desire for acids?

acids? and may not instinct point them out as remedies? My speculations on this subject were very curious; but, at present, speculation is out of the question.

In the course of my enquiry, from a variety of circumstances, I supposed, if common vinegar were charged with dephlogisticated air, now very frequently called oxygen or vital air, it might prove highly beneficial in preventing, or removing the scurvy.

Having seen good effects from nitre, in cases of the scurvy, and knowing it contained a very great quantity of dephlogisticated or vital air, I concluded, that a solution of it in vinegar might answer the end in view. Accordingly, the first favourable opportunity, I subjected it to the

test of truth, experiment ; and, with inexpressible pleasure, I have found it, in a great number of cases, some of them the worst, succeed far beyond my most sanguine expectation.

It is fit that I should now mention the method of preparing, and administering this new remedy.

At first I dissolved two ounces of nitre in one quart of the ship's vinegar, and gave half an ounce of the solution, which I have named acetum nitrosum or nitrous vinegar, to some twice, to others thrice in the day, and as frequently bathed their blotched and ulcerated limbs with the same. From the good effect it had, and from its not producing the smallest degree of nausea, colica, or diarrhœa, I was induced to  
augment



augment the dose to an ounce, and to repeat it as often as before.

Finding by far the greater number of scorbutics, who were under my charge, bore the increased dose of the medicine, without experiencing the least uneasiness, I now, instead of two, dissolved four ounces of nitre in one quart of vinegar, and gave from half an ounce to two ounces of this strong solution twice, thrice, or four times in the day, according to circumstances; and, also, bathed the legs with it frequently in the course of the day, if they were either blotched, stiff, or ulcerated. In this manner I continue to use it.

Some patients cannot bear the nitrous vinegar without the addition of water;  
while

while others, without the least inconvenience, bear it undiluted.

The discharge by stool, the absence or the presence of gripes and nausea, guide me with respect to increasing, or diminishing the dose of the nitrous vinegar; but, at the same time, it is not a slight degree of either nausea, or colica, or diarrhœa, that renders an alteration, in the quantity of the medicine, necessary. To a great number of scorbutic patients, eight ounces of this strong solution, containing one ounce of nitre, have, in the course of the day, as long as such a quantity was necessary, been administered to each with the greatest success. Also, a circumstance no less curious than pleasing, large, and frequently repeated doses of this medicine have been given in cases  
of

of dysenteria scorbutica; and, instead of increasing, I have always found it remove the disease. Sometimes, notwithstanding the free use of the nitrous vinegar, I have known constipation take place to a considerable degree; in which case, I have found intermediate doses of crem. tart. necessary, and highly advantageous. This very constipated state generally occurred where the disease was far advanced. But, in a few particular cases, in delicate habits, and where the disease was not far advanced, I have found even small doses of the nitrous vinegar ruffle the stomach and intestines; to prevent, or remove which, I have found two, three, or four grains of camphor, with each dose of the medicine, very effectual.

In cases of the scurvy, during a course  
of

of the nitrous vinegar, the belly, in general, is kept gently lax, the discharge of urine is increased, and changes from an alkaline to a healthy nature; the skin becomes open, and more agreeable to the touch; the chilliness is changed to a pleasing warmth; and the pulse acquires steadiness and healthy strength. Sleep comes to be more and more natural. The fallow and the gloomy, is gradually changed into a clear and cheerful, countenance. By degrees, the inflammation of the mouth and nose subsides; the gums heal and get firm. The lower extremities lose, faster than could be supposed, their livid hue; they gradually become softer, less painful, and more flexible; and ulcers put on an healthy appearance, and skin over. The great oppression about the breast and stomach gives way; and the cough, and the

the

the breathing become less laborious. The appetite and the sense of taste are restored. The depression of spirits, and the lassitude are not remembered. The strength increases; and, at last, health is re-established.

When the mouth and nose become inflamed, the gums, &c soft, enlarged, ulcerated, and fetid, alum, either allowed to dissolve in the mouth, or, as a wash, dissolved in water, used frequently, was, after trying a variety of things, found to be the best remedy. The restoration of the mouth and nose to a sound state, I must seriously observe, is of the greatest importance; for, as long as they remain spongy, ulcerated, and fetid, the air, passing through them to the lungs, must, it is presumed, be highly contaminated, and,

it is probable, productive of very bad consequences.

With a view of assisting the nitrous vinegar, and more completely fulfilling curative intentions, I have, in general, kept the scorbutics on a mild and nourishing diet, with wine; but on some, in purpose to try the full force of the medicine, little attention has, in that respect, been bestowed. Many scorbutics have, at sea, been restored, by the use of the nitrous vinegar, without any addition to their common allowance of ship provisions. All patients, labouring under the scurvy, have been kept, as much as possible, in good air, it being absolutely necessary.

Barley, pease, or rice, with portable soup boiled with them, in the way of  
broth;

broth; fago, falop, barley, rice, water-gruel, with sugar, or currants, seasoned with cinnamon, or mace; weak infusions of tea, sage, mint, saffrafas, &c. sweetened with sugar; plumb-pudding, and the like, were the articles, in common, for the use of the scorbutics, as well as the sick in general, at sea. White, or red wine, according to circumstances, were allowed, when deemed necessary. If these articles were properly managed, with a plentiful supply of portable soup, the sick, on ship-board, would never be at any loss with respect to diet. I must here observe, as Dr Blane has very particularly done in his valuable publication, that ships companies are more healthy when allowed wine, than when served with ardent spirits. And, on that account, I am sorry, that Dr Blane's plan, of serving wine instead

of rum, &c. has not been generally adopted in our navy.

