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A N
E S S A Y
ON THE
MOST EFFECTUAL MEANS
Of preserving the
HEALTH of SEAMEN,
In the ROYAL NAVY.

CONTAINING
DIRECTIONS proper for all those who undertake
long Voyages at Sea, or reside in unhealthy
Situations.

WITH
CAUTIONS necessary for the Preservation of such
Persons as attend the Sick in Fevers.

By JAMES LIND, M. D.

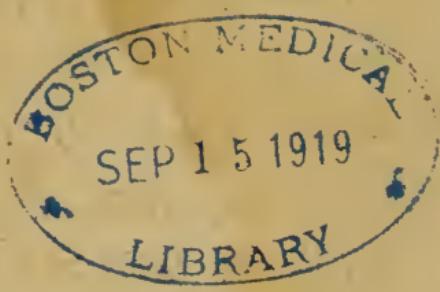
Physician to the King's Hospital at Haslar, near Portsmouth;
And Fellow of the Royal College of Physicians in Edinburgh.

The SECOND EDITION, Improved and Enlarged.

Principiis Obſta.

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To the Right Honourable

GEORGE LORD EDGCUMBE,

My LORD,

I Beg Leave to prefix your Lordship's Name, as the most proper Introduction to this *ESSAY*, by exhibiting a Pattern of that humane Disposition, which is requisite to put in Practice the Rules contained in the following Pages.—A Disposition not less honourable to your Lordship, than beneficial to the Public; and which, added to many other amiable Qualities, rendered you esteemed by your Officers, beloved by your Men, and
respected

respected by all, who felt the happy Influence of your Command.

That, in the Royal Navy, so laudable an Example may become the Object of universal Imitation, is the sincere Wish of,

MY LORD,

Your Lordship's most obedient,

and most humble Servant,

JAMES LIND.

T H E

T H E
P R E F A C E.
TO THE
F I R S T E D I T I O N.

IN Times of public Tranquillity, when only smaller Ships of War are employed, and manned with sound and seasoned Sailors, their Cruises or Voyages short, and sufficient Opportunity allowed to refresh in Harbour, the Seamen in his Majesty's Service are in general, healthy.

—A

— A ship of fifty or sixty Guns, commonly buries fewer Men in three Years, than most Villages in *England*, containing a like Number of Inhabitants, except in a few accidental Cases; as when a Ship upon the Coast of *Guinea*, or the *West-Indies*, suffers by any extraordinary Efforts of Sickness, derived from Causes hereafter specified.

But Circumstances widely differ in the turbulent State of War, or when any Emergency requires the immediate Equipment of a large Fleet, and renders the impressing of Men absolutely necessary. Then it is, that Sailors, returning with exhausted Constitutions, from long and sickly Voyages in the Merchants Service, and Persons unaccustomed to a marine Life, as well as many naked and diseased Objects dragged from the Streets and swept from the Prisons, are promiscuously sent on board.—Hence various Causes of Sicknes in a Ship: of which, the Infection received

received from Men lately diseased, or from the tainted Rags of Jails, is none of the least.

Too close Confinement in the damp and foul Air of large Ships, Discontent, and the requisite Duty of the Service, may also create Diseases : and the Intercourse of different Ships serves often to propagate them by Contagion ; especially when the Removal of the Sick on shore is inconvenient, on account of the Danger of their Desertion. —— Thus it is, that many Distempers which, in a well-aired City or Village, would affect only a few Individuals, may, in such Patients, and from their peculiar Situation in a Ship, acquire a high Degree of Virulence, and put on a contagious Disposition.

All acknowledge the Train of Diseases, to which, from the Mechanism of our Body, we are necessarily subject. And it is as manifest, that many more are produced,

duced, by supervening external Causes. Thus a quick Transition to a new Way of Life, sudden Changes of Climates, the various Inconveniences and Hardships peculiar to Mariners, plainly account for many of their Diseases. Nor is it to be doubted, but that proper Methods and Precautions might be taken to prepare and insure the Body to bear such sensible Alterations, as are apt to affect the Constitution; and that by removing, or guarding against, other Causes of Sickness, to which Sailors are exposed, the Health and Lives of many of them, who are extremely negligent in this Point, might be happily preserved.

It may be worth observing, that the *prophylactic* or preventive Branch of medical Science does, in many Instances, admit of as much, or even more Certainty, than the curative Part. For it would be easy to demonstrate, that the Rules for the Preservation of Health and Life, in many singular and dangerous Situations, are founded
on

on clear and self-evident Principles. They are often the natural Dictates of Sense and Appetite, approved by Reason, and established by Observation. The Advantages also resulting from such like salutary Precepts, are superior to any other; as the nauseous Dose is here avoided or abridged, and as a Medicine, which effectually prevents, deserves to be more esteemed than that which removes a Fever.—Diseases, precarious in their Event, though at last cured, impair the Constitution, render it liable to Relapses, or other subsequent Attacks; and, the Patient is necessarily afflicted, for a Time, with Infirmity and *Languor*.

With Regard to the Royal Navy, when the Men are preserved in Health, by proper Management; Courage and Activity are the certain Consequences.

To a Crew replete in Health, what Enterprize too dangerous? What Achievement too great? Whereas a sickly Shp's

Company, impotent and dispirited, have frustrated many a well-concerted Expedition, and that Bravery, which the Enemies of our Country have not been able to vanquish, has fallen a Sacrifice to the cruel Ravage of devouring Disease.

An additional Motive to excite the public Attention to this important Subject, (the Preservation of the Health of our Seamen) is the considerable Savings, which will thereby be made, in immense Sums expended by the Government, in the Article of Hospitals, and the various Necessaries, which are there so amply provided for them.

If then it shall appear probable, that by observing a few easy and practicable Rules here delivered, the Health and Lives of many of our Sailors may be preserved, I flatter myself, that this *Essay* will meet with a favourable Reception. And it is a great Pleasure to me, upon this Occasion, to address

address the Commanders of his Majesty's Ships of War; as I know many of them, who are no less distinguished by their Valour, than by their compassionate Care of their Men.

It gives me no small Satisfaction to observe, that since the ensuing Sheets were sent to the Press, the Government has purposed to introduce in the Royal Navy, an Allowance of portable Soup; a Regulation, on which the Service may be truly congratulated; nor is it less laudable than advantageous to the Public, and deserving from our Seamen the warmest Gratitude.

Common Humanity, indeed, ever pleads for the Afflicted, and calls for the Assistance of all, whose Abilities or Observations are capable of rescuing Mankind from Pain, and the many direful Attendants of Disease. But, surely, there are no Lives more valuable to the State, or have a better Claim to its Care,

Care, than those of the *British* Sailors, to whom this Nation, in great measure, owes its Riches, Protection, and Liberties.

What is here proposed, is chiefly founded upon Experience, and the Result of an Attention to the Diseases more peculiarly incident to the Royal Navy.

In an Affair so highly interesting, as the Lives of many of my Fellow Subjects, I shall often take Notice of Circumstances, which may be deemed too minute. But be it not forgot, that upon a due Observance of many such Circumstances, Matters of Consequence will depend. Preservatives from Sickness ought, as little as possible, to consist in Medicines, but rather in such general Precepts, as all may easily obey. A few present seeming Inconveniences attending the Rules recommended, may be abundantly

dantly compensated by future Benefits. And I make no doubt, but Time and Use will reconcile the Men to some Things in these Sheets, if approved, which bear the Face of Novelty.

Nothing, I am afraid, has contributed more to the great Sickness of late in our Fleet, than too strict an Attachment to old Regulations and Customs. Some new Regulations are plainly wanted. But as there is no universal Medicine to be found in Nature for all Diseases, so neither is there any one particular Method, much less any single Medicine, which can afford an effectual and universal Protection against the various Maladies of Seamen.

The Means, here to be proposed, for the preserving the Health of a Ship's Company, are two-fold: and consist;

First

First, in the Methods proper to prevent the Generation of Sicknes in a Ship.

Secondly, in certain Precautions to stop the Spreading of contagious Diseases, when bred.

T H E

A D V E R T I S E M E N T
 TO THE
 S E C O N D E D I T I O N.

THIS book was first published, soon after the commencement of the present war with France, as a plan of directions for preserving the British seamen from such distempers as prove much more fatal to their *corps*, than all the other calamities incident to them at sea. For the number of seamen in time of war, who die by shipwreck, capture, famine, fire or sword, are indeed but inconsiderable, in respect of such as are *destroyed* by the ship diseases, and by the usual maladies of intemperate climates.

The Abbé Mascas has translated this Essay into French, and it appears there was an order given by the French king that it should be distributed to both the Indies, and to all the maritime parts of his dominions.

Dr. Wind, an eminent physician in Middleburgh, has translated it into Dutch, with the addition of some judicious notes.

My public acknowledgments are also due to Dr. Moncky, physician at Amsterdam, for the honourable mention he has made of my name in his treatise, which obtained the Dutch premium as the best answer to the question proposed by the Society of sciences in Holland, relative to the diseases of seamen in voyages to the West Indies.

I have now revised these sheets, and made some additions, endeavouring to render this performance more extensively useful, not only to all seamen and passengers in ships, but also to others, more especially to many of our colonies, and factories abroad. In the second part, I have more fully enlarged on the precepts for securing such as attend sick persons against infection, which are not confined to seamen or to ships, but intended as general directions, and as a supplement to my two papers, now published, on fevers and infection.

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ADDEN.

A D D E N D A.

Page 42, line 15, after *immerfed*, read, *up to the chin*.

Page ibid. line 26, after *the veins &c.* read, *and dash-ing a large bucketful, or two, of cold water on his face, naked stomach, or thighs; by the shock of which many have instantly recovered from the danger of being suffocated by the vapour from the ship's well, and other noxious damps.*

Page 90, line 26, after *clean vessels or casks*, read, *If all vessels, commonly used at sea for boiling on the fire, were furnished with such a head, the double advantage not only of saving much fuel, but a great quantity of water, would be reaped. Thus, if the barley-water, gruels &c. for the sick, which are made with fresh water, be boiled in this manner, all the water which would otherwise be expended by boiling away, would then be saved; and nothing further is required than that the pots or saucepans be somewhat larger than at present used, because they ought then never to be filled above one half or three quarters full, and the cover must not be so tight, but that the cook may easily remove it at all times, either to inspect into the condition of what is cooking, or to stir about such materials in the pot, as are apt to rise up, or boil over, which I find oatmeal to be the only article of ships provisions that does. The cook will soon learn what small quantity of fuel is necessary to keep such pots boiling, and the trouble of a more constant attendance to prevent the boiling over, will be fully rewarded, by saving two of the most important articles at sea, fuel and water.*

As the evaporation from water is as the squares of its surface, hence so much the wider the iron pots are made, which were before recommended for the sides of the grates, the more fresh water will be obtained.

A N
E S S A Y
ON THE

Most effectual Means of preserving
the Health of Seamen in the
Royal Navy.

S E C T. I.

Of preventing the Breeding of Sickness.

IN the Equipment of a Fleet there are two Sorts of Men from whom Sickness may be apprehended, *viz.* Sailors imprest after a long Voyage from the *East* or *West-Indies*, or the Coast of *Guinea*; and such idle Fellows as are picked from the Streets or the Prisons.

The former are often deeply tainted with scorbatic and other Disorders, which usually break out upon a longer Confinement and Fatigue at Sea. The Constitution might, in this Case, by proper Care, be surprisingly soon restored, and the Men duly prepared for another Voyage.

From the latter Set of Men, there is Danger of communicating Infection to the whole Fleet. That there is a Disease of a contagious Nature, the Produce of Filth, Rags, Poverty, and a polluted Air, which subsists always in a greater or less Degree in crowded Prisons, and in all nasty, low, damp, unventilated Habitations loaded with putrid animal Steams, is now well known, and has been too often fatally experienced, by taking such contaminated Persons into our Ships.

With Deference then to better qualified Judges, I would beg Leave to suggest, that the proper Method to be taken to secure the future Health of the imprest Sailors, and to obviate the Mischiefs which might accrue from diseased Landmen, seems to be this.

In the usual Descriptions of imprest Men taken by the regulating Captains, it would be proper to insert their former Way of Life,

the

the Place of their late Residence, their present State of Health ; and, with regard to Sailors, the Length and Healthfulness of their last Voyage. If, in Consequence of this Report, those who are just arrived from a long and sickly Voyage, were directly allowed fresh Provisions, and especially a sufficient Quantity of Greens, in *lieu* of salted and other Meats, a Diet of this Sort continued for at least three Weeks, would, in all Probability, sufficiently cleanse and restore their Constitution, and fit them for immediate Service.

A different Method may be necessary to be taken with imprest Landmen. A Guard-ship is usually stationed at the *Nore*, to receive those who are taken up in *London*. But Experience has shewn how fatal she has often proved to the Health and Lives of many Seamen ; and that this Ship has become a Seminary of Contagion to the whole Fleet. One diseased Person from the Street, or Cloaths from a Prison, have often conveyed Infection on board, which it has been extremely difficult afterwards to get quit of. For the confined and corrupted Air in a large crowded Ship, greatly favours the spreading of this Contagion, and the Exertion of its utmost Malignity. From this Source, the Environs of *Portsmouth* and *Plymouth* have

more than once been annoyed with an almost pestilential Contagion, which certain Regulations might, in all Probability, have effectually prevented *.

To

* This has hitherto been the most fatal and general Cause of Sickness in the Royal Navy, especially on the first fitting out of the Ships. In the Commencement of the present War, the Seeds of Infection were carried from the Guard-ships into our Squadrons, to all Quarters of the World, and particularly to *North America*, by the large Fleets which sailed thither: And the Mortality, thence occasioned, was greater than by all other Diseases or Means of Death put together.

After the receiving Guard-ships were repeatedly purified, by the most proper Orders and Methods for that Purpose, fresh Draughts of imprest Men still continued the Infection, in Opposition to all the Care taken by the Officers, and their utmost Vigilance and Attention to keep these Ships sweet, well-aired, and clean: Nor could it be otherwise; for the purest Air cannot cleanse Rags from Contagion. I have known a thousand Men confined together in one Guard-ship, some hundreds of whom had neither a Bed, nor so much as a Change of Linen; I have seen many of these brought into *Hastlar* Hospital, in the same Cloaths and Shirts they had on, when pressed several Months before. In this Case, it was impossible to prevent the Generation or Progress of Disease. The fatal Mischief lurked in their tainted Apparel, and Rags; and by these was conveyed into other Ships. A late Instance is sufficiently known, where the polluted Cloaths of Prisoners, brought from *Newgate*, and other unclean Places, have infected and destroyed the Judges

on

To prevent the Communication of the Infection, a Tender might be appointed in the River, to receive such Men only as the Regulating-Captains should direct. There, the most ragged and suspicious Persons, whether prest at Sea, or on Shore, should remain for at least

on the Bench, and others, in an open Court : And still greater Danger may be apprehended from such Materials in a Ship.

If the Captains of those Guard-ships had ordered a Supply of Bedding, and such Seamen's Cloaths as are commonly called *Slops*, to all such imprest and transferred Men as were in want of them ; it is said, they would have encumbered their Ship-books so much with *Slop* Articles, as to have rendered it difficult for them to have passed their Accounts. This I believe to be the candid Matter of Fact. The Means of obviating these Difficulties, and of averting in future Equipments, during a warm Press, the Danger that is to be apprehended, I must leave to better Judges, and my Superiors : Mean while, with due Submission, I shall suggest the following Expedient. If the Seamen in his Majesty's Service were put into an uniform Sea-Habit, with some little moveable Badges, or Variations (if judged necessary) by which it might be known to what Ship they belong : each Man would at first go clean and neatly cloathed on board his Majesty's Ships ; and by the proper Care of the Officers, in frequently inspecting their Apparel, be kept so constantly : And all the Inconveniences of serving *Slops*, and the Abuse of some Seamen in selling and destroying them, might, perhaps, be effectually prevented.

fourteen Days, where their old Cloaths might be destroyed, and new ones given them ; and their Persons being well purified and cleansed, they would thus be prevented from carrying Rags, Filth, and Infection on board the King's Ships.

The Precaution of destroying the Cloaths of all such who are brought from *Newgate*, or other suspected Places, ought not to be neglected ; because, although fourteen Days may be a sufficient Time to discover whether a Person is free from the Taint, yet we cannot precisely determine what Time may be necessary to purge their Apparel from this Contagion. Woollen Cloaths, in particular, are disposed to retain it a considerable Time.

It may be proper further to observe, that when a Tender arrives, with imprest Men, at the *Nore*, from any Part of *Great-Britain* or *Ireland*, who, having been long confined, under close-shut Hatchways *, during bad Weather, or in Summer Time, may be supposed to have suffered by the polluted Air †, in such a

* The Openings or Doors by which they descend from one Deck or Floor of a Ship to another.

† This may be known by several complaining of Shiverings, Pains of the Breast, with Cough, too often mistaken for Fits of an Ague, or common Colds, and others of a Head-ach, accompanied with a low Fever.

Case, the Sick ought to be sent into a Lazaretto, Hospital, or well-aired Place on Shore ; and the rest of the Men refreshed by good Air, but especially to have their Persons well purified, and supplied with clean Slops. If it should happen that this Vessel is truly infected, she ought to be purified in the Manner proposed in the second Section of this Essay.

In Time of War, the Guard-ships become often excessively crowded with prest, transferred Men, &c. which the Exigency of the Service requires. At this Season, the Officers must be particularly careful in the Article of Cleanliness in the Ship. For this Purpose, the Cloaths of the Men ought frequently to be inspected, to prevent their felling of them ; and thereby reducing themselves to all the Inconveniences attending the Want of a sufficient Quantity of clean Apparel : Nakedness, Sloth, and Filth greatly contributing to the Production of Diseases. The Men and Hammocks* ought every Morning, in fair Weather, to be sent upon Deck, when the Gun-ports should be opened, and the lower Decks well scraped and washed ; mean while such a Number of Hammocks should be fcrubbed and cleaned, that every Hammock in the Ship may have undergone this Oper-

* The hanging Beds of Seamen.

ration at least once a Month. In bad or moist Weather, the lower Decks must only be scraped and swept. When the Weather will permit, Fires of dried Wood must be used between Decks, lighted in Iron Kettles, or large Tubs, filled partly with Shot and Sand. The burning Wood may be occasionally sprinkled with some Resin, or Bits of Rope, dipt in Pitch and Tar. These Fires must be carried into all the different Parts of the Ship, that Safety will permit ; I mean, the *Berths* * of the Men. During the Continuance of rainy, moist Weather, the Ship ought, twice a Day, to be fumigated with the Steam of Pitch or Tar, raised by a hot Iron ; and, upon the Return of good Weather, be thoroughly cleansed, as above directed, with the Addition of having the Beams, &c. where the Men lay, washed with warm Vinegar. Nor must this important Direction be omitted, that the Air, both by Night and Day, be renewed by the incessant working of the *Ventilators*. — By such Methods duly practised, not only Guard-ships, crowded with Men, but all other Ships, will probably continue healthy.

* A Term used at Sea for the Place where the Men eat and sleep.

As raw Sailors, and unseasoned Marines, are often the Occasion of great Sickness in Fleets, during their long Cruises and Voyages, I must beg Leave further to suggest— That the draughting of Men for special Services, if it can be done, could not fail of having a good Effect in the Service. The Rank of the Captain, and the present Fitness of the Ship, are not, perhaps, always the chief Things to be considered ; as the Condition of a Ship's Company, who are to be sent upon a distant Expedition, is a Circumstance which must needs influence, in a great Measure, the Success of the Voyage.

We observe a just Distinction made in the Army between Veterans, and new-raised Levies. But the Change of Life, from the Civil to the Military, is not so great, nor so affecting to the Constitution, as a Change to the Marine Manner of Living. If Volunteer-Landmen, and new-raised Marines, were at first incorporated with Seamen, on Board armed Vessels, Tenders, and small Ships of War only, it should seem that, by this Means, they would not only become good Sailors in a shorter Time, but would gradually acquire a stronger Constitution, fitted for the Marine Duty, without running the Risk of Sickness at first, or of Laziness and Indolence afterwards, from want of Exercise, these

small and well-aired Ships being always the most healthful, and most employed. Whereas, on the contrary, it is observable, that large Ships, on first fitting out, especially the capital ones, are more liable to Sickness, even when lying at *Spithead*, or in Harbour; so that the Draughts made into them, should be of seasoned healthy Men from other Ships, and of such Landmen as have been somewhat inured to the Sea.

If it be said, that the large Ships, when manned with a seasoned Crew, are observed to be very healthy; yet there is more Caution seemingly requisite to prevent Sickness being introduced among so great a Number of Men, than in Ships of a smaller Complement.

When a Squadron is fitted out for a long and dangerous Voyage, no Method would, perhaps, promise greater Security for future Health, than to make Draughts chiefly of such Men, from the smaller Frigates, as had been for some Time healthy and seasoned to the Sea; including in these, as many as offer of such Sailors who had been accustomed to the Climate. This I am obliged to take Notice of, as a very different Method is often followed. When there is Choice of Men, the Captains generally prefer the most able-bodied

raw young Fellows. But it has been evinced, by fatal Experience, that such vigorous Constitutions are more liable than others to be cut off by violent Fevers in hot Climates ; nothing is more common than for such Ships to lose their best Men. Whereas many hardened veteran Sailors are sometimes to be met with, who enjoy a better State of Health in the *West-Indies* than in *Europe*, having been long seasoned and inured to that Climate, either in the King's, or in the Merchant's Service.