The Resolution's crew, every morning, at sea, for breakfast, had water-gruel sweetened with essence of malt, which was considered a better method than using the essence in particular cases only. I have long thought, and it is not without due consideration I here remark, that essence of malt, as it is called, is of little utility in the navy. Let me farther observe, that if that article, so very expensive, were laid aside, and, with the great sum which is yearly paid for it, sugar, rice, barley, and a large quantity, in addition to the present allowance, of portable soup taken in its place, many important advantages would, I am convinced, result to the public service. If, by these means, the  
quantity



quantity of portable soup should still be too small, a larger, and sufficient supply ought to be granted. With respect to preserving the health, or curing the diseases of seamen, on ship-board, no labour should be spared; no expence considered too great.

All scorbutics incapable of duty, and in the sick list, ought, in the day time, in fine weather, to be kept, if practicable, on deck, in the open air, walking, sitting, or lying in such postures as to allow the blood, &c. to circulate freely, and to prevent contractions of the lower extremities. The poop, fore-castle, and booms, and not the main and 'tween-decks, are the best places for scorbutics and convalescents taking air and exercise, excepting when the weather is unfavourable, and  
then

then under the half-deck, or as circumstances will allow.

The clothing of seamen ought always to be suitable to the climate they are in. In high latitudes, when the weather is cold and changeable, warm dry clothing is no less powerful in preventing than in curing the scurvy, as well as many disorders to which seamen, from their situation, are peculiarly liable. Indeed, flannel next the skin, in all climates, might be the means of preventing much mischief, particularly to those exposed to hard duty, and to the vicissitude and inclemency of weather, as soldiers and sailors very often are.

From the time I joined his Majesty's ship Resolution, about the beginning of  
October

October 1793, to the middle of July 1795, when, on account of indisposition, I was under the disagreeable necessity of resigning, about one hundred and eighty scorbutics came under my care; and, although a great number of them were extremely bad cases, yet all of them, excepting one man, of a weakly constitution, who died, from the disease violently affecting his lungs, and three others who were sent to hospitals, one to Haslar, and two to Halifax hospital, recovered on board, and chiefly at sea, under many disadvantages, without feeling any inconveniency from the want of lemons, limes, or any kind of recent vegetable matter. The two men sent to Halifax hospital were not so ill as others who were, at the same time, kept on board; but, notwithstanding the uncomfortable situation of the latter, from the

refitting

refitting of the ship, and fresh beef only three times a week, they were restored before the former ; I suppose from the effect of the nitrous vinegar.

In the month of July 1794, at sea, a small quantity of limes were purchased, by order of Admiral Murray, for the use of the scorbutics, at that time on board ; but, instead of depending altogether on their power, I put a certain number only on them, in purpose to compare their effect with that of the nitrous vinegar, which was more generally administered ; and, from what I have seen of both, and after having duly weighed all circumstances, I am, at present, inclined to decide in favour of the latter. From July 1794, neither recent nor preserved fruits were administered

tered to scorbutic patients, on board of the Resolution.

Jeremiah Thomson, and Gottlip Millar, two men belonging to his Majesty's ship the Cleopatra, who were sent on board of the Resolution on the 20th of July 1794, in the Delaware, very far gone in the scurvy, labouring under black, swelled, and stiff, legs, ulcerated and fetid mouths, the teeth being loose (and Millar's jaws locked) with cough and difficulty of breathing, blotched, fallow faces, universal pains, extreme debility, &c. were, as well as many of the Resolution's crew, nearly as ill, completely restored by the nitrous vinegar. Thomson and Millar, notwithstanding their deplorable condition, were healthy, strong, and doing duty, by the time the Resolution got to Halifax, the 16th of August

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following

following, being little more than three weeks from the time they came on board.

In case it should, as it has been already hinted to me, be supposed, that Thomson, Millar, and others, recovered in consequence of refreshments from the shore, I beg leave to observe, that the Resolution, from the 18th of May 1794, the time she sailed from England, until the 16th of August following, the day of her arrival at Halifax, in Nova Scotia, was only two days, from the 20th to the 22d of July, at anchor in the Delaware, and only ten days, from the 27th of July to the 6th of August, at Sandy-hook : at the former, with the utmost difficulty, one day's fresh meat, of a bad quality, was procured ; and at the latter, fresh beef for only six days was obtained. At both places, the ship lay far from, and her crew had no communication

communication with, the shore. A great number of scorbutics were cured before we put into the Delaware; and Thomson, Millar, and others, though fresh meat had been only once served, were, by the 29th of July, in a recovering state.

It may, perhaps, be thought, that prejudice has influenced me, in the account I have given of this new remedy; but, allow me to observe, that I have scrupulously guarded against it, trusting that time will, if I do not here, convince the world of its wonderful efficacy.

Nitre, and common vinegar, of which the acetum nitrosum consists, are articles which may at all times, and with very little expence, be obtained, and without difficulty preserved; and, therefore, ships of war, particularly when ordered to fo-

reign flations, ought to be amply supplied with them. If, at any time, nitre should be wanting, it might be procured by decomposing gun powder, a very simple process. One pound of gun powder will yield nearly five ounces of nitre. This, however, might prove a disagreeable alternative. On board his Majesty's ship Resolution, from May 1794, to the 15th of July 1795, about 108 pounds of nitre, dissolved in about 108 gallons of common vinegar, were administered to about 180 people labouring under scurvy. Not above two gallons of the acetum nitrosum were made at one time.

In ships, I have remarked, that, during, or after gales of wind, or rainy weather, when the 'tween-decks have, for a considerable time, been wet, or damp, the ports  
long



long shut, the hatchways perhaps covered, and the sails frequently wet, the scurvy has, generally, made its appearance; and, according to circumstances, it has become more or less violent. I have likewise found the holders, people berthed in the bays, about the pumps, and in all close, damp places, as well as the lazy and the dirty, who, in hiding places, skulk as much as possibly they can, more subject to this disease than others, differently situated and disposed. But, from all I have observed, I never knew fat people, of an active turn, more liable to it than those of an opposite description. Obesity may be the sign of inactivity, or of indulgence, but not of scurvy. I have, in the course of practice, seen by far a greater number of people of the dark than of the fair complexion afflicted with the scurvy. This disease, I have  
repeatedly

repeatedly observed, is more obstinate in winter than in summer; or in cold than in warm climates; but I have, however, reason to think, that such obstinacy proceeds from ships being clofer in cold than in warm weather, and from the seamen, in the former being neither sufficiently clean, nor sufficiently covered with clean, dry, warm clothes.