A Crew of such Men not only carry out a Constitution suited to the Climate, but, being prepossessed in its Favour, are entirely void of those Apprehensions, and that Dread of Sickness, which prove hurtful to unseasoned *Europeans*.

Large Men of War ought to have as many as offer of these Hands : And, in the Course of the Voyage, it might be proper to have them recruited from the smaller Ships, as all new Sailors will continue much healthier, and become sooner seasoned in small Cruisers.

What I have thus far proposed, I am sensible may be often found incompatible with

the immediate Exigencies of the Service; and is, with due Deference, submitted to the Consideration of superior Judges, and of those who have the Superintendance of the medical Marine Department.—I now pass on to what is more properly the Subject of this Essay, *viz.* To propose the most effectual Methods of preserving the Health of the Men at Sea, and of preventing the various Distempers incident to them in different Climates, and which proceed from their peculiar Circumstances and Situation.

I shall begin with such Maladies as are usual in northern Climates, and among the Channel Cruisers.

Though an intense Degree of Cold, if the Air is at the same Time pure and dry, is productive of few Diseases, when Seamen are sufficiently cloathed, and kept in due Exercise, yet such a State of Air is not often met with at Sea in northern Latitudes, nor by our Channel Cruisers in the Winter.—The Season is then, for the most Part, unsettled, cloudy, moist, and rainy, and the Men must necessarily undergo an extraordinary Fatigue, during the inconstant and tempestuous Weather which they are almost continually engaged with. The usual Consequences, are

Colds

Colds, accompanied with feverish and inflammatory Symptoms, and especially rheumatic, pleuritic, and peripneumonic Complaints. These latter Cases require plentiful Evacuations, chiefly Blood-letting ; by the early and free Use of which, many Consumptions, as also chronic Rheumatisms, an afflicting Ailment to old Sailors, may be prevented.

Now as most Disorders, especially catarrhal Fevers, usual at this Season, are probably owing to a Stoppage of Perspiration ; hence, whatever promotes that necessary Evacuation, seems to promise the most certain Protection against these Evils. And, for this Purpose, I would in the first Place, by Way of Diet, recommend a very simple Preservative ; it is, the free Use of Eschalot, Garlic, or Onions. The two former are put up with the Surgeon's Necessaries, but are so very cheap, that they may be afforded by the Purser, in *lieu* of the Savings of Oatmeal. Instead of Burgou, Water-gruel might be served in a Morning to the Men, with a proper Quantity of Eschalot, Onions, Leeks, or Garlic, boiled in it. This will be found as wholesome a Mess as can well be contrived for Seamen at that Season. It is an antiscorbutic, as also a tepid, relaxing, perspirative Diluent ; and Food possessed of these Properties, is the proper Antidote to

the

the hurtful Influences of cold bad Weather at Sea.

Most of the Channel Cruisers have a Quantity of Brandy put on Board to be served to the Men, when the Small-beer is expended ; but there is often Occasion for it sooner ; because, during a violent Storm of Wind, or in bad Weather, or when the People are kept constantly wet and chill, and undergo an uncommon Degree of Fatigue, Small-beer does not sufficiently support their Strength and Spirits. Upon this Occasion, an Allowance of half their quantity of Small-beer, and a Quantity of Brandy, equal to the Remainder, would be found very beneficial. It should be mixed up in the following Manner : To a Pint of Small-beer, add a Quartern, or fourth Part of a Pint of Brandy ; let it be sweetened with Molasses, and acidulated with Vinegar, so as to be made palatable. This is a celebrated Beverage in the *Russian* Army, where it is called *Ashbetten* ; no Regiment marches without carrying a Cask of it along with them : And it is by this corroborative Drink, the Men are supported, and enabled to undergo their long and fatiguing Marches. They indeed use Honey instead of Molasses ; and their Physicians have lately made some Improvements in the Composition, by an Infusion

sion of Gentian, and other aromatic Bitters in the Spirit; which would seem, however, to be of no great Consequence.

This Draught will be found much wholesomer than un-diluted Spirits ; the serving of which to the Men, towards the End of their long Cruises, contributes often to excite general and fatal Scurvies in the Fleet. The Fermentation occasioned by the Molasses, or Honey, and the Addition of Vinegar, or, in its Stead, Cream of Tartar, as shall hereafter be mentioned, will in some Measure serve to obviate that, and some other Maladies usual in these Cruises.

But, at the same time, it is necessary to observe—That dry warm Cloathing and Bedding, are of the greatest Consequence in Winter, and without which, other Means of preserving Health will have little Effect. Every Man should be obliged to furnish himself with at least two Flannel Under-Jackets, an Article which ought to be added to the Purser's Slops. They are generally the most naked and ragged Fellows who are attacked with the Winter Diseases. When the Hammocks are carried up to Quarters, they ought always to be covered with a painted or tarred Canvas, kept for the Purpose ; and it ought to be particularly

particularly remembered, that humid Cloaths and Bedding are frequently a leading Cause of Sicknes in a Ship.

The Scurvy is a Disease common in the Winter and Spring, and very fatal to Seamen in the Channel Cruisers. But ample Directions have already been given for the Prevention and effectual Cure of this Calamity.*

I cannot, however, omit taking Notice of one Thing : When large Squadrons of Men of War are kept constantly employed in the Channel Service, the Length of their Cruises, generally from ten to thirteen Weeks, often occasions a great Sicknes; and of late a greater Mortality has been observed, than could well be expected in such a healthy Climate. When so long a Continuance at Sea is indispensably requisite, the following has been proposed as a most excellent and effectual Expedient, to preserve the Health of a Fleet.

One of the Press-Tenders might be ordered out once a Fortnight from *Plymouth*, to repair

* Dr. *Lind's* Treatise on the Scurvy, especially Chap. III. Part 2; where many more Directions concerning the Preservation of Seamen, both in Health and Sicknes, are delivered; and which is deemed unnecessary to repeat.

to the Rendezvous or Station of the Squadron, loaded with live Cattle and Greens, to be served to the Men by the Purser, in *lieu* of their salted Meats. The Men on Board of her should have the Privilege of carrying out, for their private Advantage, all Manner of Roots, Fruits, and Vegetables, to be sold at a reasonable Rate in the Fleet: By such Means, a Market of Greens and Fruits might constantly be kept by Sutlers, who should be only prohibited the Sale of Spirits. Onions, Leeks, Shallots, Turneps, Cabbage, Carrots, Apples, fresh soft Bread, Cyder, Lemons and Oranges; or even the most common Herbs in their Season, which grow in great Plenty wild in the Fields about *Plymouth*; such as Dandelion, Water-cresses, Brooklime, and the like sovereign Antiscorbutics, would prove a high Refreshment to the Men; and would soon be bought up by them either with Money, or, if that is wanting, in Exchange of their Savings of salt Meat and Biscuit, which are commonly sold to the Purser for ready Money, which is expended in pernicious Drams.

The Run of the Storeship, or Tender, from *Plymouth* or *Ireland*, to the Fleet, will seldom, with a fair Wind, prove above forty-eight Hours. Many Sorts of Greens may be preserved for any Length of Time, by a Method

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afterwards to be described. But there are some Articles which the Sutlers ought to be obliged at all Times to carry out, and be provided with, in Proportion to the Rate of the Ship, upon Pain of forfeiting their Licence. These are either the Rob of Lemons, or Juice of Oranges;* and the Juices of the above-mentioned common antiscorbutic Herbs, which being mixed with a sixth Part of Brandy, will remain good for many Months.

It is hardly to be supposed that any Man, who has the least Tendency to a Scurvy, would not willingly part with a Piece of salt Beef, or a Pound or two of Biscuit, to purchase these obvious Means of Health, and a Reprieve from dying of a most painful and loathsome Disease. By a proper established Regulation of this Sort, not only some thousand Lives might be preserved; but the Ships would be enabled longer to keep the Seas, and not be often under the Necessity of quitting their Station, on account of a sickly, dying, and dispirited Crew.†

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* See Dr. Lind's Treatise on the Scurvy, Page 162.

† The remarkable good Effects of supplying the Fleet with fresh Provisions and Greens at Sea, and in the Bay of Biscay, have now been fully experienced in the grand Fleet under Sir Edward Hawke and others, Anno 1759,

I shall now conclude this Part of my Subject, with some Directions which may be of Use to particular Persons, in their cold Winter Cruises.

The most proper Spirit a Man can well use by way of a Cordial Dram, at this Season, is Garlic Brandy. He will find a much less Quantity of it, than of the pure Spirit warm his Stomach; and it will keep the Breast, Skin, and Kidneys, free from Obstructions. But here it may be worth while to subjoin a Caution, which is, that when a Man is almost chilled to Death by the excessive Cold, as I have known some by falling asleep in their Watch upon Deck, a Dram of any Spirit often proves instantly fatal. In this State he ought immediately to be put to Bed, and to swallow a Draught of some warm thin Drink, such as warm Water, Water-gruel, Sage-tea, or the like; and afterwards the distilled Spirit will prove less dangerous, and more beneficial, in restoring Warmth. Private Messes will reap Benefit in cold rainy Weather, by the Use of Sage, Sassafras, or a few toasted

1760, &c. by which Means our Sailors were preserved in the most perfect State of Health. But I shall have Occasion to give a more particular Account of this elsewhere.

Juniper Berries, infused as Tea, with the Addition of a small Quantity of Garlic Brandy.

It may be of further Use to observe in this Climate, it is not the Degree of Cold in the Air which affects Health so much, as the sudden Changes from Heat to Cold, or from Cold to Heat; *also* the Dampness of Air—And that a Man will not be near so subject to take Cold when he is wet upon Deck, and using Exercise, as when afterwards he goes below Deck, and sits long at Rest in his wet Cloaths; and especially when he sleeps in them, or in a damp Bed. Nor will he at any Time be so liable to be affected in his Health by the Weather, if, before going upon Deck, he either eats somewhat, or drinks a little of the *Ashbetten*, with a Bit of Biscuit, as he would be if the Stomach was quite empty.

One Cause sometimes of general Sickness, we must not here omit to mention. This is the Freshness of a Ship's Timbers: A Vapour constantly exhaling from the Wood may be felt, and is often seen by Candle-light in a well illuminated Ship.—It appears sometimes like a thin Mist, and at other Times like a luminous Stream. A prevailing Dampness is likewise evident in the Mould and Rust with which every Thing liable to either,

ther is affected. It produces ill-conditioned irregular Fevers, accompanied with a Diarrhoea and anomalous Symptoms. These bad Consequences, it is much easier to prevent in the Dock-yard, than after the Ship is built : For, notwithstanding repeated Fires made to dry the Timbers, this Sweating of the Wood will continue for some Months, in a cold Country. Fumigating the Ship frequently, when at Sea, with the Steam of Tar or Pitch, may, perhaps, be found to correct, in some Measure, this pernicious Vapour; which is experienced to be attended with fewer bad Consequences in small well-aired Vessels, than in larger Ships. It is certain that very large new-built damp Men of War, are not altogether so proper for long and sickly Voyages, as those which are dry and well seasoned.*

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* This Article not sufficiently attended to, well deserves Consideration. Experience, the Test of Truth, confirms the Inconvenience which Seamen suffer from the Vapours which exhale in a recent built Ship.

Whether the Exhalations from the sappy Wood operate otherwise than as simple Moisture, may admit of some Conjecture. In many Instances where the Smell cannot distinguish the Presence of any Effluvia, they will, however, exert no inconsiderable Influence. Thus, Turners, in working the Wood of the Mancha-neel-Tree, would be severely affected, did they not securely guard against its Virus. The *Halitus* of a Field

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When the Service demands any formidable Succours to be sent abroad, the *Mediterranean* seems to enjoy that happy Mediocrity of Climate to which such damp Ships might be, to the greatest Advantage, appropriated; for a Climate subject to a moist Air or Atmosphere, like our own, or that of the Channel, would protract the Seasoning of the Wood, as the Extreme of the torrid Zone would also have its Inconveniences. What still adds to the Prejudice of the Men, and may be a needful Caution to all, is the preposterous Custom of washing the Decks after Sun-set. For, in whatever Country or Season this Method is pursued, it cannot fail of being greatly detrimental to the Seamen's Healths.

of Poppies has been known to induce a sleepy Disposition in the By-stander. The Exhalations of *Fraxinella*, and some other Plants, are said to be luminous in the warmer Countries in a very dry and calm Season: And the celebrated *Van Swieten*, in the early Part of his Life, suffered, repeatedly, a temporary Loss of Memory, from the Vicinity of a Plant to him. Vapours from Wood, especially when inclosed as in a Ship, may, besides their common relaxing Quality, convey Indisposition peculiar to their respective Natures. This by Way of Speculation.

I have lately observed, that Ships built of dry seasoned Wood, and especially where Wood Fires are often burnt betwixt Decks, are exempt, by these means, from Sicknes.

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For the Preservation of the Crew in a southern Voyage, Methods very different from what have been directed, will be found requisite. And as in these Voyages, on account of their Length, Variety of Climates, and the unhealthy Harbours Ships often put into, they incur a greater Risk of Sicknes, and are with more Difficulty recruited than in *England*, therefore I shall treat this Part of my Subject at greater Length. But before I proceed to the Diseases incident to the Men in those Climates, it may be proper to premise some general Directions for their Preservation.

In an intended Voyage to the Coast of *Guinea*, the *East* or *West Indies*, the first Point of Consequence to the future Healths of the Men, seems to be to make such a Change in the Diet or Ship's Provisions, as may prepare the Body for the Alteration it must necessarily undergo, by passing from a cold to a warm Climate.—Every one's Experience must convince him, that both the Appetite and Digestion are considerably impaired in hot Weather. And it is the same in sultry Climates.

Instinct has taught the Natives between the Tropics to live chiefly on a vegetable Diet of Grains,

Grains, Roots, and subacid Fruits; with Plenty of thin diluting Liquors. Whereas a full animal Diet, and tenacious Malt Liquors, are found to be better adapted to the Constitution in our own, and other northern Countries. We observe the Sailors in Winter, and especially such of them as visit the *Greenland Seas*,* to be remarkable for a voracious Appetite, and a strong Digestion of hard salted Meats, and the coarsest Fare. But the same Men, when sent to the *West Indies*, become soon sensible of a Decay of Appetite, and find a full, gross, salted Diet pernicious to Health.—It is, indeed, a Truth evinced by most fatal Experience, that their devouring of large Quantities of Flesh Meats, and using the same heavy obdurate Food in the *West Indies*, or upon the Coast of *Guinea*, and in other warm Countries, as they were accustomed to at home, have proved the Destruction of many thousand *English* in those Climates.

The first Step then to be taken, with a View to preserve the Health of a Squadron of Ships bound on such Voyages, would seem to be to diminish the Quantity of salt Flesh Provisions. This becomes the more necessary in such a Voyage, as the Men are, for the most

* See the Bishop of *Bergen's History of Norway*, Vol. II. p. 271.

Part, put to short Allowance of Water.—Now nothing can be more pernicious to a Ship's Company, than a full Diet of salted Beef and Pork, and at the same Time a small Quantity of Water. This is productive of scorbutic and many other Diseases, fatal at Sea, which no other Measure can avert, but a Diminution of the Government's Allowance of Beef and Pork, in Proportion to their Scarcity of Water. There remains another very material Objection against a full Diet of salted Flesh in hot Climates. It is this ; that no Beef or Pork can possibly be preserved, by Sea-salt, free from a Taint or a Degree of Putrefaction, as evidently appears by the greenish Streaks in the Fat.—This might possibly be prevented by the Addition of a little Nitre in salting, whose Virtue is allowed to be proportionably enforced in the warmer Latitudes. But such Considerations being foreign to my present Purpose, I shall only observe, that as almost all Diseases in hot Climates are thought to be of a putrid Nature, so Flesh, which has a putrid Tendency, cannot fail, in some measure, of contributing to their Production.

There are not wanting Instances of the good Effects attending this Method of putting the Ship's Company, in long Voyages, upon

a very short Allowance of salt 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 the last War, the Men belonging to the *Sheerness*, bound to the *East Indies*, apprehensive of Sickness in so long a Voyage, petitioned the Captain not to oblige them to take up their salt Provisions, but rather to permit them to live upon the other Species of their Allowance. Captain *Palliser* ordered, that they should be served with salt Meat only once a Week, *viz.* Beef one Week, and Pork the other. The Consequence was, that after a Passage of five Months and one Day, the *Sheerness* arrived 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 uncommon and remarkable Healthfulness, in so long a Run, to their beneficial Effects: But it was soon discovered, that, by the Neglect of the Carpenter, the Cock of the Pipes had been all this while kept shut. This Ship remained in *India* some Months, where none of the Men, excepting the Boats Crews, had the Benefit of going

going on Shore; notwithstanding which, the Crew continued to enjoy the most perfect State of Health. They were, indeed, well supplied there 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 had there, they eat their full Allowance of salt Meats, during a Passage of only ten Weeks; and it is to be remarked, the Air-pipes were now open. The Effect of this was, that when they arrived at the *Cape*, twenty of them were afflicted, in a most miserable Manner, with scorbatic and other Disorders. These, however, were speedily recovered on Shore by the Land Refreshments.

Being now thoroughly sensible of the beneficial Effects of eating, in those southern Climates, 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 Allowance of salted Flesh. And thus the *Sheerness* arrived at *Spithead*, with her full Complement of 160 Men in perfect Health, and with unbroken Constitutions; having, in this Voyage of fourteen Months

and fifteen Days, buried but one Man, who died in a Salivation for the Pox.

I have been told, that, according to the Regulations made for the Sick in the *French* Service, every Squadron, consisting of a certain Number of Ships, is provided with a Tender, to carry out Necessaries for the Diseased. The principle Articles are, live Stock, Flour for fresh Bread, Wine, &c. The fresh animal Provisions must needs be of great Benefit to the Diseased, though a larger Quantity of them be more indispensably necessary both in the *French* and *Spanish* Fleets, than in ours, because the *English*, in medical Practice, do not permit the Use of Flesh Soups in Fevers and other acute Distempers, which the *French* and *Spanish* Practitioners do.* These Flesh Soups, when required at Sea, might occasionally be

* The *French* Allowance for their Sick, is said to be eighteen Ounces of soft new-baked Bread, and Three-fourths of a *French* Pint of Wine a Day. They carry out Fowls of all Sorts, Bullocks, Sheep, Kids, Eggs, &c. which are distributed to the Patients according to the Direction of the Surgeon. Their other Necessaries are pretty much the same with those furnished to *English* Men of War, viz. Rice, Barley, Sugar, Tea, Prunes, Raisins, Vinegar, Spices of all Sorts; also Butter, Oil of Olive, &c.—We indeed have, perhaps, a better Assortment of preserved Fruits, which are extremely useful, such as Tamarinds, Currants, preserved Ginger, &c.

prepared at any Time of a portable Soup, which the Shins, the Necks, Hearts, and other Offal of the Cattle, killed at the Victualling Office, might supply. The portable Soup of Mutton, as less viscid (which Viscidity, indeed, Dilution will correct) or a Junction of both, might, occasionally, give it an acceptable Variety and Relish to sick and delicate Stomachs.

Besides the Satisfaction which would arise in common, from conferring Benefits on the Sick, the most divine of Charities, the Advantages, which those in a convalescent or recruiting State would derive from this Establishment, would abundantly recompence to the State, the apparent additional Expence, as the Preservation of its Naval Subjects would, in the End, prove the most frugal Plan.

This refreshing Sustenance, and, I may add, inspiring Cordial, on the most important Occasions in our Navy, has been long an Article among the lamented Wants, amidst the acknowledged Care and Humanity that the several honourable Boards of Marine Department have variously exercised.

Fermented Bread too, from its being sooner subdued, and assimilated into Nourishment by the weakened digestive Powers, as well as
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on account of the Inability of Scorbatics to chew a harder Substance, might be very advantageously allowed the Sick. Nor could the Quantity consumed by them, though daily made aboard, be any Inconvenience to the necessary Oeconomy and Business of the Ship. An Addition to the Leaven of a little *Castile* Soap dissolved in Water, makes a Bread of the most easy Digestion.

Wine has likewise its Merits: It is found in many Fevers, especially towards their Decline, to exceed, by far, the Shop medicinal Cordials. Add to this, that when the Fever is entirely gone, it proves the best and quickest Restorative which a Sailor can have at Sea. Rum, or other distilled Spirits, in whatever Manner diluted or acidulated, do not, in such Cases, produce the like Effects. It will also appear in the Sequel, that the Use of Wine becomes an excellent Means of Preservation against the Infection of contagious Diseases in a Ship. To answer these salutary Purposes, I would advise, that, before the Stock of *Madeira*, *Canary*, or other Wine, is quite expended, some Casks should be reserved for the Use of the Sick in the Voyage. This may be issued to them at proper Seasons, as the Surgeon may direct, in *lieu* of Rum, or whatever Spirits are in Use at the Time.

I am of Opinion, that proper Regulations for preventing the Abuse, and improving the Benefit that may be derived from such vinous and spirituous Liquors as are allowed to the Men, cannot fail, at all Times, to have a very remarkable Influence on the Health of the Crew. The Abuse of these Liquors, more especially the swallowing down large Quantities of undiluted Spirits, is of the most fatal Consequence in every Climate, and has been the Bane of many thousand Mariners; while, on the other hand, it is most certain, that by proper Management, these noxious Draughts might be converted into a sovereign Remedy in unwholsome Climates. This, the Sea-Officers, who drink more of them than the common Men, daily experience. Observation has indeed sufficiently instructed us, that distilled Spirits, well diluted and acidulated, and used in a moderate Quantity, are wholesome, and proper for healthy labouring Men in hot Weather. Somewhat is requisite to support the Strength of such People, and perhaps Punch is the most salutary Liquor that can be contrived to answer this Purpose; besides its immediate cooling, refreshing, and invigorating Quality, it is, in the Whole, well adapted to prevent the Diseases arising from hot and moist Weather, and the Tendency to Corruption in the animal Juices, which is thence supposed to be induced.

If the *West Indians* could fall upon a Method of making such large Quantities, at a Time, of the Rob, or inspissated Juice of Lemons or Limes,* as would reduce them to a low Price, Mariners, and all other Inhabitants of the Torrid Zone, might then be supplied with a noble Preservative of Health, in sultry unhealthy Climates. One of the greatest Physicians † of the *Indies* makes the following Remark: “The most knowing Practitioners in *India* place greater Confidence in Lemons against the malignant Diseases, pestilential Fevers, &c. of the Country, than in costly Bezoar or Theriac. For my own Part, says he, I affirm, that in my Practice there, I found more Benefit from them, than from any one simple Remedy.”

Syrup of Lemons ought always to be put in the Surgeon’s Medicine Chest, and be occasionally prepared and renewed in a sufficient Quantity, at every Port, where these Fruits are cheap and in Season. Orange Juice, an excellent Succedaneum from Lemons, may be preserved, during the Course of the longest Voyage, in the following Manner. Care must first be taken to squeeze only sound Fruit, as

* See Dr. *Lind’s* Treatise on the Scurvy, second Edition, p. 162.

† *Bontius de Medicina Ind.*

a tainted Orange will endanger the spoiling of the whole; the expressed Juice must be depurated by standing a few Days, or filtrated till it is pretty clear; then it is to be put into small Bottles, none of them containing more than a Pint of Juice; in the Neck of the Bottle, a little of the best Oil of Olives is to be poured, and the Cork well sealed over.

I cannot dismiss this Subject of preserving Fruits, and their Juices, at Sea, without taking Notice, that, by repeated Experiments, I find it very easy to preserve Greens, Pot-herbs, and proper Vegetables, a sufficient Time at Sea. The Method; however simple, is effectual; and although it may be deemed inconvenient to carry out a sufficient Quantity for the daily Use of the whole Ship's Company, yet particular Messes may reap great Advantage from it.

All have it in their Power to enjoy the green and fresh Productions of Nature; and surely Men, the most regardless of their own Health, must esteem a Dish of Greens with their salt Meat as a Delicacy, after having been some Months at Sea. The last Experiment I made, was this: On the 5th of *March*, I took a Parcel of Common Coleworts and Leeks, and, after washing them clean, shook the Water well off, and cut the Leeks into Pieces of an F Inch

Inch or two in Length, and stripped the Coleworts from off the thick Stalks; then having procured two wooden Dishes, well seasoned with a strong boiled Pickle of Salt, I sprinkled, when dry, a thin Layer of pounded Bay-salt on the Bottom of each, upon which was spread a thin Layer of the Vegetable, covered with dry Bay-salt, and so alternately, until the one was filled with Coleworts, and the other with Leeks. A Cloth, wrung out of boiled salt Pickle, was afterwards put upon the Mouth of the Vessel, and the whole pressed down with a Weight. On the 5th of June, after they had been kept three Months, I took out a little of each, and observed the Leeks to retain their strong peculiar Flavour. After opening the Folds of the Leeks, in order to wash out the Salt, the Vegetables were put, for about ten Minutes, into cold Water to freshen, then to be boiled; when, upon a Comparison, both of them were found, in every Respect, equal to what had that Morning been taken out of the Garden. The entire Verdure and Tenderness of the Coleworts, and the perfect Flavour of the Leeks, were preserved, without the least Degree of any saline Impression.

At this Time of writing, the 5th of January, Greens, having been kept for ten Months, still retain, when prepared as above,
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for boiling, their perfect Verdure, Succulency, and Taste. It is needful to add this Caution, that earthen Vessels are improper for preserving Greens in this Manner, because the Salt in a short Time will penetrate their Substance, and the Outside of the Vessel become crusted over with saline Efflorescencies.

Further, I have with Garden Cresses Seeds, which had even been kept for two Years, raised a Salad in the Middle of Winter, in a Room where there was no Vegetation abroad: and the same is practicable in all Parts of a Ship. Let wet Cotton be spread thin on the Surface of Water, about two or three Inches from the Bottom of the Vessel, to give room for the Roots to shoot down. The Seeds being sown upon the Cotton, the Cresses will in a few Days come up.

The Water here used is not lost, it becomes strongly impregnated, both with the Flavour and Taste of Cresses; and is converted into a powerful Antidote against the Scurvy.

It is beautiful, in a Glass Vessel, to behold the daily quick Progress of Vegetation, both above and below the Surface of the Cotton.

When there is a Plenty of Water on board, or in a rainy Season, all the old Blankets may

then be converted into Gardens; and the whole Ship both above and below, as also her Sides, be replete with Verdure. Nothing more, as I find by Experiments, being requisite, than watering the Blanket on which the Seeds are sown, twice a Day in this Climate, and allowing two Inches Room for the Roots to shoot.

But to return from a Digression, which I hope will not be deemed useless. For want of the aforementioned Fruits, or their Juices, or Shrub, I would suggest another vegetable Acid for the Use of the Navy, which is the Cream of Tartar. A Dram, or the eighth Part of an Ounce of this, will be sufficient for each Man a Day, and for half a Pint of Spirits, mixed with a Pint and a Half of Water. This Cream of Tartar is the vegetable essential Salt of Wine, and is an agreeable Acid. If the Officers, and others in the Ship, who make Use of Lemons or Oranges, would reserve the Peels to be put into the Spirits served to the Men, it would greatly improve the Flavour of the Punch, and make it little inferior to what is made with Lemon-Juice. I must add, that this is so innocent an Acid, that it may be taken in the Quantity of an Ounce or two, without producing almost

most any sensible Effect, except gently moving the Body.

It has hitherto been the Aim of those, who have made Marine Diseases their Study, to find out a proper agreeable Acid, which Sailors might be induced to use, as the best Preservative against many of their Diseases, which have been supposed to be mostly of a putrid Nature. Vinegar, Spirit of Salt, Elixir of Vitriol, and many others, have been severally recommended, and have been experienced, under proper Circumstances, to have produced good Effects : Cream of Tartar has the Advantage not only of being much more palatable than any of these Acids, and, according to the Sentiments of Doctor *Boerhaave*, and my own Experience, beneficial, and well adapted to the Constitution of Mariners ; but is also the cheapest Acid that can be recommended for the Purpose. An Allowance of the eighth Part of an Ounce a Day, will not cost the Government one Shilling yearly, for each Man in the *West Indies*. I imagine the best Method is to pour a Quantity of boiling Water over-night on the Cream of Tartar, and next Morning a pure transparent Liquor, pleasantly acidulated, may be poured off from the Tartar at the Bottom. Bad Water is even thus corrected and purified. About two Pounds and a Half of the Cream,

Cream, I think, will be sufficient to acidulate a Hogshead of Water : Or, as it is now a general Practice to mix Water with the Spirits, before serving them to the Men, a due Proportion of this Acid may be issued to each Mess, it being certain, that there are but few who would not prefer the Use of such an agreeable Acid, to Water and Rum only : And each Man having it in his Power to exchange Part of his salt Provisions (which are so detrimental to Health in hot Countries) with the Purser for Sugar, may then be daily supplied with a Quart of excellent Punch : Nay, even an Increase of the ordinary Allowance of Punch, provided it is served out at different Times of the Day, may safely be indulged, in *lieu* of the baneful salted Meats ; the inflammatory Quality of the Spirit being greatly corrected by mixing it in this Manner. Hence, the Whole becomes a salutary Composition of a cooling, corroborative, antiputrid, and diuretic Nature.

The opposing Quality of Acids to the intoxicating Power of Spirits, is observable on more Occasions, than that of the Analysis of Wines. From a Mixture of Vinegar and Alcohol, will result such a Combination, as shall efface the different Tastes of the *Menstrua* in their separate State ; or, in other Words, obliterate, in a manner, those Properties by which

which they are usually distinguished. The high ardent Nature of the one becomes thus qualified and attempered by the other. And hence, whilst we are upon the Subject of potable Spirits, one Piece of Advice may not be unacceptable, in an unpitied, but sometimes dangerous Condition : I mean, the voluntary Disease of Drunkenness ; a State from which Numbers never wake, and many but return to Memory, to fall the Victims of the Fever it produces : A Caution therefore may be the more needful, as it is a Case too frequent on Ship-board, and as I do not remember that its Treatment has been often spoke of.

In the Fit of Stupefaction, it is but too usual for the Delinquent to lie in an horizontal, or, what is much worse, an head-depending Position. This Situation should be immediately altered to an erect, or gently-inclined sitting Posture. If in a Bed, or Hammock, his Head should be raised, and a due Care taken that his senseless State does not change it. Warm Water, well acidulated with Mineral Acid, or Vinegar, or the Juice of Fruits, should be given him, and a Spunge dipt in Vinegar, applied to his Head, Mouth and Nose. Instances of the good Effects of this Method have been frequently experienced.

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The Necessity there may be sometimes for blood-letting in this Case, is almost too obvious to inculcate, as well as an Emetic of gentle, but speedy Operation; Immersion of the Feet in warm Water, solutive Clysters, or whatever else may abate Distention, or take off from the Pressure above: These, I say, with plentiful Perspiration, (generally a salutary, but now a most needful Evacuation) are the usual Methods when any Extremity threatens. Those who can walk in the Air, or sit up with an over Dose of Liquor, will do well to embrace that Security, till the Kidneys, or some other Strainer, has abated the Surcharge; for going suddenly to sleep in an inebriated State, has, by Suffocation, or Apoplexy, put a Period to many Lives. This Vice of Drunkenness, one of the most destructive to our brave Seamen, ought to be discouraged by all possible Means, and severely punished by the Officers.

But let us turn our Eyes to those in a State more justly demanding the Attention of Humanity; such as have been unfortunately drowned. So soon as a Person supposed to be drowned is taken out of the Water, he ought not, as usual, to be held up long by the Heels; the Continuance in such a Posture is the most likely Means to prevent him from coming to Life. The Head must be inclined in a Position

tion favourable to empty the Stomach ; mean while the utmost Dispatch is used to remove all the cold, wet Cloaths, by stripping the Person quite naked, and immediately exposing the Body to the Heat of the warm Sun, or a Fire, to prevent Stiffness and Cold ; or, to regenerate Heat, he may be put in a Bed well warmed, where the Belly, Breast, and especially the Pit of the Stomach, must be well and constantly rubbed with warm Clothes, keeping the Head and Face gently inclined forwards, as in a Person under the Operation of an Emetic. At the same time, the Limbs must be well chafed with hard coarse Clothes, made very warm, and the whole Body often shook or rolled about. All possible Attempts must be made from the Beginning to bleed ; and these in different Veins. The temporal Artery may also be cut. Warm Bricks, Irons, or Bottles of Hot Water must be applied to the Feet ; volatile Salts, and stimulating Spirits to the Nostrils ; and Air, moderately heated by being near the Fire, blown by means of a Bellows into the Anus and Lungs. Or, a Person that chews Garlick may endeavour to blow into the Lungs with his Breath, keeping the Nostrils of the Patient shut for a few Seconds of Time, to prevent its Escape : mean while, another Person, by a gentle alternate Pressure and Dilatation of the Ribs, with a correspond-

ing alternate Compression of the Contents of the Belly upwards, imitates as near as possible the Act of Respiration in a living Body. A Clyster of Tobacco Smoke may also be given, and Tobacco moistened, or its Juice, may be put into the Mouth, from the Stimulus of which in the Throat and Stomach, a Recovery and Vomiting has sometimes ensued. Though these Means should not speedily produce the desired Effect, yet the Person is not to be relinquished. They must be repeated and continued for some Hours, keeping the Body all the while warm, or in a hot Place, persevering in the Concussions and Rollings; and lastly, he may be immersed and kept for some Time in a Bath of luke-warm Water, after which, the former Means are to be again essayed.

When a Person is suffocated by the noxious Vapour of a Ship's Well, (an Accident not uncommon) the same Means are to be used for his Recovery, as have been prescribed for People drowned; only there is here no Occasion to strip him of his Cloaths, till other Methods have been practised, especially opening the Veins, &c.

And a like Method may be practised with those struck with Lightning. Accidents from Lightning are frequent on Ship-board, often

often owing to the Height of the Masts, from which it is thrown upon the Deck. Perhaps future Experience may evince the Utility of having proper Conductors fixed at the Mast-head, or in the Shrouds ; by which the Shock may be carried off from the Ship into the Sea.—Mean while, it is adviseable for the Preservation of the Men who are exposed to it upon Deck, that, during violent Thunder and Lightning, the Officer takes the first Opportunity of a heavy Rain falling, to employ them in some Ship-duty, with a View that their Cloaths may become wet.

If this cannot be complied with, let some Artifice be fallen upon, that at least the Hats of all the Men in the Watch be dipped in Water. This may be effected in way of Play, or Diversion, among the People, without their knowing the Reason of it.

As to the Officers of the Watch, they may wear a waxed Cap or Oil-Cloth, as it is called, on their Heads ;—and all should avoid standing too close to the Foot of the Mast, or to the wet Shrouds or Ropes coming from thence.

The Principles upon which those Advices are founded, are too well known to require my dwelling longer on this Subject.

I should be wanting in my Duty to the Public, if I should omit, in these general Directions for the Preservation of Seamen, the Use of Doctor Hales's Ventilators *, the most beneficial Invention for Mariners, which this Age has produced. I must add, that the more the Men are kept in Exercise and Action during fine and calm Weather, the better will their Health be preserved: And it is each Man's Interest to take care, that his Chest, Cloaths, and Bedding, be often aired, and kept as free as may be from Damp and Rottenes. Those, who are remiss in these Articles, should be compelled to become more cleanly.

The ordering as many of the Men as can be prevailed upon to use the cold Bath, either in Tubs under the Fore-castle, or to dip in the Sea, early in the Morning, has been found extremely beneficial in warm Weather, and in hot Countries. The Body is thereby cooled and refreshed, the Fibres braced and invigorated, so that the Men become afterwards better enabled to undergo the Fatigues and Heat of the Day. This would prove not

* See his Book on Ventilators.

only an excellent Means of Health, but of Cleanliness : And indeed it has been found experimentally true, that the cold Bath is of sovereign Use to the *Europeans* in the Torrid Zone ; and that by cleansing the Skin, and invigorating the whole Habit, it is so far from stopping the plentiful and necessary cuticular Discharges in hot Weather, that it promotes them. I can affirm, from my own Experience in hot Climates, that many Diarrhoeas, and other Complaints, the pure and sole Effect of an unusual and great Heat, (relaxing the System of the Solids, and occasioning a Colliquation of the animal Juices) have not only been cured by Cold Bathing, but the Return, and even the Attack, of such Diseases, effectually prevented by it.

I am persuaded that the remarkable Healthfulness of the *Tyger* Ship of War, commanded by Captain *Latham*, in her late Voyage to the *East-Indies*, was more owing to the Use of the Cold Bath, than to any other Circumstance regarding the Ship, or her Company *. It is indeed worthy of Observation,

* See a Letter from Captain *Latham*, inserted in the Gentleman's Magazine, in the Month of April, 1755. It is dated from St. *Augustin's Bay*, in the Island of *Madagascar*, 9th of September, 1754.

that,

that, in this Voyage, two Ships kept together in Company, and were pretty much of the same Rate; yet, at the End of the Run, one of them had above two hundred Men sick on board, whilst the other had not above nine or ten. This proves, I think to a Demonstration, that very minute Circumstances in a Ship often occasion, or prevent, a general Sicknes, and consequently a great Mortality in a Voyage.

Most People know, that the Cold Bath, though very serviceable in sultry Weather, and at such a Time often absolutely necessary, as I have experienced in my own Person in hot Countries, yet may be injudiciously and preposterously used. The Abuses are too long Duration in the Water, or when the Sailors are permitted to go into it over-heated with Work or Liquor, when the Stomach is full, or when a critical Eruption, called the prickly Heat, appears upon the Skin.

These general Directions being premised, I proceed to treat more particularly of such Diseases as are usual, or may be apprehended, in hot, Sultry, and unwholesome Climates; with a View to point out what promises the most certain Protection against their Attacks.

The

The first Distempers which generally occur in a Voyage to the Southward, are, for the most part, of an inflammatory Nature, and owing to a sudden Transition from cold to hot Weather. This occasions a Fulness and Distention of the Vessels ; hence, such Disorders, and hence, all *Europeans*, upon their first Arrival under the Tropic, bear Evacuations much better than afterwards. It has been a common Practice at Sea, to bleed a Number of the Ship's Company, when first they come into a warm Latitude, by way of Prevention : But Experience does not shew, that this Operation has any such Effect upon their future Health ; nor can the Propriety of bleeding almost all the Men, as it is often done in the Merchant's Service, without Distinction of Age, Constitution, &c. be well justified ; though we allow Bleeding, in some particular Cases, useful at this Time, and necessary. I shall endeavour elsewhere * to particularise the Cases in which this Operation is needful ; let it suffice for the present to observe, that previous Blood-letting is not to be depended upon as a Security against the Diseases of intemperate Climates.

* In the Appendix.

It often, indeed, happens, that the Men enjoy an uninterrupted State of Health in the Torrid Zone, when the Ship meets with fine favourable Weather, and has a good Passage, and especially when she leaves *England* in the Autumn, and arrives at *Jamaica*, or other Places to the northward of the Æquator, when the Sun is pretty well advanced towards the southern Tropic : It being generally upon their Arrival in Harbour, and after anchoring in sickly Places, that the Men are attacked with the Diseases of the Country.

The contrary, however, may happen, and it has been remarked, that when Ships crowded with Men * have a tedious Passage, or are long becalmed at Sea, during a Continuance of hot, moist, and close Weather ; or when they suffer by heavy Rains, usual in their Season, within the Tropics, Diseases different from

* It is a Mistake destructive to the Men to croud too many of them together in a Southern Voyage, or in a hot Climate, as the Ship will be found, before the End of the Voyage, in much more Distress for want of Men, than she would have been, had she at first carried out only her proper Complement. An additional Number is often made, in order to supply an expected Mortality ; but they generally encrease that Mortality to double or triple their own Number. This Fact has been often confirmed by Experience in foreign Services, and lately in the *Pitt*, an *East-India* armed Ship, and several others.

the former, and much more fatal to the Men than those of the inflammatory Kind, begin to appear.

A few of the Sailors are sometimes at first seized with Fluxes, which denote a Disposition in the Air to Putrefaction, and to beget a malignant Fever of the remitting, or intermitting Form, most frequently of the double tertian Kind. This Fever, which is the genuine Produce of Heat and Moisture, is the Epidemic between the Tropics, upon the Coast of *Guinea*, and in *Jamaica*; and is the autumnal Fever of all hot Countries: It is extremely different from what is called the yellow Fever, or black Vomit, which is rare, and takes place only among a Few, on their first Arrival in the *West-Indies**. In large Ships
and

* Since the first Edition was printed, I transmitted some Queries relating to the Diseases in the *West-Indies*, to Mr. *Nasmyth*, an ingenious Gentleman, and Surgeon to Admiral *Holmes* at *Jamaica*, and received the following Answers from *Port-Royal*, dated April 15, 1761.

" Q. Is not the common Fever of *Jamaica* of the
" remitting Kind, and nearly such as has been described
" by *Clegborn*, as the Epidemic of *Minorca*?

" A. The Remitting Fever is truly one of the fixed
" regular Epidemics of this Island; and is more or less

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and Fleets, it would seem to be generated among the Sailors by Contagion, by their great

" prevalent in the Months of *October, November, and December.* I look upon it to be the same as that of *Micronesia, of Sumatra, of Java, and of many other Places in the East and West-Indies, between the Tropics.* Here, from the great Extent of Country, large Tracts of uncultivated Land, Woods, Marshes, and a considerable Degree of Heat and Moisture; from these, I say, and other Causes, this Fever is found to act with full Vigour, and often proves very fatal. It terminates sometimes as common Fevers do, by the Skin, Kidneys, or Intestines; though oftner, and with more Safety, as a regular Intermittent; when it is readily subdued by the Bark, &c.

" Q Wherein does it differ from the Yellow Fever?

" A. An Inflammatory *Diatbesis*, with dense Blood disposing to Obstruction, very commonly introduces the *Remitting Fever*: The Heat too, except in the Remission, is pretty equal; and seldom any Signs of Dissolution in the Blood, or Tendency to Putrefaction, appear, until the Disease has been of some Standing.—*The Yellow Fever*, in at least ninety Patients of a hundred, exhibits immediate Appearances of Colliquation and approaching Putrefaction. The Blood, in the Beginning, is commonly loose and dissolved: The great Heat soon subsides, when a clammy Moisture succeeds. In this State the Heat is really under the Standard of Health; and then it is that Putrefaction becomes general and active.

" Q:

great Intemperance, and constant Use of a gross, corrupted, salt Diet, altogether unsuitable to the Climate.

But

" Q Are the Patients in this last Fever subject to profuse
" Hæmorrhages, or other Symptoms of remarkable Colli-
" quation or Putrefaction of the Blood ?