A great many instances might be brought forward in confirmation of the scurvy appearing under such circumstances as have been mentioned: only a few, however, will be necessary: The deplorable condition of Lord Anson's crew, in the *Centurion*, in rounding Cape Horn, is a very remarkable one; exposed to tempestuous, rainy weather, the scurvy attacked them, notwithstanding they had, frequently

frequently, plenty of fresh meat on board, and took uncommon pains in sweetening and cleansing the ship. It is here necessary to observe, that, most probably, the sweetening and cleansing mentioned had been nothing else than frequently washing the lower parts of the ship; which, being sufficient of itself to have kept those places damp, would have been improper even in fine weather. Farther, such tempestuous, rainy weather must have forced them to keep the ports and hatchways close, and had prevented them from cleaning and drying the 'tween-decks, &c. as well as have proved the cause of keeping the men much below; hence, we may venture to conclude, the air below, in the hold, and in the 'tween-decks, must have been very foul.

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The slave ship, mentioned by Dr Trotter in his observations on the scurvy, pages 52-3-4-5. second ed. is also a case in point. In page 54, the Doctor, in describing the lower parts of that ship, says, "I, " myself, could never breathe there, unless " under the hatchway." And, again, page 219, the Doctor, in his narration of the eighty Irish convicts, violently ill in this disease, affords another instance, when he says, "Never did I behold together so many " wretched fellow creatures. Those " that were cloathed had not shifted for " for many months ; but the greater part " of them were naked, even without a " shirt; a hammock tied round their shoul- " ders by a rope-yarn was their only " shelter from the cold, and at the same " time without a bed to lie upon. It " ought to be remembered it was now " the

“ the middle of winter, and the weather  
“ for some time before had been wet and  
“ boisterous.” The Doctor does not draw  
any conclusions from such situations, re-  
specting the scurvy, excepting, that they  
predispose to the disease: and page 67, he  
asserts, that “ no predisposition can beget  
“ scurvy without the exciting cause,” a de-  
ficiency of recent vegetable matter.

Many instances of the scurvy attacking  
the crews of ships, under such circumstan-  
ces as have been stated, have come within  
my own observation. I shall relate one.  
In His Majesty's ship Resolution, in the  
year 1795, in the months of January,  
February, and March, when cruising on  
the coast of America, continually exposed  
to cold, tempestuous, wet weather, the in-  
ternal parts of the ship constantly close and  
damp, a great number of the crew were

feized with scurvy, twenty-six of whom were very ill. As fast as some were discharged cured, others complained. In the end of March, from the weather becoming moderate and temperate, and from the ship getting into the Chesapeak, it was natural to suppose that the disease would have been less frequent. However, after remaining twenty-one days, we again sailed, having eleven scorbutics requiring medical attention. During the remainder of April, and the first part of May, although the weather was in general dry and warm (the thermometer seldom below 56, but most frequently from 66 to 76) yet, from fresh breezes and a disturbed sea, the ports being in general shut, as well as from the moisture, occasioned by the winter storms, not being dried up, many of the seamen complained of scurvy. By the middle of May, notwithstanding many had been  
cured

cured from the time we failed, twenty-five were very ill, besides a great number more who were affected in a slighter degree. At this time a scratch, particularly on the leg, soon degenerated into a scorbutic ulcer; and, it was observed, that a great part of the crew had their gums more or less spongy, ulcerated, and fetid, attended with debility and depression of spirits. Nor did these scorbutic symptoms begin to disappear until the following June, that, after a long tract of dry warm weather, the ports frequently open, and long continued ventilation, the moisture, and, along with it, the noxious airs, long pent up, were exhaled.

It has been observed that persons long confined, from chronic diseases, to their rooms, or beds, have had their gums spongy, and more especially if such persons had

not been kept clean, and their rooms properly ventilated.

It is also remarked, that people, after confinement, for a certain time, within doors, although healthy immediately before, lose their natural vivacity, their colour, and their strength. Without a supply of oxygen or vital air, and that in due proportion, the human body cannot, it is presumed, remain long in a healthy state.

Animal bodies, even in a healthy state, no sooner are denied oxygen or vital air than they cease to live; and, in a certain temperature, that is, with a certain quantity of caloric, putrefaction begins. Putrefaction may, it is probable, be begun and continued by means of azote, a very prevailing element in animal bodies, and very favourable to the putrefactive process.



cess. In scurvy, putrefaction absolutely takes place constantly in the gums, and frequently in the legs, as well as other parts, before the unhappy patients are called off the stage.

Animal bodies, in life, like inflammable substances, in combustion, contain within them the extinguishing principle. As combustion, so animal life cannot be preserved without a due supply of oxygen or vital air. As fuel is to combustion, so is food to the human body, in life; both are useless without a due supply of oxygen or vital air.

Vital air in due proportion gives sprightliness and strength to the mind, as well as to the body; by it also, warmth is produced, the ingesta yield nourishment, a proper combination takes place, the blood is  
made,

made, an acid, very probably, is formed, the secretions and excretions are carried on, and life and health are preserved.

A strong resemblance is observed between vegetable and animal life. Vegetables thrive only in good air, in certain temperatures, and in light. In the summer 1791, when pursuing the present subject, I was led to make some experiments on plants; by which I ascertained that they were healthy or diseased, as they were exposed to, or shut up from atmospheric air, and the sun. In dark, close houses, containing foul air, I observed that some plants grew, and lived a short time, but without verdure, appearing altogether unnatural: and when exposed to light and sometimes to the sun, sufficiently supplied with water, but covered with glass jars, and completely shut up from atmospheric air, they ceased to grow; they

they lost their natural colour ; they became white and brown, and very soon decayed.