" A. From the early and general Dissolution of the
" Blood, Hæmorrhages are very frequent in this last Fe-
" ver; and these too from almost every Part of the Body :
" The Gums, the Nose, the Corners of the Eyes, give
" early Proofs of this. Sometimes bloody Exudations
" from the Fore-head, the Arm-pits, from cicatrized
" Wounds, large black Spots, and fœtid cadaverous Ex-
" cretions of every Kind, confirm the general State of
" Putrefaction.

" Q. What Diseases do you imagine are produced at
" Sea, by the great Heat in the *West-Indies*, where Infec-
" tion and the Land Exhalation can be supposed to have
" no Influence ?

" A. I have remarked in the Course of some Voyages
" to the *East-Indies*, (these, you know, afford the fairest
" Trials) that the Inconveniencies and Diseases arising
" from mere Heat, are far less considerable than is com-
" monly imagined. The immediate and most frequent
" Effect of hot Air, is Rarefaction of the Fluids, hence
" different Degrees of Fever, from the accelerated Pulse,
" slight Head-ach, &c. to a Phrensy and highly ardent
" Fever.

But to return to the true Epidemic in the Torrid Zone; I have found, by manifold Experience, in the most unhealthy Rivers upon the Coast of *Guinea*, that the Safety of the Patient, in this Disease, entirely depended upon the Fever's intermitting; or at least, its remitting so favourably, as might afford an Opportunity of throwing in half an Ounce, or an Ounce, of the Jesuits Bark. The Bark is indeed, at this Time, universally known, by Practitioners of all Nations, to be the only sovereign Medicine for this most frequent and malignant Fever, in those sickly southern Climates.

In the Course of my Inquiries into this Subject, I have had an Opportunity of consulting the Journals, kept in those Voyages

" Upon the Subject of Thermometers, about which
 " you seem to be inquisitive; I must tell you, that I have
 " generally been provided with several; and, in this pre-
 " sent Voyage, have endeavoured, as much as possible, to
 " discover the Influence of Heat in the Production and
 " Course of Diseases;—for this Purpose, I ascertained,
 " with great Exactness, the Number of Men lodged upon
 " each Deck; where lodged when taken ill, and of what
 " Distemper. My Observations of the Mercury were
 " at proper stated Times, and attended with general Re-
 " marks of the Weather; notwithstanding this Exactness
 " and Attention, I cannot at this present Time settle any
 " thing satisfactory or worthy of your Notice."

by

by many ingenious Surgeons of Ships of War ; and, however irregular, or diversified under different Appearances, this Fever might shew itself, I found the Distemper was essentially the same, and that the Bark alone, judiciously administered during a Remission, or Intermission, proved the most certain Means of Cure. Many Instances might be produced, several Histories of Fevers might here be related, wherein the Efficacy of the Bark would be fully evinced. I shall only observe, that the Fever of the Island of St. Thomas, is, to a Proverb in that Part of the World, deemed the most malignant and fatal Species of any *African* or *American* Fever : But by a very accurate Account of this Fever, which I have had Occasion to peruse, it would appear, that the Bark is likewise the best Remedy.

It is again to be observed, that this Remedy proves not only a Specific for this universal malignant, remitting, or intermitting Fever, but the continued Use of it is an effectual Preservative against a Relapse. Hence one would naturally infer, that the Use of the Bark would prevent the Attack of this Sickness ; and, accordingly, Experience (the surest Guide and Standard of Medical Truths) testifies, that the Bark proves a Defence against the Attack of this Fever, and other malignant

malignant Disorders, which may be apprehended in unsalutary Climates, and during a corrupt and malignant Disposition of the Air.

— This Hint, I first received when on the Coast of *Guinea*. I was informed, that the Factories were furnished with proper Quantities of the *Cortex*, by the late *African Company*, which was taken by way of Prevention, during the rainy and sickly Season; and that it was attended with remarkable Success in such as could be brought to submit to a regular Course of Life, and to refrain from eating such Quantities of animal Food as they were wont to do in *England*, which yearly destroys many on that Coast. I have since been confirmed in my Opinion, of the Success to be expected from the Use of the Bark, taken by way of Preservative, by many Considerations and Facts: I shall produce only one of the latter.

Hungary is acknowledged to be the most sickly Climate in *Europe*, and indeed, as bad as any in the World. Here it was, where the Christian Armies, in marching only through the Country, in the Expeditions against the *Saracens*, formerly called the *Croisadoes*, often lost half of their Number, from the sickly Quality of the Country; and where the *Austrians*, not long since, buried, in a few Years,

above

above 40,000 of their best Troops, who fell a Sacrifice to the malignant Disposition of the *Hungarian Air.* — Now the same Causes, which subsist in an eminent Degree in *Hungary*, render some southern Countries injurious to the Health and Constitution of Strangers. *Hungary* abounds in Rivers, which, by often overflowing, leave that low, flat Country, overspread with Lakes and Ponds of stagnating Water, and with large, unwholesome, putrifying Marshes. So great is the Impurity of these stagnant Waters, that by them the Rivers, even the *Danube*, whose Course is slow, becomes, in Places, tainted and stinking.

The Air is moist, and, in Summer, quite sultry. In the Nights of Harvest, it was so very damp, that we are told *, the *Austrian* Soldiers could not shelter themselves from the Moisture by a triple Tent-Covering.

Epidemical Distempers begin constantly to rage in the hottest Months, which are *July*, *August*, and *September*. These Complaints, according to the accurate Observations of a

* Vide *Krameri Observationes de Climate Hungarico.*

Physician *, who practised long in *Hungary*, are altogether the same with those which are epidemic upon the Coast of *Guinea*, and in the sickly Climates of the *East* and *West Indies*, viz. malignant, remitting, and intermitting Fevers, Dysenteries, and Diarrhoeas.

The Heat of the Sun in Summer is more intense in *Hungary* (according to my Author) than in any other Part of *Europe*, and, in Proportion to the Heat, the more pestiferous are the marshy Exhalations. It is constantly observed, that the nearer any City or Fort is situated to a Morass, or an ample River, with foul and oozy Banks, the more unhealthy the Inhabitants. At such Seasons, and Places, the Air swarms with numberless Insects and Animacules, a sure Sign of its putrid and malignant Disposition.

The hotter the Summer, the more frequent and mortal the Diseases. This was fatally experienced by the *Austrians*, in the unusual sultry Summer-Months of the Year 1717, and 1718, when they found the Climate of *Hungary* a much more dreadful and destructive Enemy, than the assailing *Turks*.

* Doctor *Kramer*, Physician to the Imperial Army.

In the former of these Years, at the Siege of Belgrade, the Fever of the Country, and the Dysentery, occasioned a very singular and extraordinary Mortality among the Troops. The Dread of these Diseases caused every one (as may naturally be supposed) to have Recourse to different Precautions for Self-preservation. The great Prince *Eugene*, who commanded in Chief, had Water, and the Provisions for his Table, sent him twice a Week from Vienna. The pure Stream of the River Kahlenberg was regularly brought to him: He avoided all Excesses, and lived regularly, or rather abstemiously; refreshed himself often by eating a cool Melon, and mixed his usual Wine, which was Burgundy, with Water. But, notwithstanding his utmost Care, this illustrious Hero was seized with a dangerous Dysentery, which would have quickly terminated Life, had not the speedy Conclusion of that Campaign, permitted him a quick Retreat.*

At

* From what Kramer and others have advanced, concerning the pernicious Constitution of the Hungarian Air, we may account for the vast, and almost uniform Fatality of the variolous, and other pestilential Diseases, to which that Country is unhappily subject. A living Author (*Westpremi, de Inoculanda Peste, 1754*) a Native of Tockay, observes, that their extended Desarts and desolated Cities witness the dreadful Devastations made by

At this unhealthy Season, when hardly one Imperial Officer, much less their several Domestics, escaped those malignant Sickneses, the renowned Count *Bonneval*, and his numerous Retinue, continued, amidst this pestilential Contagion, in perfect Health, to the Surprise, or, to use my Author's Words, the Envy of all who beheld him. The only Precaution he used, was to take, two or three Times a Day, a small Quantity of Brandy, in which the Bark was infused; and he obliged all his Attendants and Domestics to follow his Example.

It is no less remarkable, that the *Count*, placing his certain Preservation in the Use of this simple Bitter, lived for many Years afterwards in the most unhealthy Spots of *Hungary*, without any Attack, or Apprehension of Disease; and continued to enjoy a perfect State of Health, during the hottest and most sickly Seasons. And thus, with an unbroken and sound Constitution, which is seldom the Case of those who reside long in such Climates, he lived to a great Age.

the malignant Evils of this Soil. A Province, says he, which requires great and annual Supplies of Colonies from fruitful *Swabia*, to reinstate those whom Disease has sacrificed.

There

There is an Instance produced by the same Author,* of a whole Regiment in *Italy* having been preserved, by the Use of the Bark, from the Attack of the same malignant Diseases, *viz.* the Dysentery and Bilious Fever (as it is often called) when the rest of the *Austrian Army*, not pursuing that Method, became greatly annoyed.

But from what has been already said, there is Reason to presume, I think with a great Degree of Certainty, that, if his Majesty's Ships, when bound on a Voyage to any of the afore-mentioned unhealthy Climates, were supplied with a due Quantity of the Bark, it might prove effectual for preventing both the Bilious Fever, and Bloody Flux, the latter being the same Disease falling upon the Intestines.

This might be made extremely palatable, by infusing it in Spirits, especially if a little Orange-Peel be added. The Orange-Flavour renders it a Bitter of an agreeable Taste, and conceals what is offensive in the Bark. Eight Ounces of Bark, and four Ounces of dried Orange-Peel, infused in a Gallon of

* Dr. Kramer.

Spirits,* will make a much more agreeable bitter Dram, than what the Sailors often make up for themselves at Sea, of Gentian, Snake-root, and other disagreeable aromatic Ingredients.—Two Ounces of this Composition, which will be but a very moderate Dram to a Sailor, may be allowed to each Man a Day, upon the Approach or Apprehension of these malignant Diseases.

It, indeed, would be still better, if the Men were to be served with only Half of this Quantity, to be taken upon an empty Stomach in the Morning, and the other Half, when they are called out, to their Night-Watch.

It does not appear, to me, necessary to subjoin any Cautions † in the Use of so excellent and

* The Spirit may be impregnated with a much greater Quantity of Bark, if needful, for a more effectual Preservation. To which I know no other Objection than that the Taste will not be so agreeable, Spirits will extract the Virtues of a triple Quantity of Bark here proposed, and thence will become much more efficacious. It is usual now in some of the Guinea Factories, when taking the Bark, to keep the Body gently lax by a Draught of Sea Water occasionally taken in a Morning. Those who dislike Spirits, may use the Bark infused in Wine, or boiled in Water.

† Where there is Apprehension of Sickness, the best Precepts are those delivered by *Celsus*, viz. To avoid

and harmless a stomachic Bitter, taken in so small a Quantity as is here directed. A whole Ounce of Bark has been swallowed, in less than two Hours, upon an empty Stomach, by Persons in Health, without their being able to perceive from it the least sensible, much less any bad Effect.* Its long continued Use is observed neither to offend the weakest hysterick Female-Constitution, nor to ruffle the most sensible and feeble System of Nerves and Solids in Men.

It may seem deviating from the Plan proposed in this short Essay, which is to state Facts, and not to frame Hypotheses, to offer any theoretic Opinions concerning the Manner, by which this *Indian Drug* produces so singular and salutary Effects. However, I

too great Fatigue, Indigestions, or Crudities in the Stomach, immoderate Cold as well as great Heat, and Excesses of every Kind: More especially, at such a Season, the Constitution is not to be weakened by Bleeding and Purging, for the Sake of Prevention. If at this Time the Stomach, or Intestines, are oppressed with Crudities, or sharp bilious Humours, these may be gently carried off by a Draught of Salt-water, or by a mild Laxative of Rhubarb, or rather by a gentle Emetic, shunning all great Evacuations of the Body as hurtful.

* Vid. Dissert. Medic. de *Cortice Peruviano*, p. 14.
Auctore, Cheney Hart.

cannot help observing, that, by what we discover of this Bark by our Senses and Experience, it is an agreeable aromatic Astringent, and one of the best stomachic Bitters. Hence, being endued with such Qualities, it must needs, like all other Bitters, strengthen the Stomach, and promote the Digestion of such hard and tenacious Food, as the *English* Sailors live upon at Sea ; and it further prevents the Generation of that gross and viscid Chyle, which is the consequent Production of that Food. Such are certainly good Purposes, which it may answer, but the more important are these : It braces the relaxed Fibres of the Body, (a relaxed Habit being the constant Effect of Heat and Moisture) and, at the same time, by keeping up a free Perspiration, and by maintaining a constant and equable Circulation of the Blood, and other Juices, it effectually prevents their Tendency to a Lenter, Stagnation, and Putrefaction.

These are well known to Physicians to be the immediate Causes, in the human Body, of the fatal intermitting, and of the putrid Distempers in hot and unwholsome Climates. We have indeed the most ample Experience of the Efficacy of this Remedy, in resisting and stopping Putrefaction. In the Small-pox, when there is a gangrenous Disposition, and in many other external Mortifications,

Mortifications, even when that deadly Process is far advanced, this Remedy gives so powerful and sudden a Check, that it appears to be the strongest Antiseptic, taken inwardly, of any yet discovered : It is, indeed, peculiarly suitable to the Constitution in hot Climates,* as also to their endemic Diseases ; and these, its divine Virtues, were known to the Native Indians, long before our Arrival among them.

But to proceed. As the Weather, remote from Land in the Torrid Zone, is, for the greatest Part of the Year, dry and serene, the excessive Heat being much moderated by a constant, refreshing, and uniform Breeze, the Men often enjoy a better State of Health at Sea, than when they arrive in Harbour, or get within Reach of the noxious Vapours, which arise from many Parts of the Land.

The particular unhealthy Seasons of the Year, the Harbours and Coasts most fatal to Europeans, are now generally known. Such Places, Prudence directs to be avoided ; but this Expedient for Health cannot always be complied with. Necessity often obliges Ships to put into Parts, where Sickness may be justly apprehended ; in order to guard against

* See the Appendix,

which,

which, as much as the Situation of Things will permit, they ought to be furnished with some other necessary Directions.

It may, in general, be remarked; that, in sultry Climates, or during hot Weather, in all Places subject to great Rains; where the Country is not cleared and cultivated, but is over-run with Thickets, Shrubs, or Woods, especially if there are Marshes, *Lagunes*, or stagnating Waters in the Neighbourhood, Sicknes may be dreaded, and such a malignant Fever of the remitting or intermitting Kind, as has been often mentioned. The Fens, even in different Counties of *England*, are known to be very dangerous to the Health of those who live near them, and still more so to Strangers; but the woody and marshy Lands in hot Countries are exceedingly more pernicious to the Health of *Europeans*.

When Ships are necessarily obliged to put into such unhealthy Parts, the first Precaution to be taken, is, to anchor at as great a Distance from the Shore as can well be done.— To prefer the open Sea, where the Anchorage is safe, to running up into Rivers or Bays inclosed with the Land, and especially where there are high Mountains, that may intercept the salutary Current of Sea Breezes. The higher

higher Ships sail up the Rivers upon the Coast of Guinea, the more sickly they become: Such, however, as keep at Sea, beyond the Reach of the Land Breeze*, are, for the most part, healthy.

It is not to be expected, that we should be able precisely to determine the Distance, to which the Sphere of unhealthy Vapours, from such woody swampy Ground, does extend itself; as this must, at all Times, greatly depend upon the blowing of the Wind from that Quarter. Thus, at *Rome*, the South-East Wind, termed, by the *Italians*, *Scirocco*, which passes over the adjacent Marshes, is most unsalutary; and yet the Effects of this Wind have been experienced to extend only to those Parts of the City, which lay nearest them, occasioning an epidemic Fever, whilst the rest of the City was free †.

That the Malignity of Air, which we are now relating, does often not extend its Influence to any considerable Distance, is farther proved by manifold Experience. “ In “ the Year 1747, when some of the *British* “ Troops, partly in Camp and Cantonments

* Two or three Leagues at Sea.

† Lancis. de nox. palud. Effluv. Lib ii. Epid. i.
Cap. 3.

" in Zealand, suffered an excessive Sickness
 " from the marshy bad Air, insomuch that
 " not a seventh Part of the Corps, stationed
 " there, was fit for Duty; Commodore
 " Mitchel's Squadron, which lay at that Time
 " at Anchor, in the Channel, between South
 " Beveland, and the Island of Walcheren, in
 " both which Places the Distemper raged,
 " was neither afflicted with Fever nor Flux,
 " but, amidst all that Sickness, enjoyed per-
 " fect Health." A Proof, says the learned
 Author *, that the moist and putrid Air of
 the Marshes was dissipated, or corrected, be-
 fore it could reach them.

How far soever the noxious Vapours, from unhealthy Grounds, may spread themselves, it is demonstrable, that their Malignity decreases in Proportion to the Distance to which they are diffused. Thus, when Commodore Long's Squadron, in the Months of July and August, 1744, lay off the Mouth of the Tiber, I observed one or two of the Ships, which lay closest to the Shore, began to be affected by the pernicious Vapour from the Land; whilst some others, lying farther out at Sea, at but a very small Distance from the former, had not a Man sick. At the same Time, the Austrian Army, under the Command of Prince

* Dr. Pringle, in his excellent Observations on the Diseases of the Army. Part I. Chap. 7.

Lobcowitz, suffered so great a Sicknes, through the Proximity of their Situation to the marshy Country, that they were obliged to decamp.

The Facts which have been recited, will, I hope, engage due Attention to one very important Direction for preserving the Health of the Men, when a Ship puts into a Harbour, where Sicknes may be apprehended from a low, marshy, uncultivated Country; which is, that the Ship be anchored in the best-aired Station, where she may be well exposed to the Sea Breezes, and, as much as possible, to the Windward of the Woods and Marshes: And the same Precautions are to be taken, when arriving at the sickly Seafon in those Climates; that is, either during, or soon after, a rainy Constitution of the Atmosphere.

The Success of Expeditions in the *East* or *West Indies*, greatly depends upon their being executed in the most proper Season of the Year; and the Ships, upon their Arrival before the Place, should, if possible, lie open to the Wind, as one of the best Preservatives against the Maladies of a neighbouring sickly Country; it having been often experienced, in those dangerous Climates, that riding safe from the Wind, in secure Creeks, and stifling close Havens, surrounded with interposing Moun-

tains, has proved the Destruction of Fleets at an Anchor, while their Cruisers at Sea have enjoyed perfect Health.

If, in such Climates, it should happen, that it is impossible to avoid anchoring close to the Land, and even in a Harbour, where the Ship is quite encompassed with Woods, Mountains, and swampy Ground, to alleviate, as much as possible, this Misfortune, some other Precautions may be taken.

The first, that I shall mention, is—That the Crew be kept at Work, upon Deck, as little as the Nature of the Service will permit, before Sun-rising, or after Sun-setting, and indeed, only when the Sea Breeze blows. This Advice is founded upon an Observation, that when the Sun is above the Horizon, the noxious Land-Vapours are more dispersed; they are then much rarer than in the Night, or even in the Evenings and Mornings, when they become denser, and more apt to affect. Add to this, that the Land-Wind vigorously conveys them in a more abundant Quantity towards the Ship. Now, the Night-Air at Land, in those southern Climates, is always very moist, occasioned by the excessive Dews; and those Dews are experienced to be extremely pernicious to such Persons, as are exposed

exposed to them *. But, although we may suppose the falling Dews to be impregnated with unfavourable Exhalations, from the Earth or Land-Air, it is nevertheless certain, that extreme Moisture greatly favours the Exertion of their unfriendly Influences.

That an impure Air has an Effect, in proportion to its Moisture, upon the Health of the Men, and even upon the most hardy Constitutions, would appear by the following curious Experiment.

In the Year 1748, upon the breaking up of the *British* Camp in *Flanders*, the Cavalry were cantoned in the unhealthy Ground about *Bois-le-duc*, and soon after were attacked with a very general Sickness, occasioned by the late Inundations of that Part of the Country. Dr. *Home*, then Surgeon to *Cope's Dra-*

* In *Arabia*, and some other Eastern Countries, the Dews are experienced to have none of those bad Qualities. But in *Guinea*, and in many Parts of the *East* and *West-Indies*, the Dews on shore have been extremely fatal to many *Europeans*; more especially when, molested with the Heat within Doors, and the Plague of Moschitoes, they have ventured to sleep in the open Night-Air. The *Negroes* and *Creoles*, sleeping without Hurt in the Dews, is a Proof how far the Constitution may be framed and accustomed to bear what otherwise is so highly prejudicial.

goons, observes *, that the Troops suffered in Proportion to their Proximity to the Marshes, and that universally, the nearer to *Bois-le-duc*, the more violent was the Distemper: The Number of the Sick, by a very accurate Observation, being found exactly to correspond with the Dampness of their Situation, and of the Air. To put this Matter beyond all Doubt, this ingenious Gentleman provided himself with a good *Hygroscope*, by which he carefully measured, every Day, the Degree of Moisture or Dryness in the Air; and, upon comparing his Tables with the Register kept of the Sick, he found, that the Progress of the Disease kept an exact Pace with the Humidity of the Air.