While engaged in investigating the nature of the Scurvy, I was, partly for amusement, and partly for instruction, led to make the following experiments on blood, and urine ; which, being connected with the present subject, are here presented to the reader. Perhaps, they may prove, in some degree, satisfactory ; or, perhaps, they may induce others, better qualified, to extend the plan.

I. *On Blood taken from a Scorbutic Patient.*

EXPERIMENT I.—From a person labouring under the scurvy, three ounces of blood were taken, into a four-ounce gally-pot, and, after cooling and settling, it was found to consist of two ounces, by weight, of coagulium, and one ounce, by  
measure,

measure, of serum. The coagulum consisted of two parts; that on the top, about a sixteenth of an inch, was of a florid red, and tough; that in the bottom, of a deep red, approaching to black, and easily divided. The serum, with respect to colour, was not uncommon,

EXPERIMENT II.—On a portion of the dark coloured coagulum was poured a quantity of common vinegar; the colour of the coagulum was not altered.

EXPERIMENT III.—On a portion of the dark coloured coagulum was poured a quantity of good lemon juice; and the colour of the coagulum became somewhat lighter.

EXPERIMENT IV.—On a portion of the dark coloured coagulum was poured a  
solution

solution of nitre in common vinegar ; and the colour of the coagulum was immediately changed to a beautiful red, more florid than arterial blood.

EXPERIMENT V.—On a portion of the dark coloured coagulum was poured a solution of nitre in lemon juice ; and the result was the same as in experiment 4th.

EXPERIMENT VI.—On a portion of the dark coloured coagulum was poured some volatile alkali ; and, immediately, the coagulum turned black.

EXPERIMENT VII.—On a portion of the dark coloured coagulum some diluted vitriolic acid was poured ; and, immediately, the coagulum turned black.

EXPERIMENT VIII.—On a portion of

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dark

dark coloured coagulum which had been made black by volatile alkali, a solution of nitre in common vinegar was poured; and the coagulum was changed to a florid red.

EXPERIMENT IX.—On the portion of dark coloured coagulum which the diluted vitriolic acid had made black, a solution of nitre in common vinegar was poured; and the same phenomenon took place as in the preceding experiment.

EXPERIMENT X.—On a portion of dark coloured coagulum made black by volatile alkali, a solution of nitre in lemon juice was poured; and the coagulum was changed to a florid red.

EXPERIMENT XI.—On a portion of dark coloured coagulum which the diluted  
vitriolic

vitriolic acid had made black, a solution of nitre in lemon juice was poured; and the same phenomenon took place as in the preceding experiment.

The above experiments were frequently repeated on blood taken from different scorbutic patients; and with the same, or nearly the same phenomena.

From the few observations I have made on the serum of blood taken from people labouring under scurvy, I cannot, with respect to it, draw any satisfactory conclusions.

## II. *On Urine from a Scorbutic Patient.*

EXPERIMENT XII.—To a vegetable blue infusion was added some of the urine of a person labouring under scurvy; and

the mixture turned green. Mr Robert Fairfowl, of his Majesty's ship Cleopatra, an ingenious surgeon, also made experiments on the urine of scorbutic patients, and observed it changed vegetable blue to green.

III. *On florid blood, supposed to be healthy.*

EXPERIMENT XIII.—On a quantity of florid blood, in a liquid state, was poured volatile alkali; and the mixture instantly turned black.

EXPERIMENT XIV.—On a quantity of florid blood, in a liquid state, was poured diluted vitriolic acid; and the mixture instantly turned black.

EXPERIMENT XV.—On a quantity of florid blood, in a liquid state, was poured  
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ed spirit. nitri d. and the mixture instantly turned black.

IV. *On Urine, from Persons supposed to be healthy.*

EXPERIMENT XVI. — To a vegetable blue infusion was added urine from a person supposed to be healthy ; and the colour of the infusion was no farther altered than being made lighter. More of the same urine was added, until the blue disappeared, and then the mixture seemed to be somewhat higher coloured than the urine was originally.—This experiment on the urine of different people supposed to be healthy, was repeated at different times, and the same, or nearly the same phenomena took place.—The urine of people recovering from scurvy loses the power of changing vegetable blue to green.

From

From all the observations I have made, whether respecting situations in which scurvy is more apt to occur, or symptoms indicating or constituting it, or the effects of medicines in mitigating, or removing it, or from a variety of other circumstances connected with all these, whether by experiment, or by analogical reasoning, I am, in treating of the disease, led to offer a new system, not only with regard to cause and effect, but, also, indications of cure, and remedies.

As, in executing a design, a person, from the respect he bears to the world, and to himself, anxiously endeavours to give satisfaction, so, in the present case, in order to render clear, and, in a satisfactory manner, to establish the principles on which this new system is founded, it is deemed  
necessary

necessary to state the following particulars.

Scurvy is never found but in such situations as have been already mentioned ; or in close, damp places, such as Garrisons, Prisons, &c. frequently are ; and it has been found in such places even when there has not been any want of vegetable diet. All such places, according to circumstances, are filled, more or less, with foul air ; and, according to the present state of our knowledge of chemistry, of late much increased by the combined labour of different philosophers, both at home, and abroad, it is highly probable, that such foul air is chiefly azotic, or hydrogen air. By experiments, these airs are known to be, from their sedative powers, highly noxious, and incapable of supporting animal

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mal life; hence, under certain circumstances, they are, it may be presumed, capable of producing disease. It is also known, that these airs have the property of changing blood from a florid to a dark colour; and, in a combined state, they are, it is believed, of an alkaline nature.

The symptoms of scurvy, depression of spirits, debility, chilliness, nausea, anorexia, constipation, with, at times, a frequent, small, or, at other times, a slow, not preternaturally full, pulse, &c. are evidently, the effects of sedative powers. Likewise, the blood, in this disease, is of a very dark colour; and the urine, from its smell, and from its effect on vegetable blue, is of an highly alkaline nature.

The scurvy, with the assistance of a mild, nourishing diet, has been removed,  
in

in favourable situations, by a sufficient supply of pure atmospheric air, or by medicines containing oxygen or vital air, which are known to be of a cordial, stimulating, renovating nature, and have the property of changing blood from a dark to a florid colour. The urine, likewise, as people emerge from this disease, loses its volatile, disagreeable smell, and its power of changing vegetable blue to green.

Therefore, as scurvy appears in such places as have been mentioned, and as such places are supposed to abound with azotic and hydrogen gasses; as these gasses have sedative powers, and the property of changing blood from a florid to a dark colour, and are, when combined, of an alkaline nature; as sedative effects appear as soon as any in scurvy; as the

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blood

blood is of a dark colour, and the urine of an alkaline nature; as the scurvy is mitigated, or removed by pure atmospheric or oxygenated air, which is of a cordial, renovating quality; as oxygen gas contains, what is diametrically opposite to alkali, the acidifying principle, and has the property of changing blood from a dark to a florid colour; and, finally, as highly oxygenated vegetable acids are more powerful than any thing else in mitigating, or removing all the symptoms which constitute, or attend this disease, I venture to conclude, that

The cause of scurvy is contaminated or poisonous air, most probably rendered so, chiefly, by azotic and hydrogen gasses, of a sedative, contaminating nature, acting more readily in proportion as the body is exposed to, or affected by the operation of other sedative causes, singly, or combined.

1. By

1. By diminishing the energy of the brain and nerves, and, consequently of the heart, vessels, &c.

*a.* Immediately, through the medium of the olfactory nerves, &c.

*b.* Mediatly, from mixing with the blood and fluids secreted from it, through whatever channel.

2. By contaminating or poisoning the blood and the fluids secreted from it; rendering them, it is presumed, from our present knowledge, of an alkaline nature.

*a.* Directly, through the medium of the lungs.

*b.* Indirectly, from the surface of the body, by absorption.

It being impossible for diseased solids to prepare healthy fluids, and equally so for diseased fluids to produce healthy solids,

such effects as the above, the cause being continued, may have a great many phenomena in their train.

From what has been advanced, the indications of cure must obviously be, 1. To restore energy to the brain, &c; and, 2. To restore the blood, and the fluids secreted from it, to their original purity.

1. To restore energy to the brain, &c.
  - A. By pure or wholesome air, the food of life.
    - a. In a natural way, by living in, and inspiring pure atmospheric air, in favourable situations.
    - b. In an artificial way, 1. By oxygen or vital air chemically produced and inspired; or, 2. By such medicines as are known to contain oxygen or vital air; and these may  
be



be used either internally, or externally.

B. By avoiding every thing of a febrile nature, that may render the great and only cause more active; as

- a.* Depressing passions.
- b.* Hard, indigestible food, containing little or no nourishment; and also food containing contaminated or poisonous air, or airs, such as have been mentioned.
- c.* Water impregnated with contaminated or poisonous air, or airs, such as have been noticed.
- d.* The chewing, or the smoking of tobacco.
- e.* The too free use of spirituous liquors.
- f.* Dirty, wet, or insufficient clothing.
- g.* Too

- g.* Too long exposure to cold and moisture, particularly if inactive.
2. To restore the blood, and the fluids secreted from it, to their original purity.
- a.* By all the means under A in the first indication, rendered more effectual by either natural or artificial vegetable acid.
- b.* By the opposites of all the assisting causes, as arranged under B in the first indication.

These indications, with what precedes them, relative to preparing and exhibiting acetum nitrosum, &c. in cases of the scurvy, include all that our present limits will allow concerning remedies.

Particular symptoms, arising from the joint operation of cause and effect, will, no doubt,

doubt, frequently occur, and may require particular remedies ; but, in these respects, the practitioner must be guided by his own judgement. This much I may venture to say, the more nearly the means, for removing such symptoms, correspond with the general indications of cure, the more agreeable and more efficacious will they be.

The nitrous vinegar may be found useful in some species of fever \*, in mortifications, as well as in many other diseases. Other acids may be found equally powerful with vinegar ; the cheapest, all other circumstances the same, will be the best. The time is, probably, fast approaching, when

\* The acetum nitrosum has been given in many cases of typhus with success ; and, in some, even when the medicines commonly used in that disease had failed. In such cases, half an ounce of the medicine has been administered every two hours, for three or four days running.

when proper attention to the exhibition of oxygen or vital air, not only in preventing, but, also, in curing many diseases, will supersede the necessity of violent medicines, such as opium, bark, wine, &c. which, I am afraid, have, of late, been too frequently and too largely administered.

The difference between the new and old method of treating the small pox is now pretty generally ascertained ; and, undoubtedly, it will be allowed, that the cool treatment, as it is called, has been the happy means of saving a great number of lives. But, at the same time, it will, I believe, be found, that the good effects daily experienced from the new method of treating the small-pox do not proceed from the coldness, but from the purity of the air : for the small-pox being a disease that contaminates or poisons the air, more, perhaps, than

than any other, it is evident, that people labouring under it must require a greater supply of good air than they do in common, or under many other diseases. In typhus or putrid fever, I have, I think, observed the most happy consequences result from copiously supplying patients with pure atmospheric air\*.