On the 29th of June they left the Camp, and from that Day to the 12th of July, the Air being dry, not one Soldier was affected with an Ailment. On the Evening of the 12th, the *Hygrometer* indicated a great Degree of Moisture in the Air, and that very Night the epidemic Sickness (*viz.* the remitting Fever) began among the Troops; three Dragoons of *Cope's* Regiment being seized with it. During eight Days afterwards, the Air

† In an elegant Performance, entitled, *Dissertat. Medicæ inaug. de Febre remittente*, p. 14, &c.

continued extremely moist, and the Number of the Sick was proportionally increased. The ten following Days being drier, the Number of the infected visibly diminished. But two very moist Days succeeding, the Patients were again greatly encreased. In a Word, the same Quality of the Air, which differently affected the Instrument, did also every Day, in like Manner, affect the Health of the Men. *

When a Ship at Anchor is near marshy Ground or Swamps, especially during Summer or in hot Weather, and the Wind blows directly from thence, the Gun-Ports, which would admit such a noxious Land-Breeze, ought to be kept shut. Or, if the Ship rides with her Head to the Wind, a thick Sail ought to be put upon the Fore-mast, along which, the Smoke from the Galley might be made constantly to play and ascend. If the Sail should occasion a little salutary Smoak

* Though Moisture proceeding from the Earth or Ground, is truly the most baneful, yet every Practitioner must have perceived very sensible Effects on the Constitution, from a raw, moist Atmosphere, and during rainy Weather. Thus, even in this Country, the being exposed to moist easterly Winds is very apt to produce Agues and intermitting Fevers, and especially to occasion Relapses into such Disorders.

between

between Decks, this Inconvenience will be sufficiently compensated, by its keeping off the full and straight Stream of the swampy Shore-Effluvia, which now being obliged to form a Curve before they reach the more distant Parts of the Vessel, must needs be greatly diverted and scattered. At such Seasons, the Men may be enjoined to smoke Tobacco, and the Carpenters to fumigate the Ship often with the wholesome Steams of Pitch or Tar.

'Tis constantly experienced, that the greatest Sufferers in unhealthy Harbours are the Boats Crews, and such, as being employed in the necessary Busineſs of wooding and watering the Ship, are obliged to sleep on Shore. That the Men, on these Duties, are so suddenly and universally seized with Sickneſs, is commonly ascribed to their Intemperance, or their being wet in the Night with Rain, from the Insufficiency of their Tents, &c. But the Truth is, their nearer Approach to the unwholesome Land-Air, and especially their sleeping in it, are the real Causes of their being infected. This is demonstrable from the Nature of the Malady which they contract, which is very different from the Effects of Drunkenness, or of a common Cold, and is constantly the peculiar endemic Disease of the Country. One great Means then of the Safety
of

of the Men, which are employed on Shore, would be to relieve them often, and to permit none to sleep in the Tents. Centinels should be placed with a Midshipman at the watering Place, and strictly charged to prohibit Sleep ; for in Sleep, (a State of general Relaxation) there is the greatest Danger from the unwholesome Air. This is a Thing so well known at *Rome*, that, of its many Inhabitants, there is scarce to be found one of the better Sort, who, during Summer or Autumn, would venture to sleep a Night at *Ostia*, or in the Neighbourhood of the Marshes adjoining to the City. Persons often recreate in the Day, and hunt in the unhealthy Parts of the Campania, but they are sure to return to the City before Night ; the fatal Experience of many having sufficiently taught them the Danger of sleeping in those Nurseries of Disease *.

I

* It has been an ancient received Maxim, that to rise early, was greatly conducive to Health. This, in a qualified Sense, is true. The Practice implies, Regularity the preceding Night ; and, in dry and lofty Situations, the Propriety of this Adage will the best appear. But woody, marshy, and low maritime Places, with those subject to Inundations, are manifest Exceptions to the Rule. The Inhabitants of such Districts, if they would secure themselves from febrile and other consequent Attacks of their raw and uncorrected Atmosphere, should wait the Sun's

L

Appearance

I remember in the Year 1739, when Admiral *Haddock* arrived with the Fleet under his Command in *Mahon Harbour*, a Midshipman and eight or ten Men from each Ship, were ordered to remain on Shore, with the Coopers at the Watering-Place, to refit and fill the Water-Casks. This Watering-Place was in a Creek of the Harbour, well known by the Name of *English-Cove*. Here the Men found a very large artificial Cave, dug out of a soft sandy Stone, sufficient to contain their whole Number. Their Bedding was directly carried thither, and it being in the Summer-Months, the agreeable Coolness of the Re-

Appearance in, if not his Advance above, the Horizon, before they attempt the Business of the Field. To select a domestic Instance, amidst a Variety producible on this Occasion, take that of a Clergyman of long Observation in such Matters, who has assured me, that few of the Farmers, reputed early Risers in his Parish, which is near the level Coast of *Holderness*, live to be old. Defluxions on the Breast and Lungs, Rheumatisms, Intermittents, and the Diseases of a debilitated Tone of Fibres, and slackened Perspiration, are the Evils entailed on their mistaken Conduct.

In *Europe* the Colour of the Inhabitants gives the true Indications of the Healthfulness of the Soil. Thus in most Places of the *Isle of Wight* the Natives shew in their Countenances the most visible Tokens of confirmed Health, compared with those who even inhabit the Island of *Portsea*, but especially those in the fenny Countries.

treat was deemed by them all highly refreshing. But the Consequence was, every one who slept in this damp Place, became infected with the Tertian Fever, then epidemic in *Minorca*; of which not one in eight recovered. Most of the Coopers belonging to the Fleet, were at this Time cut off by it. Whilst at the same Time, the Men on board the Ships, who lay close almost to the Shore, were free from Complaint. And others, who were ordered upon the same Duty of watering the Fleet, in the Place of those who were taken ill, enjoyed likewise a perfect State of Health, by being obliged to sleep every Night in their respective Ships. There are numerous Instances of Boats Crews having suffered greatly by sleeping near the Mangroves, with which the Sides of the Rivers are frequently planted in the Torrid Zone. I have known the whole Crew seized next Morning with bad Fevers, and seen several Men at *Hastlar* Hospital, whom the Fever, thus contracted, had left in a cachectic and irrecoverable bad State of Health.

As for those who must of necessity remain on Shore, and sleep in dangerous Desarts and uninhabited Places, some farther Directions should be added for their Use.—They must take Care not to sleep upon the Ground exposed to the Dews, but in Hammocks in a

close Tent, standing upon a dry Sand, Gravel, or Chalk near the Sea-Shore, and where there is no subterraneous Water for at least four Feet below the Surface of the Ground. The Door of this Tent should be made to open towards the Sea, and the back Part of it, which receives the Land-Breeze, must be well secured by double Canvas, or covered with Branches of Trees. When the Air is thick, moist and chill, the Earth being overspread with cold Dew, a constant Fire must be kept in or near the Tent, as the most excellent Means of purifying such unwholesome Air, and of preserving the Health of those, who either sleeping or waking, are expos'd to its Influénce. The Centinels who guard the Water-Casks, ought likewise at such a Time to have a Fire burning near them. All old and forsaken Habitations, convenient Caves, and natural Grottos in the Earth, where the Men may be induced to take up their Abode, must, before their Admission, be perfectly dried and purified with sufficient Fires; likewise every Person should be made to observe the necessary Caution of wearing warmer Cloaths and Coverings, as a Defence from the chilling nocturnal Air.

Let all, who value their Health, also have Recourse upon these Occasions, Evening and Morning,

Morning, to a Dram of the bitter Infusion of the Bark: Or, if this cannot be procured, they may use a moderate Dram of Garlic-Brandy. Exposure to the too great Heat of the Sun is carefully to be avoided.

Those Seamen or Officers who are employed on Shore in unhealthful Countries, may be allowed to indulge themselves in a more plentiful, tho' moderate Use of Vinous or Spirituous Liquors. In Ague-producing, hot, and intemperate Climates, a light Dinner, but a more hearty Supper, with a Glass in the Evening, will not be amiss, for such as have been accustomed to free living.

But Fire and Smoke being undoubtedly the great Purifiers of all unwholsome or tainted Air, and the most excellent Preservatives against its noxious Influence; I shall now endeavour to enforce the Instructions I have given relating to them by Examples and Facts.

And here I must observe, it is the Custom of the Negroes in *Guinea*, as also of some *Indians* (who both sleep for the most Part on the Ground) to have a Fire, producing a little Smoak, constantly burning in their Huts where they sleep. This not only corrects the Moisture

Moisture of the Night, but also, by occasioning more Smoke than Heat, renders the Damp from the Earth less noxious. In all those unhealthful Places, particularly during Fogs or Rains, one is sensible of a raw Vapour, disagreeable to the Smell, which arises from the Earth, and especially in the Huts and Houses; of which, however, a little Smoke is the best Corrector. On this Occasion I was favoured by the Surgeon of a *Guinea-man* with the following Relation.

The Ship being up one of the Rivers for the Sake of Trade, it was found to be very dangerous to sleep on Shore; without which, their Trade could not so conveniently be carried on. First the Captain, then the Mate, and two or three of the Seamen were taken ill; each of them the Morning after they had lain on Shore. By these Accidents the Men were greatly intimidated from lying ashore; till the Surgeon boldly offered to try the Experiment on himself, which he did: and next Morning, when he waked, he found himself seized as the rest, with a Giddiness and Pain in the Head, &c. He immediately acquainted one of the Negroes with his Condition, who carried him to his Hut, and set him down in the Smoke of it; when his Shiverings and Giddiness soon left him. He then took a Dram

Dram of the Bark Bitter; and found himself greatly relieved, especially by breathing some Time in the Smoke. Thus instructed by the Negro, he ordered a large Fire to dry the Hut he slept in; and afterwards had every Night a small Fire sufficient to raise a gentle Smoke, without occasioning a troublesome Heat: and by these Means, he, and several others, using the same Precautions, slept many Nights on Shore without any Inconvenience. The Smoke was just sufficient to destroy the Sensation of the raw damp Vapour usual in such Places.

But of all Vapours which infest the Torrid Zone, the most malignant and fatal are the *Harmattans*: And as I do not remember to have seen them any where described, I shall in this Place give the Relation I have had of them. They are said to arise from the Conflux of several Rivers in the King of *Dormeo's* Country at *Benin*; (the most unwholesome Part of *Guinea*) where Travellers are obliged to be carried on Men's Backs for several Days Journey, through swampy Grounds, and over Marshes, amidst stinking Ooze, and Thickets of Mangrove Trees, which are annually overflowed. These Vapours come up the Coast as far as *Cape Mount*, a surprizing Extent of Country, with the S. E. and N. E. Winds:

And

And it has been observed, that, in their Progress, they have often changed both the Course of the Winds, and of the Sea-currents. The Times of their Appearance at *Cape Corsa* are, the Months of *December, January or February*. The N. E. and S. E. Winds are always unhealthy, but particularly so during the *Harmattan* Season. Some Years this Vapour is scarcely perceptible, but in others it is thick, noxious, and destructive to Blacks as well as white People. The Mortality is in Proportion to the Density and Duration of the Fog. It has a raw putrid Smell, and is sometimes so thick, that a Person or House cannot be discerned through it, at the Distance of fifteen or twenty Yards; and it continues so for ten or fourteen Days; during which it opens the Seams of Ships, splits and opens the Crevices of Wood, as if shrunk or dried by a great Fire, and destroys both Man and Beast. This was the Case in the Year 1754 or 1755, (I do not now recollect which it was said to be) when this noxious stinking Fog occasioned great Mortality in *Guinea*. I have been told, that in several Negro Towns, the Living scarce sufficed to remove or bury the Dead. Twenty Women brought over from *Holland* by a new Governor, to the Castle *del Mina*, all perished, together with most of the Men in the Garrison. The Gates of *Cape Corsa* Castle were shut up for

for want of Centinels to do Duty ; at this Time the Blacks dying as well as the Whites. The only Means that could be used during this Calamity, were firing Guns in the Castle, and burning every where pitched Staves, and the like ; the Smoak of Fire always giving Relief. Several had Recourse to going on board the Ships in the Road, where the Vapour was less dense ; and by the spreading of Awnings, and kindling of Fires, a Ventilation was procured more easily on the Water than on Shore. It is lucky, that it is only in some Years that *Harmattans* are so very thick and noxious, which would otherwise depopulate Part of the Country. It is observed that all Fogs are extremely unhealthy in those Parts, particularly before and after the rainy Season ; and during those Times, the Smoak of Wood, pitched Staves, &c. are found to be the most proper Correctors of such an unhealthy Air. The *Tornado* Season is the most healthy on the *Guinea* Coast ; those Hurricanes dispelling the Vapours, and purifying the Air.

But to return from this Digression. When Sickness begins to rage with a great Mortality amongst the Men, occasioned by lying in an unhealthy Harbour ; in order to avoid the baneful Influences of the Land-Air, the

Ship must immediately put to Sea ; there to seek and regain Health, as also the perfect Recovery of the Weak and Convalescent. This Expedient has often succeeded. Here the most material Point is, to take due Care of the sick and weak that are brought on board. If they are immediately put on a gross Sea-Diet, they will soon either become cachectic and dropsical, or die in the Flux ; the latter being one of the most usual Diseases of hot Climates, as also the Consequence of most others contracted there. I have been surprised to see so many Men arrive from the *West Indies* reduced almost to Skeletons by this Malady. When a Ship puts to Sea with her Men for the Sake of Health, a proper Stock of the most light, nourishing, and restorative Food, should always be carried out for those who are sick and weak ; such as *Goats* for Food, and Milk, *portable Soup*, *Eggs* preserved by stopping up their Pores with Grease ; *Sago*, and *Salop*, *Limes* and other *Fruits*, as also *Wine*, which is at all Times greatly preferable to Spirits of any Sort, but more especially in the present Case. By such Means the Sick will recover faster at Sea than on Land.

This is the Sum of what I have to offer, as most likely to preserve the Health of the Men in his Majesty's Navy. But as it is proper to
be

be provided against the worst that can befall, it is to be observed further,—That as soon as malignant, continued, remitting or intermitting Fevers and Fluxes make their Appearance at Sea, in close, hot and moist Weather, or are contracted by the unhealthful Air of a low, woody, marshy, sickly Country; a Tendency to Putrefaction seems to be produced in the animal Humours; and at such Seasons these Diseases are almost always to be suspected as infectious, more particularly the Bloody Flux. And then it is that the frequent Mortality and the speedy Progress of such Distempers in a Ship, are, for the most Part, more owing to Contagion, than to the Influence of any other Cause; the Air being more vitiated from thence than it possibly can be by any other Means. The Cloaths, Linen, Beddings, and various Utensils of the Sick, are apt to imbibe and propagate Contagion. And the Air of the sick Apartment, when in a close unventilated Place, becomes often so highly tainted, that I have known six Attendants infected by it in less than twenty-four Hours. Hence, also, often proceeds the uncommon Malignity and Mortality occasioned by Fevers, which we sometimes hear of in Ships.—There being Instances, where a Ship's Company have suffered as much in Proportion to their Num-

ber, by a Fever having acquired a high Degree of Malignity and Contagion from polluted Air, as any well-aired City would probably suffer by a Visit from the Plague, owing to a constant *Fomes* of Infection kept up in the Ship, from the want of due Precautions.

Thus it becomes a Matter of the utmost Consequence, to put in Execution all proper Methods for early stopping the Infection, and spreading of such Diseases; if any should unfortunately occur in a Voyage, as are plainly contagious.—To deliver a few Rules for that Purpose, was the second intended Branch of this Essay, to which I shall immediately proceed, after offering some Means of Relief in an unfortunate Situation, which I have not yet mentioned.

Bad Water is, next to bad Air, a frequent Cause of Sickness, especially of the Flux, in Places situated under the Torrid Zone. But as I have elsewhere * treated on bad Waters, and the Means of rendering them more wholesome, I shall here only give the following Advices. Where the Water is bad, the Casks should always be filled with Rain, when it can be done: Or, where there is Plenty of Fuel on Shore,

the

* In my Book on the Scurvy.

the Sea Water may be distilled, which will prove as wholesome as that of the *Thames**.

If

* The Substance of a Paper read before the Royal Society, being a Letter from Dr. *Lind* to Mr. *R. H. M.*, Master of the Royal Academy at *Portsmouth*, and F.R.S.

" In revising my Essay on preserving Seamen, there
 " occurred to me a Distress usual to Mariners, which is
 " the Want of good and wholesome Water in many Parts
 " of the World at which they are obliged to remain.—
 " A Calamity not indeed peculiar to Seamen, but to
 " many of our Colonies and Factories abroad, who are
 " destitute of all other but the Rain Water. Whilst
 " in other Places, especially on the *Guinea* Coast, the
 " bad Waters of the Soil are justly suspected to occasion
 " Fluxes, the *Guinea* Worm, and various Maladies which
 " infest those Countries.

" In order to supply such Places with a pure wholesome Water, and with the least Trouble, I have long meditated an Application of the Solar Fire for distilling Sea-Water, upon the Principle, that though it was made greatly to exceed that of any Culinary or Furnace Heat, yet it would not melt any Metal so long as Water uncomressed was kept applied to its Side; and that various Contrivances might be made for retaining and diffusing it beyond the Focus of the Speculum.—As both the Glass and Still should rest upon Stands, no farther Trouble would perhaps be requisite, than a Person to attend to bring back the burning Focus to its proper Line, when altered by the Sun's Motion.—And even to save this Trouble a proper Apparatus might be thought of.

" But

If the Water, on digging a Pit in search of it, be found foul and impure, the Pit must be

" But previous to making any Trials by the Sun's Heat, I began with distilling Sea-Water, and various Ingredients, in order to fix upon such as would be least expensive, the most easy to be procured, and which would produce the purest elementary Water.

" I imagined that Sea Water distilled in Mr. *Appleby's* Way, had a soft Taste unnatural to Water. And I found upon distilling the Sea-Water from Soap-leys, Chalk, Lime, Ashes, &c. that each Ingredient communicated somewhat of its peculiar Taste and Flavour ; but in no Distillation did the Sea Salt ascend in a greater Quantity than I found by a diluted Solution of Silver in Aqua Fortis to be contained in the Rain that usually falls here, near the Sea, when the Wind comes from thence.

" Being able to draw no certain Conclusions from the Distillations I had hitherto made to what Ingredients the Preference was due for distilling Salt Water fresh, and not having the Convenience of using Glass Retorts, I ordered a small Tin Still to be made, which should contain about two Quarts of Water, to be worked without a Worm-Tube in my Study.

" After properly cleansing this Still, I drew off some of the purest Rain Water, which I reserved as the standard Taste of a new distilled Water; or of any Flavour that might be imparted by the distilling Vessels. I then put some Sea-Water by itself into the Still, which, to my great Surprize, passed into the Receiver, without having any Mixture of Bitumen or Sea Salt, and, as I judged, equal in Purity to Rain Water.

be made pretty deep and large, and its Bottom and Sides covered with large Stones, and then

“ I tried it with a Solution of Salt of Lead, but found
 “ that neither it, nor indeed any distilled Water, discovers
 “ Impurities with this Solution, which is only proper to
 “ search for a Selenites.

“ I observed that when the Still run flow, the Sea-
 “ Water then boiling gently, the Water came over freer
 “ from Sea Salt than the rain Water aforementioned.

“ I hope this Discovery will prove useful, and I am,

“ S I R,

Hafnar Hospital,
26 April, 1762.

“ Your most humble Servant,

“ James Lind.”

Having found that when Sea-Water boils, nothing ascends but a pure Vapour, which when condensed by any simple Means, is converted into an excellent pure and elementary Water; no Persons at Sea, or even when cast away upon a desert Island where there is Fuel, will now ever perish for want of fresh Water; if either they carry a Still to Sea, or can on Shore make a Contrivance for distilling simply the Sea-Water.

The common Ship-boilers, by being fitted with a Pewter Still Head, will answer all the Purposes of a Still at Sea. The Worm instead of being placed in a Tub standing upon the Deck, may be contained in a close Cavity, surrounding this Head with a Receiver, hung or slung to the Extremity of its Pipe, that it may not be affected by the Ship's Motion. The cold Sea-Water should be poured into

then a considerable Quantity of clean dry Sand and Gravel may be thrown into it. By which

into this Cavity by a Funnel fixed at the Top, with a Valve to prevent the Effect of the Ship's rolling; and when it becomes hot, may either be conveyed by a Pipe into the Still, or allowed to run off by another Pipe filled with a Stop-cock. In Case of a Scarcity of Water at Sea, what Satisfaction it must afford to be possessed of the certain Means of Exemption from insufferable Thirst, Misery, and a cruel Death?

One would indeed think that the shocking Situation and Distress to which many Seamen and Passengers have been reduced for want of that invaluable Blessing, good Water, would induce all Commanders of Ships to be at the trifling Expence of so simple a Machine as this Head for their Pot or Coppers, and which would enable them at all Times to procure wholesome Water both for themselves, their Officers, Passengers, or Sick, in Place of their usual corrupt and stinking Water at Sea. A daily Supply of Water may be also procured without any additional Waste of Fuel.

Thus, if instead of Bricks, the Fire-places of Ships had Iron Pots fixed in such a Manner, that when the Fire was at any Time lighted to dress the Victuals, the Heat would be applied to the Side of the Iron Pots constituting the Side of the Grates, and consequently the Sea-Water contained in them being put into a boiling Heat, the Vapour might be condensed by such a simple Head to the Pots as has been described. By this means, in the worst Weather at Sea when it is possible to dress Victuals, a constant Supply of fresh Water for common Drink may be obtained.

Further,

which means the Water, will often become in twenty-four Hours, clear, soft, and wholesome.