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\* In typhus, both at home and abroad, I have seen many patients relieved by being exposed to, or copiously supplied with, fresh air. In the year 1790, I visited a man ill of this species of fever. His pulse was frequent and small; and he laboured under comatose delirium. His friends were much alarmed; and had been employed, the whole day, in confining him to a close bed, in an earthen-floored, unventilated room. Finding he wished much to get out of bed, I permitted him. He immediately went to a small window, which I opened, and after remaining at it about a quarter of an hour, he voluntarily returned to bed; after which he continued quiet, slept naturally, and, with a proper supply

If pure atmospheric air is necessary for the support of life, or, for the preservation of health; may it not be equally necessary in curing many diseases? Who does not perceive the difference between a dry and moist atmosphere? Is not a similar difference observable between high and low situations? and, in the latter, do not similar effects take place? Are not the effects I allude to, lassitude and depression of spirits? and, in some low situations, is not the scurvy a disease well known?

There seems to be a cordial and stimulating power in good air, necessary for the  
preservation

ply of atmospheric air, without the assistance of medicine, recovered. I have, I think, known the symptoms of this species of fever alternately aggravated or mitigated, as the patient was shut up from, or exposed to, fresh air.

preservation of health, and for the support of life, exclusive of the effect it may have, after being mixed with the mass of blood. But, foul air seems to possess a contrary power; and azotic and hydrogen gasses destroy life before they can enter, or mix with, the circulating mass.

The illustrious Dr Alexander Monro, lately, in a course of no less ingenious than well directed experiments, on the nervous system, renders M Fontana's opinion respecting the effect of poisons on the blood inadmissible; and concludes, "that opium  
" and other poisons, even after they are  
" mixed with the mass of blood, produce  
" their fatal effects, chiefly and almost solely,  
" ly, by acting on the nerves of the heart  
" and vascular system, and, through these,  
" affecting the whole of the nervous system."

All these circumstances I have mentioned, and wish them to be observed, because they are connected with what has been advanced respecting azotic, hydrogen, impure or poisonous air, of a sedative nature, inducing scurvy, by affecting the solids and fluids; and also, because they, in some measure, point out the great necessity of keeping ships, at all times teeming with polluted effluvia, constantly supplied with salutary air, by uninterrupted ventilation, by such means as contribute to cleanliness and to dryness, and by such measures as are calculated to prevent, remove, or correct moisture.

In ships, the quantity of air contaminated must be great. By way of calculation; supposing the complement of a seventy four gun ship 600 men, 580 of whom sleep in the 'tween-decks and cockpit;



pit; and supposing each man consumes one gallon of atmospheric air every minute, the whole must, at that rate, destroy 580 gallons; or 34800 gallons every hour; and, if we suppose the foul air issuing from the hold, cockpit, and all close or unventilated places, including the combustion of candles, to pollute as much as the people do, it comes out, that, in eight hours, the time we shall allow the crew to be below, in the night time, while in harbour, 556800 gallons of atmospheric air will be consumed; or, that quantity will be required to supply five hundred and eighty men, eight hours in such a situation. This calculation is not given as accurate; it is, however, no farther erroneous, than being a great deal below the truth.

For a more constant ventilation, and  
supply

supply of atmospheric air in ships, tubes, I think, might be so contrived as to pass from above the gunwalls, inwardly, by the timbers, or by the sides of ships, with their funnel-mouths turned to windward, through which atmospheric air would pass into different parts; and the rarified, contaminated air would pass up through the hatchways, or through tubes resembling the others, but inverted, with their funnel-mouths, or lower ends (funnel-form not being absolutely necessary) nearly close to the decks, and their upper ends, with an angle of 90 degrees, turned to leeward. If these two sets of tubes were placed accurately, and at a proper distance from each other, their effect would, it is probable, be very considerable. The top-parts of the tubes ought to be made to go round, in purpose to be turned to windward, or to leeward, as occasion might require.

quire. Any number of tubes, such as have been described, might pass to and from different parts of ships.

The common ventilators or air pumps, on board of ships of war, are calculated for pumping up foul air from the hold, store rooms, &c. and, were they kept constantly acting, might, with the assistance of wind sails, down the different hatchways, be of considerable service. They cannot, it must be granted, be made so extensively useful as necessity requires; but at the same time, they ought to be constantly used, until a better mode be adopted. An hose, air-tight, fastened to the upper part of the barrel of each of these common air-pumps, and to pass to leeward, out of a gun-port, or gun-port scuttle, would be no small improvement, as by these means,

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the foul air would, at once, be carried without board.

With respect to the means of preserving dryness, or preventing, removing, or correcting moisture, it must be observed, that open fires of charcoal, wood, or any combustible substance, particularly if there be but little ventilation, are unfavourable; for by them, in such a way, the air of an apartment, instead of being rendered more pure, will be farther corrupted. All substances in a state of combustion must absorb good, and according to their several qualities, emit foul air.

A great number of officers, sensible of the very bad effects resulting from moisture, in ships, most cautiously guard against it by every means in their power. But, still, many ships are rendered damp,  
and

and unwholesome, by too frequent washing. The 'tween decks, and even the main decks of ships, ought not, more especially in the winter time, to be often washed. The internal parts of ships might, in general, be kept clean, dry, and wholesome, by sweeping, scrubbing, and scraping, and by proper ventilation, without water being very frequently applied. What can be more unnecessary, irrational, and unwholesome, than washing every morning, in whatever kind of weather, the decks, &c. of ships?—Some officers, also, not contented with every day pouring water on the decks, &c. wash, and, as they say, sweeten the hold, by letting salt water into it, and, after a certain time, pumping it out: with such an idea, I have known an hand pump kept almost constantly going. As moisture, in close places where people are crowded, contributes largely to induce the scurvy,

as well as other diseases, it is to be wished that the internal parts of ships were always kept clean, without having so frequently recourse to water as hitherto has been the custom.

Be it remembered! Captain Cook was particularly careful in keeping his ships clean, dry, and ventilated, as well as his men clean, dry, properly clothed, and temperate; and he reaped the fruits of his labour; his crews were healthy. That great circumnavigator's ships, it is true, were not loaded with people as men of war are; but, what is no less true, that circumstance clearly points out the great necessity of being the more particular in having the latter kept, both with respect to ships and men, as were the former.