But

Further, having recollect^d that Salt Pork in Ships, is always boiled in Sea-Water; as also Salt Beef in long Cruises or Voyages ; and imagining, that if the Head of the Pots, in which those Provisions are dressed, were close and tight, those salted hard Meats might macerate and soften better, and there would be a considerable Saving of Fuel (as I found that Sea-Water boils with a less degree of Heat than fresh, and Water closely confined requires less Heat and Fuel to keep it boiling) I determined to make some Experiments on this Subject.

For this Purpose I took a Piece of Ship-salt Beef, another of salt Pork, and boiled each of them separately with Salt-Water, in a Pot with such a Still-head as hath been recommended at Sea. I was much pleased to find, that when salt Beef is boiled in Sea-Water, the condensed Vapour from the Pot (for none of it was allowed to escape) affords an excellent sweet Water, slightly tinctur^ded with the Beef Flavour.

The Water got from Pork boiled in Sea-Water, had a stronger, though not disagreeable Flavour of Pork.

When the Beef and Pork were sufficiently boiled and very fresh, the Pot was emptied, and some Ship-Peas put into it with that Water only, which had been procured from the Sea in boiling the former flesh Meats. This Water was remarkably soft, and quickly softened, broke, and boiled the Peas. In like manner I boiled some Oatmeal with the same Water which made excellent Water-gruel.

But if it still continues impure, let a small Cask, with both Ends struck out, be placed within

Now as both the Pease and Gruel were dressed in the same Pot as the Beef, with the condensing Cover, there was a Surplus of fresh Water, which originally came from the Sea, and upon standing twenty-four Hours, had neither Taste or Smell, but might serve either for a fresh boiling of Peas, or for the Use of the Hogs, Fowls, &c. in the Ship.

The whole usual Ship-provisions were thus dressed without the Use of any other but the Salt-Water, and an Overplus remained of wholesome fresh Water.

I am apt to think, that salt Beef will freshen equally well when boiled in Salt-Water as in the Fresh, provided the Water is renewed by letting the Brine occasionally run off by the Cock at the Bottom of the Copper, and supplying its Place with warm Sea-Water from the Refrigeratory.

When the Ship's Provisions are to be boiled, for saving Water in this Manner, the Pewter Head before recommended is to be used; and the Cook must be careful in keeping his Utensils very clean, and especially his Copper free from Verdigrase.—Distilled Waters become much more palatable by keeping, and that got from the Sea will keep for many Months sweet in clean Vessels or Casks.

As to the Application of the solar Heat, it must be done to Sea-Water raised to a certain and known Level, in a close Iron or Tin Tube, and to a Part of that Tube in the Form of a truncated Cone, containing a Quart

within a larger Cask wanting the Head; then into both put some clean Sand and Gravel, so that the Level of the Sand in the inner Cask (sufficient Room being left to pour in Water) be higher than the Bed of Sand in the intermediate Space betwixt the two Casks: And in the outer Cask a Cock must be fixed above the Sand there, at a Level somewhat lower than the Surface of the Materials contained in the inner Cask.

By this Contrivance, the Water poured atop of the inner or small Cask, will sink through the whole Body of Sand, &c. in it; and passing also through the Gravel and Sand in the outer Cask, will ascend, and run off at the Cock.

Quart or two, or just as much Water as it is found, upon Tryal, that the burning Glas will set and keep boiling.—But further Experiments are requisite to evince the Utility of this last Method, and to put it in Practice.

I have only to add on this Subject, that it appears by some thermometrical Observations published in the Appendix, that Sea-Water when at Rest, freezes at ten Degrees below the freezing Point of fresh Water on *Farenheit's Thermometer*. Whoever then discovers a Method of producing an artificial and constant Cold to that Degree, will be able to freeze Sea-Water, and consequently render it fresh and potable in the Cakes of Ice when thawed.

As the Surface of Sand in the inner Cask, becomes loaded with the gross Impurities of the Water, it may be removed, and fresh Sand added. Or, for private Use, the Water may be strained through a large Funnel, having its narrow Mouth filled with a Bit of Spunge, above which is to be a Layer of Sand and Gravel, covered with a piece of Flannel, and over the whole another Layer of Sand. Care must be taken to change the Sand, Spunge, &c. as often as they are found to be loaded with the Impurities of the Water. By such means, pure and wholesome Water may frequently be procured from bad Wells.

Sand and Gravel are known to be fit for the Purposes abovementioned; when Water is poured upon them in a Vessel, and after stirring with a Stick, the same Appearances follow as in moving the Bed of a pure Rivulet, *viz.* upon removing the Stick, the Particles of small Sand instantly subside, and the Water stands on their Surface without having received any Tincture.

Some toasted Biscuits put into the Water of the River *St. Laurence*, were found serviceable in preventing the bad Effects of it in occasioning Fluxes in Sir *Charles Saunders's*

ders's Fleet. About four Pounds of burnt Biscuit were used to a Hogshead of Water.

I am informed that the Troops in *Canada*, for the same Purpose, mixed powdered Ginger with the bad Water, and found Benefit thereby.

At *Senegal*, where the Water is extremely unwholesome, unquenched Lime has been used to purify it.—But Water cannot thus be purified in a Ship, because I find that it must be exposed in a very wide mouthed Vessel for many Days, and sometimes Weeks, before it loses the Taste of the Lime: much of it is also expended, by daily removing the Scum; and it will sometimes require boiling.

The Addition of a small Quantity of Vinegar is likewise very proper, as an excellent Corrector of unhealthy Water; or Cream of Tartar, as before mentioned.

I shall conclude this Section with observing, that if any of the Directions hitherto given, cannot be complied with by all the Ship's Company, on account of their Number; they may notwithstanding be useful to many, such as Officers, and all others who have proper Convenience to execute them, and are desirous
of

of preserving Health and a good Constitution, during their Residence in an unhealthy Situation, especially under the Torrid Zone.

S E C T. II.

Rules to be observed for putting a Stop to the Spreading of contagious Diseases.

A Point of great Importance, upon which the Recovery of the Afflicted, and the Preservation of the Whole, will in a great measure depend, is having a well-aired Hospital or sick Berth, as it is commonly called in Ships, appropriated for the perfect Separation of the Diseased from the Healthy ; betwixt whom no common Intercourse ought to be permitted. The Use of Ventilators must at all Times greatly contribute to the general Health of the Ship; but on this Occasion they become indispensably necessary, by affording a constant Supply of fresh Air to the Sick, and a quick Dissipation of their morbid Steams. It is true, when once a contagious or pestilential Fever has invaded the Crew, the freshest Air will not remove it ; but then proper Ventilation may abate its Malignity, lessen the Mortality, which would otherwise be occasioned, and by carrying off and dissipating the contagious Effluvia of the Sick, become a great Means

Means of preventing its further Progress.— Another very material Advantage, derived from a constant Renewal of the Air, is, that in many Instances, this will prevent common Fevers, attended with no great Degree of Contagion, from becoming highly infectious. A Danger which is always to be apprehended, when there is a great and general Sickness on Board, as in any Part of the World an Infection may be quickly generated by the Effluvia of a Number of sick People closely confined, and who are not kept properly clean in their Linen, Beds, and Utensils, especially if they labour under Fevers, Fluxes, or other putrid Diseases.

Let us but reflect, that one Man in Health pollutes a Gallon of Air in a Minute, and by breathing, renders it unfit for the Purposes of Life. This is found to be the Case, by those who dive under Water, as by various other Experiments, and evinces the absolute Necessity of its constant Renovation ; but more especially to Patients confined in Bed, as there is not any thing more refreshing, than the cool Air to the parched Lungs, or more essential to their Recovery, in every Species of Complaint*.

The

* Animals, even the most tenacious of Life, and those, whose Existence is found to depend the least on Air, sooner

The Place commonly allotted for the Sick, is either the fore Part of the Gun-Deck, called the Bay, which is the most damp and unwholesome Part of a Ship; or, what is nearly as bad, and very incommodious, the fore Part of the Hold. Both these confined Places have too often proved a Seminary of Infection to her whole Company. If the Nature of the Service would permit, whenever the Dysenteric or Tertian Fever, or other infectious Disease, more especially the malignant and petechial, or what is called the Hospital Fever, are apprehended, the most proper Place for the Sick in warm Weather, or in a hot Climate, is under the Forecastle. They might there be sufficiently defended from the Rain or Damps, by having Canvas hung round them, or a Partition made with Boards; and by this means all the Parts of the Ship below would be kept sweet, clean and wholesome. If under the Forecastle should be apprehended too noisy, or deemed improper, as the Kitchen of the Ship, or otherwise thought incommodious; it is to be recollectcd, that this Advice is proposed only to take Place on pressing Occasions, in a hot and calm Season, when no other Device can be exercised, or Opportunity

sooner expire in Air made foul, than in Vacuo. Plants sooner suffer and droop beneath the Influence of noxious Steams, than in a Want of this vivifying Fluid.

had,

had, for separating the Sound from the Infected, with equal Advantage. That it is both practicable in some Ships, and has been of Use, the following is brought as a Proof.

In the Year 1751, a Ship of twenty Guns in the *Mediterranean* was infected by a Fever, which, in the Course of four Months, attacked 70 of her Men; who were all, as is usual, subject to frequent Relapses, whilst they lay below: But upon removing the Sick under the Forecastle, the Disease soon disappeared, and in that Place they did not lose a Man.

But supposing this Place is at any time found to be inconvenient, from the Number of the Sick, or their incommoding the Working of the Ship, &c. the Patients ought then to be removed into the Gun-Room, for the Benefit of that salutary Draught of Air, which may be constantly procured them, by keeping open the Gun-Room-Ports. The Objection of the greatest Weight that can well be made against this Step, is, the Inconvenience which may arise from it to the Officers who eat and sleep in that Part. But how trifling must this Objection appear, when offered against the most proper Means of preserving their own, and many other Lives? It ought to be considered, that the Necessity of taking

this Method, will but rarely occur. Many Ships continue for Years as healthy in the *West-Indies*, as they would in *Portsmouth* Harbour, especially after being seasoning a little to that Climate.

There is seldom Occasion to remove the Sick in a Ship, from their proper Beds, into one Place; and it is done only, when their Number is increased, so as to make it inconvenient for other Men to attend them in separate Parts. Now after this Step is first taken, and a proper Berth between Decks, or in the Hold, has been provided, where the Ventilators and other Means have been used, and yet notwithstanding this, because of the daily Increase of the Sick, the Progress of the Mortality, and the plainly contagious Nature of the Disease, more Air, and a speedy Removal from an infected Berth, are found to be absolutely requisite; I believe, there are few Officers in the *English* Service, who would not willingly quit their Habitation in the Gun-Room, for the Benefit and Preservation of the Men. And this is only to be done, until they arrive in Port, and the Diseased are landed.

Let it be remembered, that if an Infection is in a Ship, Officers have no Security against it,

it, by sleeping in the Gun-Room; on the contrary, if they are permitted to have Hammocks in the *Steerage*, they are there much safer. The absolute Security of all on board does indeed entirely depend upon a Stop being put, without Delay, to the Progress of the Contagion.

'Tis further to be recollect'd, that such well-aired Places as the Gun-Room, by the Methods hereafter mentioned, are much easier cleansed from all Infection, when the Diseas'd are once removed, than the other more confined and constantly damp Parts of the Ship.

If it is still objected, that the Effluvia from the Sick would, by means of the Air entering at the Gun-Room Ports, be carried to other Parts of the Ship; I answer, there is no Danger of this, if the Place and Patients are kept sufficiently clean and neat. But effectually to prevent the least Suspicion of this Inconvenience, a perfect Separation may be made of the Gun-Room from the other Parts of the Ship, by a Partition made with Boards or painted Canvas, nailed up. If after all that has been said, the Gun-Room is not permitted for the Use of the Sick; an Hospital in the Bay is to be acquiesced in, which ought

to have Air-Holes or Scuttles cut on each Side, as also a Pipe of the Ventilator, to be played when the Weather will not permit the Air-Scuttles to be kept open.

Too much cannot well be said to conquer the Prejudices of the Ignorant, who are unacquainted with the pernicious Effects of confining Patients, labouring under a contagious Illness, in a foul stagnating Air. In such a Case, the Malignity of the Fever hourly acquires Strength from the pent-up Steams of the Diseased; and those morbid Effluvia are imbibed by all the surrounding Materials, even the Timber itself: From whence a strong Source of Infection is formed in such Apartments, constantly emitting poisonous Steams. In such a polluted Air, and tainted Apartment, the most powerful Antidotes, and febrifuge Remedies, lose their Efficacy.

The Attendants on the Sick, the Surgeon and his Mates, cannot well escape, and are often, in their Turn infected. Even those, who at first have had the good Fortune to recover, have no Security against a Relapse, their Continuance in such a tainted Air will almost certainly effect it.—More Danger is doubtless to be apprehended to the Sick, from breathing in an Air polluted with their own and the Effluvia

Effluvia of others, than from any Degree of Cold, which can well be admitted by fresh Air.

When a great Number are crowded in the Gun-Room, they will require the Ports to be open Day and Night, only it may be requisite to have Canvas Shutters, to prevent too much Cold in bad Weather. It is here taken for granted, that the Patients are duly supplied at this Time, with sufficient clean, and, if necessary, warm Bedding.

This Apartment assigned to the Sick, ought to be kept free from all Incumbrances of Chests and the like ; as also from Crowds of People. It must be washed out every Day with warm Vinegar, sprinkling the Sides of the Ship, and the Beams above the Hammocks. All possible Care must be taken during this Operation, that the Patients be not kept too close or stifled up. The Utensils of the Sick ought also to be washed or sprinkled with Vinegar, especially the necessary Buckets, when the Men are afflicted with the Dysentery. In this Case, the Buckets, immediately after using, must be washed, and afterwards have warm Vinegar poured into them.

For further Security, frequent Fumigation is also requisite, as a necessary Means for the more certain Purification or Emendation of the Air. The Fumes of camphorated Vinegar, of Nitre, of Pitch, Tar, and the like, will be found serviceable. But what I would chiefly advise, is to burn two or three Times a Day, in different Parts of the Ship, a small Quantity of wetted Gun-Powder, secured in a proper Vessel. But more of this hereafter.

What Dr. *Huxham* has recommended to several Ships, and has been found very beneficial, is a Decoction of Chamomile Flowers, Rosemary, Gum Myrrh, Roses, and Camphire in sharp Vinegar. It must be kept boiling in a proper Vessel over a Stove for the Purpose, whence it diffuses a very strong and pleasant Fume. Such Fumes or Smoke ought every Day to be renewed, and their Use continued so long as the Sicknes subsists *.

* I have lately observed again and again with Pleasure, the excellent Effects of Fumigation, when repeated and persisted in for some Time, to remove very bad infectious Fevers from the Prison-Ships in *Portsmouth Harbour*, and the *French Prison at Forton*. For it is not to be expected that once or twice fumigating will destroy an Infection in a Ship or Prison where a Number of Persons are confined and sickly.

With regard to those who are diseased, much will depend upon their being kept as clean as possible, Filthiness being a chief Source of Infection, and Cleanliness an excellent Preservative. The less cleanly may have their Hands and Feet washed with a little warm Water and Soap, or with Vinegar. When their Linen becomes foul and stiff with sweating, they ought directly to be shifted, and after fumigating such foul Linen with Smoke of Brimstone, they should be soaked in Vinegar, and washed. Dry fresh Bedding is a great Comfort to sick Persons. Every Bed, as soon as the Patient is recovered so far as to be able to get out of it, should be carried upon Deck, and there be well fumigated, aired, dried and beat by his Mess-Mate.

It is needful also that there be a Recovery-Place or Berth, into which the Convalescents are to be soon removed, taking Care that the Cloaths and Bedding be sufficiently cleaned and fumigated before their Admission into it.

This Regulation, enjoined by the Commanding Officer, ought to take Place every Day at Noon, when the Weather will permit, *viz.* That all the empty Beds in the Hospital be carried upon Deck and well aired, and if needful, smoaked and dried. Some Sailors, from

a natural slovenly Disposition, and others, when weak after Illness, are apt to be very remiss in this Point of Cleanliness, which however ought not to be in their Power to neglect. Such Beds as are observed to be quite spoiled and rotten, must be destroyed, and supplied by issuing new ones to the Men ; as ought likewise the Beds of all those who have laboured under the Dysenteric Fever, because the Bedding in this and some other Fevers, and indeed most Substances of a loose, spungy Texture, such as Wool, Feathers, &c. do strongly retain, and are apt to communicate the Contagion afresh.

The Sick are to be placed at a convenient Distance from each other, so as not to be too much crowded. Those who have Fluxes, putrid Sores, scorbutic Ulcers, and the like offensive Ailments, (which in a confined Place are sufficient of themselves to pollute the Air, and to generate a Contagion) are to be put in the best-aired Place of the Apartment ; or rather removed into a separate Place, under the Forecastle or Half-deck. Such as are under a Salivation for Venereal Diseases, are not to be admitted into the sick Apartment. Nor is this Place to be crowded with Men, labouring under any slight Complaint, or indeed any other Disease, than the reigning Epidemic one, if this

this be infectious.—Dead Bodies ought without Delay to be removed upon Deck, and the Bedding and Body-Linen of the Deceased to be thrown into the Sea. The best and sweetest Water in the Ship should always be reserved for the Use of the Sick, especially in putrid and dysenteric Cases *.

For the thorough Purification of the Ship, Fires made of dried Wood sprinkled with any resinous Substance, such as Pitch, boiled Turpentine, and the like, and moved successively into all the different Parts below, have been found very beneficial. When these Fires are brought near the Sick, the Ports must all be thrown open, as too much Heat has always been suspected of dangerous Influence in infectious Fevers; and therefore every Method is to be used, during this Operation, of keeping the Men agreeably cool in their Beds, whilst the rest are sent upon Deck.

As Wood Fires, which I had formerly † recommended, have, by late Experience in the Fleet, been found so effectual in preserving the

* For more particular Directions concerning the Treatment of the Patients on board of Ships, See Dr. Lind's Treatise on the Scurvy. Part II. Chap. 3.

† Treatise on the Scurvy, Ed. 2. p. 185.

Health of the Men, and in purifying a tainted Air, it is needful to relate their Effects. The common Observation is, that after a Ship has been for some Time in bad Weather with the Hatchways shut, the Air below, notwithstanding all the Means that can be used, is found to be close and disagreeable; doubtless from the damp Effluvia constantly emitted from all the various Contents there: But after the Purification by Wood Fires, or of burnt pitched Staves, the Heat of which goes quickly off with proper Ventilation by the Ports, Wind-Sails, &c. the Air becomes quickly much cooler than before, and continues in all the lower and unventilated Parts of the Ship sensibly fine, cool, and pleasant for some Days afterwards. Thus it would seem that Fire consumes tainted Air, and renders it cooler and fresher, after the Extinction of the Heat, by the Purification of all damp and polluted Substances.

This Observation hath been sufficiently verified by repeated Experience.

The next Things to be considered, are the Means, by which particular Persons may best defend themselves against Contagion; and it is upon this Occasion, that a Glass of the Bark-Bitter taken once or twice a Day, will be found

found an excellent Preservative against Sickness and Infection.—This may be presumed from what has been already said, and has further been confirmed by repeated Experience in like Cases. The learned Dr. *Pringle* has described, under the Denomination of the Hospital Fever, an Infection of a most virulent and high Degree ; to whom the World is greatly indebted for some excellent Observations on that, and on many other Diseases, incident in a great Measure to the Fleet, as well as to the Army. This Gentleman, by a lucky Accident, discovered the Efficacy of the Bark in this Malignant Fever. “ * Even after the Recess of the Fever, the same Medicine (*viz.* a Decoction of the Bark and Snake-Root) being continued in a smaller Quantity, not only served as a Strengthener, but likewise as a Preservative against a Relapse, whilst the Patient remained in the Hospital.” These Observations, which agree with what other Practitioners, particularly the learned Doctor *Huxham* † remarked in

* Observations on the Diseases of the Army.

† I cannot but upon this Occasion recommend to the Surgeons of the Royal Navy, the Perusal of the following excellent Books, *viz.* All the Writings of Dr. *Huxham*, particularly his Essay on Fevers, and Dr. *Pringle's* Observations on the Diseases of the Army. For the re-

in like Cases, are now added, as corroborative Proofs of the preservative Virtues of the Bark. And I further recommend it to the Trial of all Nurses and Attendants on or about the Sick at Land, for their proper Security against Infection. We often observe a Fever to run thro' a whole Family, and even the next Neighbours to become infected by it; the Precautions here directed, together with the Bark, are the best Preservatives I know *.

For perfect Security in an Affair of such Importance, where there is a strong Infection, either at Sea or Land, the Surgeons, for their own proper Preservation, must take Care never to visit the Sick when their Stomachs are empty, the Body being then in an absorbing State, nor after a full Meal of hard, and not easily digested Food. The most eligible Season is

mitting Autumnal Fever of hot Countries, they may consult *Cleghorn* on the Diseases of *Minorca*, Dr. *Grainger de febre Anomala Batava*, and likewise Dr. *Pringle's* Observations.

* At *Hastor Hospital* I have experienced a Decoction of the Bark very efficacious in preventing Relapses into infectious Fevers: But it will sometimes fail, when the Patient commits great Irregularities, or is exposed to strong infectious Causes. However, this detracts no more from its Efficacy in such Cases, than its failing sometimes to cure obstinate Agues, as is well known to Practitioners.

after

after a light Breakfast of Tea, or the like ; and a Slice of toasted Bread dipt in Vinegar, or rather the Bark-Bitter, may be taken a very little Time before entering into the Sick Chamber ; and the Mouth afterwards washed with camphorated Vinegar, swallowing a little of it with the Spittle. The Nostrils may be stopped with a little Lint dipped in the same Vinegar, which I have often used in the Hospital, in so small a Roll as not to be perceived by the Sick. A Suit of Cloaths which is reserved for the Purpose ought then to be put on. And it is to be remembered that Linen Stuffs, especially waxed ones, are preferable to woollen Materials. If convenient, at this Time the Sick-chamber should be fumigated by some purifying Steam of Tar (which is excellent) or the like Substances : The Effect of which will be, that to remove this Smoke, some Inlet of Air will be opened, by which the Chamber will become perfectly ventilated and refreshed. These Precautions being premised (all of which need only be used in Cases of the most dangerous Infection, either in a House, Ship, or Hospital) a Person may freely, and ought with great Confidence enter any infected Place, or Chamber, at the same time chewing somewhat which may occasion him to spit often, and some warm camphorated Vinegar may be held at Times

Times betwixt him and the Patient, of which he may receive the Steam ; as also dip his Finger in the Vinegar before feeling the Pulse, and afterwards, if any disagreeable Sensation remains. A Spunge is not to be used on this Occasion for wetting the Fingers, or other Purposes, at least more than once in a Place that is truly infected. After the necessary Business is performed, upon going into another Chamber, or into the fresh Air, the Mouth is again to be washed with camphorated Vinegar, the Nose-plugs removed, the Cloaths shifted, and the Hands washed. As I have often had Opportunities of visiting Patients labouring under the most contagious Diseases at *Haslar Hospital*, and never was in the least affected ; so I may venture to say, that if the above Precautions are severally used, no great Danger will arise from visiting Cases of the most pestilential Nature : But to return to the Subject of Infections in a Ship. Vinegar and Garlic, no contemptible Preservatives, should at this Time be served to the Men, by Way of Sauce for their Salt-Meats. Furnishing them also with Pipes and Tobacco, and making them smoke freely, has been a Method often practised with Success in different Ships.

It is observable, that the Perspiration and Sweat of the Patient are infectious in many Fevers,

Fevers, but above all the Stools : the Breath of a dying Person is bad, and all Fevers have been esteemed to be most contagious towards their latter End. Swallowing the Spittle in infected Places is justly deemed a Means of sooner acquiring the Taint ; upon which Account, neither the Nurses, nor any one else, should be suffered to eat in the Hospital. The Wine, before directed to be reserved for the Use of the Sick, will at such a Season be found extremely beneficial, not only as the best Medicine in certain Stages of the Fever, but as an excellent Strengthener and Preservative of the Convalescents. All spirituous Liquors moderately used, as also Lemons, are approved Prophylactics against Contagion. Wine is perhaps inferior to none of these*. If it is found inconvenient to serve the whole Ship's Company with Wine, their Allowance of Punch (made as before directed) may be increased. Or, if this cannot well be done,

* A Glaſs of Wine, with the Juice of half a Lemon, and Sugar, taken before visiting or bleeding the Sick, I also recommend as an experienced efficacious Preservative against Contagion in infected Places. It is usual with some, for preventing their swallowing Spittle, to put Tobacco in their Mouths when attending about the Diseased ; but those who are in constant Use of chewing that Plant, are apt to let down Part of its Juice with their Saliva. I would advise such Persons to use a Slice of the Root of *Calamus Aromaticus*, dipt in Vinegar, and spit often.

the Nurses ought at least to be permitted such a Quantity more than their ordinay Allowance, as may be judged reasonable to prevent their Sickness, without endangering their Abuse of it.

It will import much to the Health of all the Attendants about the Sick, that they keep both themselves and their Patients perfectly clean, and free from Filth and Nuisances ; a Rule of great Consequence in a Ship. If the Attendants on the Sick wore painted Canvas-Jackets, they would be less liable to carry about Infection, and the like Method should be taken with their Linen, as has been directed for those of the Sick. I must add, the most chearful and willing Men ought always at such Times to be preferred as Attendants on the Diseased ; Grief and Fear, being experienced greatly to dispose the Body to receive Impressions, which Mirth and Gaiety might resist. Universal Chearfulness, good Humour, and entertaining Amusements, with moderate Exercise, should be enjoined and promoted by the Officers on board. Great Fatigue of Body, Irregularities of every Sort, especially Surfeits and Drunkenness, as also long Fasting, ought carefully to be avoided, especially at such a Time as we now suppose.

It is a received Opinion, that *Fear* is a Cause of itself sufficient to produce, in certain Dispositions, a bad or malignant Fever. There are at least many Instances in besieged Towns, where no other Reason could be well assigned for the Rise of malignant Disorders, than the Dejection of Spirits, Grief, and Panic of the Inhabitants, occasioned by the Bombardment, and the Apprehensions of a violent Death from some sudden Assault of the Enemy. This much is certain, that such Passions of the Mind serve powerfully to propagate an Infection, even the Plague itself. So that on all such Occasions, too much Art cannot be used to animate, with Hope and Confidence, both the Afflicted and the Sound. Spectacles of Horror are never to be exposed to the View of sick Persons: those, therefore, who die, should be removed silently and privately out of an Hospital to a proper Place, where no idle Spectators should be permitted to view the ghastly Appearance. It is always to be remembered, that every Ceremony that is observed relating to a Corpse, makes a deep Impression on the Mind, especially of the afflicted and dispirited; and by such Impressions the Body is surprisingly affected.

If any should think that the many Precautions I have mentioned are trifling, it is for

fear they may be thought so, that they are so particularly inculcated.

Upon the first Appearance of Sicknes in an Attendant, which may be judged to have arisen from his being employed in the sick Berth, he is not immediately to be confined there, or to have his Hammock hung among the rest; as I have obſerved many Instances, where ſudden Infection, from bad Air, has gone quickly off, by Means of a gentle Vomit given without Delay, and afterwards a thorough Sweat.

It remains for me to lay down a few of the most proper Directions for purifying the Ship, and preventing the latent Seeds of a contagious Fever from breaking out again, after all the Sick, upon the Ship's Arrival at Port, are ſent away to the Hospital. These are the more needful, as Experience in Ships has ſhewn, that the getting quit of their Sick, has not always cleared them of their Infec-tion.

On the first good Day, after the Diseased are removed, together with their Cloaths, and the Gun-Powder put on Shore, Charcoal Fires, first ſufficiently kindled upon Deck, must be carried below, and there ſprinkled with Brim-stone; the Steam of which must be pretty closely confined for ſome Time. Afterwards

all

all the Bedding and Cloaths must be ordered on the Poop or Quarter-Deck, when the Ship rides with her Head to the Wind. There the Chests are to be opened, and the Bedding spread out; taking Care, that whatever is of Cotton, Wool, or Feathers, be well dried and beat, and that no Folds remain unexposed to the free Air. A gentle Breeze upon this Occasion will be serviceable. At the same Time, the Quarters of the Men below are to be washed out by Means of the Fire-Engine, if there be one on Board. This Engine, by throwing the Water with a considerable Force against the Sides of the Ship, cleanses the several small Holes and Crevices of the Timbers, much better than the Hand-Buckets.—Every Hammock in the Ship ought now to be well washed and scrubbed, as also the Men's Chests, which are often very offensive, from the Remains of rotten Cheese, mouldy Bread, and other Articles of their Provisions.

This first necessary Step of Cleanliness being premised, every Part of the Ship must afterwards be washed out with warm Vinegar. It may be done by the most lazy, indolent, and less cleanly Fellows, such as have either recovered of the Sicknes, or may be deemed liable to it from a Neglect in Point of Cleanliness: The old Cloaths of those Persons are

at this Time either to be purified with Vinegar, &c. or destroyed.

All this being duly performed, makes Way for the burning of Gun-powder. I will venture to affirm, that of the many Fumes recommended for the Emendation of the Air, and the Purification of infected Places and Substances, none are more effectual to eradicate an Infection out of a Ship, or indeed any other Place, than the confined Smoke of Gunpowder. This I affirm from Experience, without laying any Stress upon the different Materials, Sulphur, Nitre, &c. which enter into the Composition of this salutary Vapour. The Manner is this:—All the Chests, Cloaths, and Bedding of the Men, are to remain below, the Ports, Hawse-holes and Hatch-ways being kept close shut, whilst small Quantities of Gunpowder are fired in different Parts of the Hold and between Decks. A Paste may be made by thoroughly wetting the Gunpowder with Water. A small Portion of this Paste is to be thrown at a Time into the Bottom of a broad and deep Ladle, or an old Kettle or Saucepan containing live Coals, sufficiently secured by standing in a deep Bucket, or large Tub of Water. This Precaution, with that of throwing only very small Quantities at a Time of loose Powder on the wet Paste to promote

promote its taking Fire, will effectually secure against any Danger.—The Operation is to be repeated, as long as the Operators below can stand the Smoke, (which by the bye, is quite harmless to the Lungs) and, until the Hold and all the Parts between Decks, are sufficiently replete with it.—They ought to set Fire to their last Train, just as they leave the Gun-Deck in ascending the last Ladder, when the Hatchway, by which they came up, is without Delay to be shut, and, like the others, well covered over with a tight tarred Canvas Covering. The Smoke must be confined below for at least two Hours, until all the Contents of the Ship, the Timbers, Bedding, Cloaths, &c. are sufficiently penetrated and purified with this antiseptic Vapour.—The Hatch-ways are afterwards to be opened, and a Spring being put on the Cable, the Hawse-holes are to be brought to the Wind; so that by this Means, the Ship (having her Gun-Room-Ports thrown open, or whatever else will encrease the Current) may receive a full Stream of fresh and wholesome Air throughout her darkest Recesses, which ought also to be well purified, by playing of the Ventilators.

I observed I had Experience of the Efficacy of Gun-powder; and, indeed, I have known some

some sickly *Guinea Ships*, perfectly purified and rendered wholesome by the Smoke of it, when other Methods had been tried in vain. I must now add, that in all contagious Diseases and infected Places, in Hospitals or Chambers of the Sick at Land, it is a most excellent Purifier.

When the Ship is quite cleared of all its Contents, more especially if it be a new Vessel, Fires made of dry Woods, such as Pine, Fir, &c. of Herbs, such as Juniper, Rosemary, or the like, may be kindled in proper Vessels in the Hold, and occasionally besprewed with Tobacco, tarred Rope, or even Brimstone. These Fires must be kept smoaking and burning for a considerable Time in different Parts of the Ship. By these Means the most infected Vessels, Prisons, &c. may be thoroughly purified.

In so serious a Matter, indeed, too many Precautions cannot well be taken to accomplish the entire Purity of a Ship ; and this is the Reason why, in the preceding Pages, I have given a Detail of so many different Processes. When the Nature of the Service will permit it, a sickly infected Ship ought to remain at least thirty Days in Port, in order to judge of the future State of the Men's Health. None who

who have laboured under the Fever should be received on board of her, for at least fourteen Days after their perfect Recovery, as one Person, tho' seemingly well, may perhaps be the Occasion of again introducing a general Sickness.

I must add, sound healthy Ships ought to be extremely cautious upon this Head, of what Men they receive from infected Hospitals, or from sickly Ships. For want of this Precaution many have suffered. To produce one from several Instances.—I remember in the Time of the late War, upon the Arrival of a Dutch Man of War at *Spithead*, from the *West-Indies*, that two *English* Men on board of her, petitioned that they might be taken out, as being *British* Subjects, and willing to serve in the *English* Fleet. Their Request was presently granted, and accordingly they came on board one of our Ships, without having any Appearance of Sickness; but next Morning one of them was found in a Fever, and the other dead in his Bed. This Fever turned out to be highly contagious, and annoyed our Fleet for some Time afterwards.—I have mentioned this Fact, to enforce the Necessity of proper Precaution, and to evince the Importance of many Directions which have been here delivered.

When

When a Vessel is annoyed with Rats, Mice, or Insects usual in the *West-Indies*, such as Ants, Cock-Roaches, Weevils, and those of the Beetle Kind, which encrease Impurity, particularly in the most important of Articles, the Food ; the burning of Sulphur may be practised, Care being taken to extract the sulphureous Air, before the Men are permitted to go below. Another needful Caution is, that the Fire be at first gentle to draw the Rats towards it, that so they may be stifled in the Hold by the Smoke there, and not at once suffocated by a quick and violent Steam, when dying and afterwards rotting betwixt the Ship's Timbers, they are apt, for a considerable Time afterwards, to occasion a poisonous and noxious Stench.

With regard to Naval Hospitals, two Things I conceive may prove beneficial.

First, it should be ordered by a Regulation in the Navy, that when a Ship arrives from a Cruize or Voyage, having either a malignant, spotted, or dysenteric Fever, or any other Disease on board, which is plainly contagious, that, in this Case, the Captain or Surgeon should acquaint the Physician, Surgeon, or Director of the Hospital, with their Condition, previous to the Landing of the Sick, that

that proper and distinct Wards may be prepared for their Reception.—The ordinary Method has been, that as soon as the Ship is brought to an Anchor, the Sick are often sent on Shore, in the first Boats, to the Hospital, and are dispersed into the different Wards, according as the Beds are found empty, without any Information given to the Surgeon of the Nature of their Disease, till he receives the sick Ticket, which is carried along with them.

As I have hitherto endeavoured to support, by Facts, what has been advanced, so I cannot but observe, that, for want of this proposed Regulation, more than once it happened, during the late War, that a few Men, put on Shore from a foul Ship, have introduced a Contagion into an Hospital, containing a thousand Sailors.—This was the Case both at *Gibraltar* and *Mahon* Hospitals, where the Fever diffused itself so, as to endanger the Inhabitants, and especially the Garrison of the former Place. Nay more, these Hospitals became a Seminary of Contagion to the whole Fleet, as I experienced in a very healthy Ship, the *Kennington*, where, by taking on board but one recovered Man from the Hospital, the Fever was introduced among us, and

afterwards exerted its Contagion for six Months.

The other Regulation is a Consequence of the former, *viz.*—That, in all Hospitals, there should be separate Wards allotted for different Diseases. As no Man ought to be received into the Hospital, without the previous Inspection of the Surgeon, so it must be his Business to appropriate Places to each ; and in Case of the Arrival of a Ship, with a contagious Fever on board, as above-mentioned, he is then to prepare distinct Wards for the Reception of the Men ; and to use all proper Methods, for preventing the Contagion from affecting the rest of the Sick.—Many Precepts for this Purpose have been already delivered, so that I shall only say, the foul Wards in an Hospital ought always to be the best aired, and, where the Contagion is eminently malignant, spacious Tents with Fire-places, built in the Fields adjoining, are greatly preferable to any close Ward or Apartment, for dissipating Infection, and for the Recovery of the Diseased.

When a malignant Fever, in the late War, was brought from *England* into the Hospital at *Mahon*, the House being found insufficient for the Reception of so great a Number of Patients,

tients, Tents were erected in the Fields for many of the Men. These poor Men were thought to be badly accommodated, but it was very observable, that most of those, who lay in the Tents, recovered; when the Mortality in the House was so great, that in some Wards, not one in three escaped. This occurred in a hot Climate, and in Summer.

Thus I have drawn a Picture, at full Length, of the Mischiefs that may possibly flow from want of due Care and Circumspection, with a View to excite the Attention of such as might be negligent in Matters of so serious a Concern. The Province has been mine to deliver Precepts; the Power is in others to execute; and if the Expedients proposed, are thought by some, either too numerous or troublesome, let it be remembered, that to oppose the various Evils, to which our Fleets, and consequently the Safety of these Kingdoms, stand exposed, we should, with united Efforts, attempt to intercept every Reinforcement which may tend to strengthen Disease. For notwithstanding every Chance and Assistance on the Side of human Art, the unavoidable Inconveniences of Noise, Motion, crowded Numbers, and the comparative Want of Accommodations, will ever render Indis-

position aboard a much superior Calamity to similar Diseases ashore. Hence the Necessity of being, in this precautionary Tract, so circumstantial and minute.—But it is full Time to close these Scenes, and glance on what may afford a great Portion of Comfort and Encouragement.

The Seamen, on board his Majesty's Ships of War, have not only a fuller and more wholesome Diet allowed them, than in any other Service, but also an excellent Provision of the most proper Necessaries of all Sorts for the Afflicted.—Their Surgeons, in general, are now well qualified, and the Sick have at all Times a sufficient Number of careful Attendants, to administer due Assistance in their Distress. They are likewise commonly less crowded with Men, than foreign Ships of War; and in every Respect better provided with Assistance, and all the necessary Comforts in Sickness, than Merchant Ships can possibly be. Hence it is, that in Proportion to the Number of Men on board, they are often much healthier; for, from the *Guinea* and *West-India* Traders, the King's Ships have sometimes contracted their Sickness.

In the Merchant's Service, the Condition of the poor Mariner, when at Sea, is often much

much to be pitied, where he is destitute of proper Advice and Assistance, and even of such Necessaries as might afford a present momentary Relief, and render his Affliction more tolerable.—In many Cases, when in Harbour, the Men are obliged to expend a great Part of their Wages for a Cure; which, in his Majesty's Service, they might have compleated by some of the most able Physicians and Surgeons without Expence. This is an Encouragement beyond what some other Nations give; for those who are in the *French* King's Ships (if I am rightly informed) have all their Pay stopped, when in the Hospital, or under Cure.—Nor is it a small additional Pleasure to a Seaman in the Royal Navy, to reflect, that whatever Misfortunes, incident to his Way of Life, may befall him in the Service of his Country, he will be honourably rewarded, and, under many Circumstances of but small Accident, obtain a Pension for Life.

A P P E N D I X.

HAVING had Occasion already to observe, that Blood-letting, by Way of Prevention from Diseases, on passing the Tropic of Cancer, was an usual Practice at Sea*, it may not be altogether foreign to the Purpose of this Essay, to subjoin a few general Remarks on that Operation, for the Benefit of those, who never practised in the Torrid Zone. The Observations may perhaps be found the more necessary, as unxperienced Practitioners are apt to imagine the Principles they have been taught, relating to Diseases in *Europe*, may serve for invariable Rules of Practice in all other Climates.

It was before observed, that a Transition, especially if quick, from cold to extreme hot

* See Page 47.

Weather,

Weather, generally induces a plethoric Disposition. The Signs are, a Pain and Giddiness of the Head, a Heaviness and Dullness of the Eyes; sometimes the *Tunica Conjunctiva* appears slightly inflamed, there is usually a Sense of Fullness and Weight in the Breast, the Pulse feeling quick and oppressed. Some, at this Season, are seized with ardent Fevers; a few with Diarrhoeas. In such Cases, plentiful Blood-letting is plainly indicated.

But the Case is quite different, after a longer Continuance of sultry Weather, and when the Constitution is in some Measure habituated to the hot Climate. For 'tis then observed, that the Symptoms of Topical Inflammations in the Bowels, even the most dangerous, are not near so severe in such Climates, as in cold Countries; nor can the Patients bear so large Evacuations. The Practitioner, however, is not to be misled by the Mildness of the Symptoms; for he will find, notwithstanding such deceitful Appearances, that the Inflammation makes a more rapid Progress in hot Countries, than in cold; Suppurations and Mortifications being much more suddenly formed; and that, in general, all acute Distempers come sooner to a Crisis in the Southern than in colder Regions. Hence it is an important Rule of Practice in those Climates, to seize
the

the most early Opportunity in the Commencement of all threatening Inflammations, to make frequent, though not copious, Evacuations by Blood-letting. For, by Delay, the Inflammation swiftly passes from its first to its last or fatal Stage; at least an imperfect Crisis in such inflammatory Fevers ensues, which fixes an Obstruction in the Parts or Viscera, extremely difficult to remove.

It is indeed a general Maxim with some of our *English* Practitioners in the *West Indies*, that, in most acute Distempers, Bleeding in that Country is prejudicial. This is founded upon a Supposition, that the *Craffamentum* of the Blood is too much resolved, and the Solids greatly weakened by the Heat of the Climate. So, say they, when a Fever is contracted, either from an Error in the Non-naturals, or by the epidemical Constitution of the Season, Bleeding, in such a State of the Habit, by debilitating the Powers of Nature, withdraws that Strength from the Body, which is requisite to support the Patient until the Crisis is accomplished. The Reasoning is partly just; yet, like a general Maxim, will admit of many Exceptions.

First, with regard to Sailors, it is to be remembered, that they are more exposed to
S quick

quick Vicissitudes of Heat, Cold, Damps, and to various Changes of the Air and Weather, than most of the other Inhabitants in the Torrid Zone. Add to this, the Intemperance of Mariners, and the Excesses of every Kind which they are prone to fall into, whenever it is in their Power to commit them; all which render them more liable to Inflammations, than any other Set of People. Hence their Diseases require more plentiful Evacuations than the Land Inhabitants in those Parts of the World, and, generally, they bear them better.

This Rule also, as I before observed, does not take immediate Place in those, who are newly arrived in the Torrid Zone. The unaccustomed Heat not only relaxes the Fibres, especially at the Surface of the Body, but is found greatly to expand the Blood, and the other Fluids. A Proof of which, is, that young Persons are often subject, upon their first Arrival, to an Hæmorrhage from the Nose.