APPENDIX;

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APPENDIX;

BEING

COPIES OF FIVE LETTERS,

Respecting the Effect of ACETUM NITRO-  
SUM, in the cure of Scurvy.

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A P P E N D I X.

I.

*A copy of a letter from Mr R. H. Beaumont,  
now Surgeon of his Majesty's ship La Pre-  
voyante.*

SIR,

Having had for some time past, an opportunity of observing your practice, I could not but with admiration view the success you met with in the cure of scurvy, by the use of the nitrous vinegar. Permit me to congratulate you, and at the same time, return my most sincere thanks for your information on that disease.

I have witnessed many cases where the  
disease

disease was far advanced (and those at sea) perfectly cured; and that happy change appeared to be brought about by the nitrous vinegar, as soon as by the use of recent vegetable matter. Such success, in eradicating a disease which has hitherto proved so destructive to our navy and army, will, I hope, induce you to make your experiments more generally known. Should it be necessary, I would with the greatest pleasure attest many individual facts.

I am, Sir, Your, &c.

(Signed) R. H. BEAUMONT.

*October 26th, 1794.*

*To Mr D Paterson, Surgeon, }  
H. M. S. Resolution. }*

## II.

*A copy of a letter from Mr Robert Fairfowl, Surgeon of his Majesty's sloop Lynx.*

SIR,

Having understood from Captain Berresford that you used, and recommend for the scurvy a preparation of a particular kind, and, from his description, conceiving it to be an aceto-nitrite of potash, I made up something similar to it, and gave it in one case, I think, with success.

You would much oblige me by giving me an account of your manner of preparing and exhibiting the medicine.

I am, Sir, Your, &c.

(Signed) ROBERT FAIRFOWL.

*Lynx, May 23d, 1795.*

*To Mr D. Paterfon, Surgeon, }  
H. M. S. Resolution. }*

III.

## III.

*The following is a copy of a letter to Mr Robert Fairford, in answer to his of the 23d May, 1795; directions for preparing the nitrous vinegar, and for exhibiting it in cases of fever, having been previously given to Captain Charles Rowley, at that time Commander of his Majesty's ship Lynx.*

SIR,

In addition to the memorandum which I gave to Captain Rowley, I beg leave to observe, that the discharge *per anum*, the absence, or presence of spasm of the abdominal viscera, and nausea, guide me with respect to increasing or diminishing the dose of the medicine which I have recommended, and which I have thought proper to name, in a plain way, acetum nitrosum. But, at the same time, it is not a slight degree of either nausea, colica, or diarrhoea, that

that

that render an alteration, in the quantity of the medicine, necessary.

Some patients cannot bear the acet. nitros. without the addition of water; while others, without the smallest inconveniency, can bear it undiluted.

In general, the acet. nitros. keeps the belly sufficiently open, at the rate of two, or three stools a-day; but, at times, constipation is to such a degree, that I have found intermediate doses of crem. tart. necessary, and highly advantageous.

If the mouth and nose should become inflamed, the gums, &c. soft, enlarged, ulcerated, and fetid, alum, either allowed to dissolve in the mouth, or, as a wash, dissolved in water, used frequently, is, I find, after trying a variety of things, the best

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remedy.

remedy. Twice or thrice a-day, the mouth, in particular cafes, may be washed with the acet. nitros. using the alum as a general application. Indeed I frequently bathe the whole body with the acet. nitrosum. At all times I am particularly careful in keeping the skin of scorbutics clean.

With a view of more completely fulfilling curative intentions, it is prudent to keep scorbutics on a mild, nourishing diet, with such a quantity of wine as circumstances point out.

To remove, as well as to prevent scurvy, and to co-operate with medicines administered, pure air, that is atmospheric air with a due proportion of oxygen, is absolutely necessary. It is, probably, from the acetum nitrosum being an highly oxygenated medicine that it is so wonderfully beneficial

ficial in removing the scurvy: so much so, that I have good reason to call it a specific.

Our scorbutics are, in fine weather, kept on the poop, fore-castle, or booms, almost the whole day long; and in the night time, they sleep in as airy situations as possible: in bad weather under the half-deck is the most eligible place for them. Those very ill, and in the sick list, ought to walk, sit, and lie by turns. The lower extremities ought always to be in a state of extension; and nothing done, to prevent, in them, a free circulation of the blood, &c.

Great attention should be paid to render scorbutic people happy; at the same time, taking care not to indulge them in any thing hurtful: in the summer time, or in warm climates, they ought not to be above seven, or eight hours in bed, in the four

and twenty: they ought to be kept at their duty as long as possible. Flannel, next the skin, and frequently shifted, contributes considerably to forward the cure of the scurvy.

A dry, clean ship is necessary, not only in curing, but, also, in preventing the scurvy. The 'tween-decks of ships, more especially single-decked ships, ought to be but seldom washed: they ought to be swept very frequently, and scraped once every day, excepting on the days they are washed.

A free and constant circulation of air throughout the ship is, at all times, salutary. The holds of ships ought to be kept always as dry, and as clean, as the nature of circumstances will admit of, and constantly ventilated. I don't approve of the  
method



method some have of letting in salt water into the holds of ships, and pumping it out again, in purpose, as they say, to keep their ships sweet. Such a method, I presume, answers very well the purpose of rendering a ship a very disagreeable marsh, constantly producing, and teeming with contaminated air, of an highly sedative nature, inducing scurvy, and, in various ways, destructive to the health and lives of seamen.

A water pump while acting, may be considered as a kind of ventilator: it must be observed, however, that the moisture produced, by letting in the salt water, more than counteracts the temporary and limited effects of such ventilation.

Farther, neither salt nor fresh water ought to be started out of casks into the holds of ships; for, in that case, as water, especially

especially salt water, when confined, becomes soon fetid, not only the hold and every part of a ship is filled with foul air, but, also, a moisture is produced, which is not so very easily corrected.

Seamen ought not to be allowed to sleep, nor to lie, on deck in the night time, more especially in high latitudes, in cold, damp weather, or, in fine weather, if the decks are wet; such acting is an assisting cause in the scurvy, as well as a primary cause of many other diseases. Pressure, continued for only a very short time, particularly on the lower extremities of scorbutic people, will occasion ecchymosis. Scorbutics ought always to be kept in a proper temperature, and that, by studying their own feelings.

These observations, respecting the exhibition of the acetum nitrosum, &c. are  
what

what occur to me at present. I have, in purpose to enable you to administer the medicine with the greater success, and not by way of dictating to you, pursued the subject farther than otherwise I should have done.

I might add much more relative to the cure and prevention of the scurvy were I not, in the first place, sensible of you being able to think and judge for your self; and, in the second place, afraid of appearing presumptuous, by being tedious on a disease with which, through the friendly medium of Dr Trotter, you have had ample opportunity of becoming acquainted. My intention, from the first, was merely to give you a few hints relative to a medicine which I have found more powerful than any other in removing scurvy, and with which I acquaint you,

at

at your own, as well as Captain Rowley's, request.

When you ask my opinion, I shall be happy in giving it to you, with candour ; and, in expectation that you will observe the same rule ; and, consequently, trusting that you will inform me of the effects you experience from the *Acetum Nitrosum*,

I remain, Sir, respectfully, your &c.

DAVID PATERSON.

*H. M. S. Resolution, at Sea,* }  
*25th May, 1795*

To Mr Robert Fairfowl, surgeon,  
 H. M. Sloop Lynx.

## IV.

*A copy of a letter from Mr Robert Fairfowl, respecting the effect of Nitrous Vinegar, in ten cases of Scurvy, on board His Majesty's Sloop Lynx.*

SIR,

When I received yours of the 25th of May, containing an account of the acetum nitrosum, in the Lynx there were ten men affected with scurvy, all of whom were at that time unfit for duty. The common symptoms of that disease, I mean weakness, fatigue from the slightest motion, pains over all their bodies, particularly about their breasts, loose spongy gums, with tightness of the hams, were nearly the same in all. Five of the ten complained of these symptoms without any other local disease, two had painful swell-

L

ings

ings in their knees; and it may be observed, that the patellæ, on being moved, produced a crackling noise; other two had blotches over most parts of their bodies; and one man had both legs ulcerated. Most of them had been seized about the middle of April, between which time, and the 25th of May, they had been treated in the usual manner at sea; that is, they had of essence of malt as much as they could use; and the acid. vitriol. ten. was also exhibited; they were forbid the use of salted provisions, and had fresh meat very frequently from Captain Rowley. But under these favourable circumstances, instead of diminishing, some of their complaints were evidently gaining ground.

Such was the situation of these men, when they began the use of the acetum nitrosum;

trofum; of which they took about an ounce and an half three times a day.

The consequence was, that on the fifth of June following \*, the two men affected in the knees returned to their duty; and when the ship came into harbour, which was on the 12th of June, there were only five scorbutics in the sick list, two of whom were immediately sent to the hospital, and another, although he had recovered, was sent soon after, for particular reasons. One of the blotched cases has since recovered, and the man with the ulcerated legs is nearly well.

This is all the experience which I have had of the acetum nitrosum; and I think that

\* Only ten days from the time they were put on the medicine.

that the recovery of seven cases † out of the ten may be safely attributed to its good effects.

I am, Sir, Your &c.

(Signed) ROBERT FAIRFOWL.

*Lynn, Halifax harbour, }  
30th June 1795. }*

*To Mr D. Paterfon, Surgeon, }  
H. M. S. Resolution. }*

V. A

† Seven cases' out of the ten must be a mistake; two men only having been sent to the hospital on account of the scurvy, eight out of the ten must have recovered from that disease on board.



## V.

*A copy of a letter from Mr Joseph Fleming,  
Surgeon of his Majesty's ship the Cleopatra,  
respecting the effect of nitrous vinegar  
in scurvy.*

DEAR SIR,

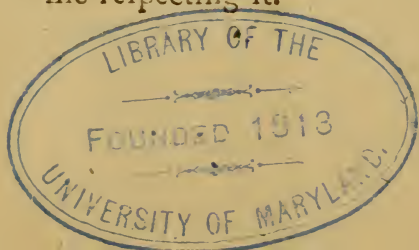
I received your letter, dated the 31st of last January, in Lyn-Haven bay, mentioning the success of acetum nitrosum in scurvy, since which time, I have had an opportunity of trying it, in one case, with very good effect.

George Stephens, aged 21 years, complained, on the 16th of April, of a number of small brown specks on his legs and arms; his complexion was fallow, gums flaccid, breath fetid, and there were livid spots on his thighs and legs, with rigidity  
of

of the hams, and dyspnœa; he returned to duty on the 27th of May following.

Gottlip Millar, aged 32 years (the same man you had under your care last July when we were ordered on a cruise to the southward) complained on the 6th of June: Symptoms the same as in the preceding case, dyspnœa excepted, which enabled him to keep the deck; but, on the ship being hauled a long-side of the wharf, to refit, he became so dejected, and anxious to get on shore, I sent him to the hospital on the 23d instant.

I conformed strictly to your mode of administering the medicine; and whenever any case occurs requiring the use of acetum nitrosum you may depend on hearing from me respecting it.



I hope we shall be able to continue treating with success a disease so baneful to seamen.

I am, Dear Sir, with great regard  
and esteem,

Your, &c.

(Signed) Jos. FLEMING.

*Cleopatra, Halifax, }  
28th June, 1795. }*

*To Mr David Paterfon, }  
Resolution. }*

The above two cases occurred, and were treated, at  
sea.

F I N I S.



