But with Regard to the Natives, or those who have remained long in the Country, we grant the Usage of Bleeding them but sparingly to be extremely proper, making a small Allowance for the different Seasons of the Year,

Year, the Temperature of the Air, and the Situation of the Places where they reside. Thus, in some Parts, even on the Island of *Jamaica*, and at particular Seasons, the Weather is cool; wherefore, in these Places, and at such Seasons, the Inhabitants (having their Fibres more rigid, and a more compacted Blood) bear much better the Loss of that vital Fluid.

A very different and opposite Method to that of the *English*, is pursued by the *French*, but more especially by the *Spanish* and *Portuguese* Physicians in those Countries. The former bleed too freely, and have Recourse to the Operation in almost every acute Distemper; from whence leucophlegmatic and drop-sical Diseases frequently ensue, the common and fatal Consequence of such Customs, and of profuse Evacuations in those Climates. The latter not only follow indiscriminately the Example of the former, in this Particular, but are solicitous to contrive the most cooling Remedies for all Diseases, whether acute, chronical, or what are commonly termed nervous. Whereas, in many Distempers classed under the two latter Denominations, warm, aromatic, invigorating Remedies ought, in sound Practice, to take Place, as much, if not more, in warm, than in colder Regions: And such Medicines are still more

indispensably requisite in Weaknesses and Infirmitiy succeeding acute Disorders.

In cold Countries, the State of the Air greatly assists in restoring the impaired Spring of the Fibres; whereas every thing almost in warm Weather, such as Heat, Moisture, &c. concur to relax and weaken the Habit of Body. Thus, we may daily see Persons in *Britain*, after having suffered a most severe Fit of Illness, recover their Strength and Spirits in a few Days, and, in a very short Time, their natural Constitution. But the Case is very different in the sultry Regions of the Torrid Zone, or indeed in any Part of the World whatever, where the Heat of the Season raises and sustains the Mercury for a continued Time, at the 77th Degree and upwards, of *Fabrenheit's* Thermometer. During such an Excess of Heat, Debility after Fevers is apt to remain with *European* Constitutions for several Months. In *Jamaica*, the Convalescents are sent to the cool Summits of the Mountains; but often a Retreat to a more Northern Climate is absolutely needful to recover their wonted Tone and Vigour of Body. It is an acknowledged Observation, that the *Negroes* and *Aborigines* in the Torrid Zone cannot bear too plentiful Evacuations by the Lancet.—They commonly mix the most

most stimulating, poignant Spices with their ordinary light Food, and this is experimentally found suitable to their Constitutions.

If indeed we may be allowed to assume it as a Principle, which Observation does in many Instances verify, that, in all Countries, Providence has wisely ordered a Provision of the most proper Remedies for their peculiar and endemic Diseases, we cannot here but remark, that most Part of the native medicinal Productions of the *Indies*, are of the warm aromatic Species ; such as Ginger, Contrayerva, Guajac, Winters-Bark, Pepper of many Kinds, and Spices almost of every Sort, together with Camphire, an excellent Medicine in hot Climates, and that grand Febrifuge, the *Peruvian* Bark, the most powerful Strengthener and Restorative of enfeebled, languid Constitutions, and the only Specific yet known for the malignant Diseases of those Climates.

SEVERAL Observations have been made of the different Degrees of Heat in various Latitudes, and the most accurate with *Fahrenheit's* Thermometers.

But

But I have been surprized to find how much those Instruments, though made by good Artists, differed from each other. For which Reason I have often thought that the comparative Quantities of Heat and Cold in different Places, would be best ascertained by Observations made with the same Instrument.

—I therefore sent the same Thermometer abroad with careful Persons ; and by it measured the Degrees of Heat and Cold from within 10 Degrees of the North Pole to *Jamaica*.

This Instrument has been in my Possession 14 Years ; whose erroneous printed Scale I was obliged to correct, so as to fix the Point 32, by many repeated Experiments, precisely at the Degree of Cold, in which a Tea-cup full of Water begins in 5 Minutes to freeze when the Wind is dry and northerly. And I then found that there were but 23 Degrees of Tube left before the Mercury sunk quite into the Ball : owing to a Fault of the Maker. I afterwards adjusted the Degrees ascending from 32, as nearly as I could by the boiling Water Heat of 212 Degrees ; when the Mercury in the Barometer stood in a middle Station.

According

According to this Correction of the Scale, I found 61 Degrees (that is 29 above the freezing Point) to be the usual and true Mean of agreeable warm Summer Weather in *England*, during the Months of *May* and *June*, and when a Fire in the Room was intolerable to People in Health.

54 was the usual Degree of Heat within Doors, in the warmest Days of Winter; and then I could either read or write in my Study, without a Fire: but when the Temperature of the Air was under 54, a Fire became requisite.

The lowest, in six Years Observations, I found the Mercury ever to sink at *Edinburgh*, during the severest Frosts, and when exposed all Night out of a north Window, in the open Air, was to 23 Degrees, on the 3d *February*, 1757. But in most Winters it seldom fell lower than 25 or 24 Degrees, and it was then intensely cold.

The severest Cold experienced in four Winters at *Haslar Hospital*, was on the 14th *January*, 1760. On that Day the Mercury within Doors fell to 29 Degrees: Water at this Time freezing hard when kept in the same Room.

The Instrument being placed in the open Air, that Night at 12 o'Clock, it stood at 22 Degrees; which was the lowest I ever observed. And at this Time the Sea-Water stagnating in Ponds, became covered with thin Ice.

During the Years 1758, 1759 and 1761, there was no such extraordinary Degree of Cold at *Haslar*, the greatest being 25 or 26.

At *Edinburgh*, the warmest Weather in *June*, *July*, and *August*, was commonly 70 in the Middle of the Day, and 64 in the Night. But during uncommon Heats, the Mercury has risen to 73 and 75, perhaps once or twice in a Year, and sometimes not in two Years. The greatest Heat observed by the Instrument there was on the 12th *July*, 1757, when in the Middle of the Day, and well shaded, it mounted to 80 Degrees. The Heat was then quite stifling.

At *Haslar* I found the usual Heats in Summer about 2 Degrees higher than at *Edinburgh*. The hottest Day I ever felt here was 22 *July*, 1759, when the Instrument at Noon, in the open Air, mounted to 81 Degrees, and the Temperature of my Room, with all the Windows

dows and Doors open till 10 o'Clock at Night was 75.

Many *West Indians* thought the Heat this Day as great as they had felt in the *West Indies*. At Noon there was no sitting in a Room without having all the Windows open, and a Shade from the Sun.

The same Instrument, from which those Observations were taken, was sent to *Greenland* with Mr. *Rannie*, now Surgeon of a Man of War; and in the Latitude of 80, the Mercury sunk quite into the Ball, so must have fallen to 9 Degrees, but how much below that cannot be ascertained. Now supposing it to have fallen only to 9, then the Cold in that Latitude surpassed the most severe Frost that I had observed at *Edinburgh* or *Haslar* by 13 Degrees. And as with the hardest Frost in *Great Britain*, I never saw the Mercury fall lower than 10 Degrees under the Point, at which Water freezes; there it fell 23 Degrees below it.

When the *Greenland* Ship was in more southern Latitudes, but still among the Ice; the Instrument in the great Cabbin stood at 31, and when brought upon Deck fell to 25 or 22 Degrees: which was the common Tempera-

ture of the Air during the Summer in that icy Sea, when the Sun did not shine forth.

The same Thermometer, in the Year 1752, was sent to *Jamaica* with a judicious Person, who touched at *Cork* in *Ireland*, and made the following Observations : The Instrument being placed on the outside of the Cabbin Window, and secured both from the direct and reflected Rays of the Sun.

	Degrees highest.	Lowest.	Mean or common Heat.
From <i>Cork</i> Lat. 51 : 49 20 Jan. } to Lat. 41 : 44 27 Jan. }	58	46	54
to Lat. 31 : 40 1 Feb.	64	54	59
to Lat. 21 : 40 7 Feb.	72	61	63
to Lat. 16 : 40 13 Feb.	77	67	72
Keeping in Lat. 16 : 40 to 24 Feb. when the Ship arrived at <i>Jamaica</i>	81	74	77

In *Port Royal* Harbour on the 24th of February, and for some Days following, till the Observer fell sick, the common Heat of the Day was 79 or 80 Degrees,

In the Year 1761 this Thermometer was sent in the *Stag* Man of War to the Streights of *Gibraltar*.

The lowest it ever fell there on Ship-board, during the Months of June and July, in which

which the Observations were taken, was on the 20th of June in *Gibraltar* Bay to 64; and the lowest at Land was on the 12th of June in *Gibraltar* at 73.

The highest it ever rose on the fairest Trials in the Shade, was the 4th of July, at *Oran* in *Africa*, to 86; and at *Gibraltar* on the 16th of the same Month, to 90. But the highest Degree it ever reached on board the Ship was 78.—And by several accurate Observations it appeared that the Heat at Land in *Gibraltar* exceeded that in the Ship upon the Water, by 8 or 10 Degrees; and at *Oran* by 6; and that the common Heat during Summer in the Garrison of *Gibraltar* is from 79 to 87 Degrees.

From these Accounts it appears that the Heat in *Gibraltar*, on the 16th of July, exceeded the most extraordinary Heat felt in *England* for 14 Years past, 9 Degrees;—and that the usual Summer Heat there exceeds that of *Britain* 15 or 17 Degrees.

But the highest the Mercury ever rose on the Water in *Gibraltar* Bay, in June and July, was to 78; and the common Heat on the Water in *Port Royal* Harbour in February being 79 or 80; hence the Summer Heat in *Gibraltar*

braltar Bay was not quite so much as in the Month of *February* in *Port Royal Harbour*. Tho' perhaps the Heat on Shore at *Jamaica*, in the Winter Month of *February*, was nearly equal to the Summer's Heat at *Gibraltar*.

By perusing a very exact thermometrical Diary, kept in the *Montague* Man of War, when in the *West Indies*, and adjusting the Instrument to the corrected Scale of my Thermometer, I found that from *May 24*, to *August 25*, *Anno*, 1760, the Heat in the open Gallery of that Ship had never been less than 75 Degrees, nor exceeded 88; and if we allow 6 Degrees of greater Heat at Land in *Barbadoes*, *Antigua*, *Guadalupe*, &c. where the Ship was stationed, the greatest Summer Heat in those Islands will be 94 Degrees, which approaches to within 2 Degrees of the Warmth of the vital Blood, which circulates thro' the Heart of a Man in Health.—And to this Temperature, the Water, as also all other Fluids, together with the Earth, and all the Solids, in those *West Indian Islands*, were then heated when in the Shade, viz. 62 Degrees above the Cold with which Water becomes a Solid, or is converted into Ice, and 118 Degrees below the Heat of boiling Water, exceeding the greatest Heat experienced by my Thermometer in *Britain*, for 14 Years past, by 13 Degrees.

P O S T S C R I P T.

AS some have imagined the Diseases of Seamen to be different from those who live at Land, I have here subjoined an Abstract of the Distempers of all such Mariners as have been received into *Haslar Hospital* for two Years, *viz.* from the first of July 1758, to the first of July 1760; the Number of such Patients being 5743. Of these, 2174 were afflicted with *Fevers*, 1146 with *Scurvies*, 360 with *Consumptions**, 350 with *Rheumatisms*, 245 with the *Dysentery*, and other *Fluxes* of the

* Of these 360 consumptive Patients, the Disease in one fourth of them was owing to a Cause well deserving Attention. It proceeded from Falls, Bruises, Strains, or Hurts affecting the Trunk of the Body, and which often gave no great Uneasiness for one Year, or perhaps two; and the Cause lay concealed till after Death, when in the bruised

the Belly, acute and chronical. These are by far the most frequent and fatal Diseases in the Royal Navy. Besides which, seafaring People are subject to other common Maladies. During those two Years, there were also received 10 for the *Angina*, three for the *Apoplexy*, 40 for the *Asthma*, 67 for the *Ague* or *intermit-*

bruised or hurt Part (either within or without the Cavity of the Breast) I often found large Collections of Matter in Bags; at other Times the Parts were scirrhouſe and always diseased. For a Cough, with other concomitant consumptive Symptoms, as I have discovered by Dissection, does not always argue the Mischief to lie in the Breast, but are the Signs of a weakened, drooping and wasting Habit.

Daily viewing so many piteous consumptive Objects, I have often reflected on the Barbarity of severe Cudgel-playing, Boxing and Bruising among the Vulgar; as also beating on the Trunk of the Body with a heavy Stick; where, tho' the Smart of the Blow soon ceases, a Foundation is often laid for an inward Malady, becoming mortal some Years afterwards, of which I have seen many Instances.

The Death of a Prince of amiable Memory, is said to have been owing to the violent Stroke of a Tennis-Ball; which gave no great Uneasiness for some Time after received.

Let it be remembered, that the human Machine is of too delicate a Texture, to bear rude Shocks or Bruises; and that the Injuries of its inward solid Parts are the most irreparable.

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ting Fever, 80 for Complaints of old Hurts, &c. 20 *Chachetic*, five for the *Chincough*, 10 for *Colics*, 24 for the *Dropsey*, six for *Deafness*, 30 for the *Epilepsy*, 30 for various Disorders of the *Eyes*, three for the true *Gout*, 20 for the *Gravel*, 17 for *chronic Head-achs*, 30 for *Spitting of Blood*, 10 *Hypochondriac*, 15 for the *Faundice*, 25 for *Incontinency of Urine**, 3 for the *Lethargy*, 7 for the *Lientery*, 30 for the *Leprofy*, 20 for the *Lumbago*, 14 for *Madness*, 5 for *Melancholy*, 31 for the *Measles*, 20 for the *Palsy*, 29 for the true *Peripneumony*, 11 for the true *Pleurify*, 73 for *cutaneous Diseases*, seven for the *Sciatick*, 53 for the *Small-pox*, five for the *Strangury*, 15 for the *Scrofula*, 20 for *Scalled-Heads*. There remain 680 Patients, whose Cases are not here mentioned, having been chiefly *Surgical*, *Venereal*, the *Itch*, or feigned Complaints.

* This is often a Complaint feigned by Seamen, at other Times it proceeds from Falls or Bruises.

Formulæ medicamentorum facilium pâ-
ratu, atque in morbis nauticis apprimé
utilium.

FEBRIS. Rx Sal. nitri unc. ii. tremor.
Tartari, unc. iii. M. terantur in pulverem.
Dos. drach. ss. sextâ quaque horâ. Rx Test.
ostreorum præp. (seu cretæ alb. præp.) unc. ii.
tremor. Tartari, unc. i. M. fiat pulvis. Dos.
drach. ss. sextâ quaque horâ. Rx Sal. Tartari,
unc. i. Cremor. Tartari, unc. ii. Diligenter simul
in pulverem terantur. Dos drach. ss. sæpius in
die. Rx Aquæ bordeatæ, lib. ii. cui adde pro re
nata sal. nitri drach. i. — vel oxymel. simp. unc.
i ss. — vel gum. arabici unc. ss. — vel elixir vi-
trioli acid. drach. i. — vel spir. vitrioli fort.
scrup. ss. Sit pro potu usitato. Rx Aquæ bor-
deatæ lib. ii. Cremor. Tartari drach. i. coque ad
solutionem usque Tartari, et decocto subsidentia
depurato adde syr. e succ. limonum unc. i. Sit
pro pota assiduo. Rx Aquæ puræ lib. vii. spi-
ritûs vinosi tenuioris lib. i. sacchari albi unc. iv.
M. Fiat julepum commune. Rx Julepi commun-
unc. vi. cui adde pro re nata Tartari emetic. a gr.
i. ad gr. iii. — vel vini antimon. a drach. i. ad
drach. iii. — vel spirit. nitri dulcis drach. ii. —
vel spirit. vitrioli dulcis drach. i. — vel vini
crocei unc. ss. — vel sal. nitri scrup. ii. vel sal-

diuretici drach. i. — vel moschi (cum saccharo triti) a scrup. i. ad scrup. ii. — vel sal. cornu cervi (omisso spir. vinos. ten.) scrup. i. Dos. unc. i. quartā vel sextā quaque horā. & Camphorae drach. i. mucilag. gum. Arabici drach. v. probe subigantur, Dos. gr. xxv. quartā vel sexta quaque horā. & Rob. limonum sal. Tartari (vel Absinthii) āā drach. i. aquæ puræ unc. iv. tint. cinnamomi drach. vi. syrup. simp. unc. ss. M. et addre pro re nata Mithridatii a drach. ss. ad drach. i ss. — vel elect. e scordio drach. i ss. aut drach. ii. — vel spirit. lavendulæ comp. drach. ii. — vel elixir. paregoric. drach. i ss. Dos. ab unc. i. ad unc. i ss. & Cortic. Peruviani triti unc. i. vel unc. i ss. aquæ puræ lib. iv. coquantur ad lib. i ss. injiciendo paulò ante finem cocturæ gum. Arabici drach. i. Colaturæ addè pro re nata tint. cort. Peruviani simp. lib. ss. — vel sal. nitri drach. i. — vel elixir. vitriol. acid. drach. i ss. — vel vini crocei aut tinteturæ Thebaicæ q. s. Dos. ab unc. ii. ad unc. iii. ter quaterve die.

Febris intermittens. & Cort. Peruviani pulv. unc. i. syr. e cort. aurantiorum, q. s. M. f. electarium. Adde pro re nata pulv. rhabarbari scrup. ii. — vel pulv. cort. cascarillæ unc. ss. — vel pulv. nucis moschatæ, aluminis rupei āā drach. ii. — vel sal. ammoniaci pur. drach. i. — vel rubig. chalybis præp. drach. ii. & Herb. absinthii roman. drach. iii. Cort. aurantiorum siccata. drach. i. Aquæ puræ unc. xviii. coque parum ad lib.

lib. i. Colaturæ adde pro re nata sal. Tartari
(vel sal. absinthii) scrup. iv. — vel tinct. cort.
Peruviani simp. unc. iv. — vel sal. ammoniaci
pur. scrup. ii. Dos. unc. iv. ter die.

Scorbutus. Rx Rob. limonum drach. iii.
Sacchari unc. ii. optimè commixtis adde vini albi
bispan. lib. i. Dos. ab unc. ss. ad unc. ii. quartâ
quaque horâ, quo tempore agitetur lagena ut lenis
excitetur fermentatio. Fit quoque in vicem rob.
substituendo suc. limonum unc. v. — vel suc. au-
rantiorum unc. vi. Rx Summit. pini Anglicè
diætæ hemlock pine Gallicè la prusse, sive epi-
nette blanche lib. i. optimè contusis in mortario
affunde aq. puræ tepid. lib. viii. macera in vase
clauso, subinde agitans, per 12 horas in loco te-
pido, et cola. Dos. lib. ss. mane et hora decubi-
tus, vel ad lib. ii. per diem. Rx Conserv. ab-
sinthii maritim. eleæt. lenitivi àa p. æ. elixir. vi-
triol. acid. q. s. ad acerrimum saporem. Dos.
drach. i. bis die. Rx Summit. absinthii maritim.
manipul. i. cerevisiæ tenuis cong. i. macera per
biduum pro potu assiduo. Rx Pulv. subt. cort.
Peruviani drach. ss. syr. e succo limonum. q. s. f.
bolus bis per diem sumendus.

Phthisis. Rx Spermat. ceti (cum mucilag.
gum. Arabici subact.) drach. iii. aquæ puræ unc.
vii. tinct. cinnamomi syrupi simp. àa unc. i. M.
Addre pro re nata sal. nitri drach. i. — vel lac

ammoniaci unc. ii. — vel syr. scillitici unc. ss. —
 vel elixir. paregoric. unc. ss. — vel sal. cornu.
 cervi drach. ss. Dos unc. i. sexta quaque hora.
 & Furfuris manipul. i. aquæ puræ lib. iv. co-
 quantur ad lib. ii. colaturæ adde mellis despumat.
 unc. i. M. pro potu assiduo. & Olei olivarum
 syr. balsamic. aa unc. i. mucilag. gum. Arabici
 unc. ss. M. f. Lokocho, additis non-nunquam spir-
 vitrioli tenuis gutt. xii. Detur cochleare parvu-
 lum subinde vexante ussi. & Infusi amar. simp.
 lib. ss. tinct. cort. Peruviani simp. drach. vi.
 elixir. vitrioli drach. ss. M. Dos. unc. ii. ter in
 die. & Calomel. gr. v. pulv. rhubarbari scrup.
 ss. confect. cardiac. q. s. f. bolus matutinus. &
 Aq. puræ unc. i ss. tinct. cardamomi syr. e me-
 conio aa drach. ii. tinct. thebaicæ a gutt. xx. ad
 xxx. lixiv. Tartari drach. ss. M. f. haustus
 vespertinus.

Rheumatismus Chronicus. & Saponis His-
 pan. unc. iii. mellis unc. ii. M. f. electarium.
 Adde pro re nata cinnabar. antimonii unc. i ss.—
 vel flor. sulphuris unc. i. — vel gum. guaiaci unc.
 i. — vel gum. ammoniaci drach. vi. — vel ol.
 essentia. e baccis juniperi drach. iii. — vel pulv.
 scillæ exsiccat. drach. i ss. syr. e corticib. au-
 rantior. (interdum e meconio) q. s. f. elect.
 Dos scrup. ii. bis in die. Medicamenta Varia.
 Tinct. guaiacina volatilis; a gutt. xx. ad drach.
 ii. ol. terebinthinae æther. ad gutt. lx. bis die.

Sal.

Sal prunellæ, ad drach. ss. bis die. bals. guaiacum, ad gutt. xxx. bis die. vin. antimoniale, a gutt. xii. ad drach. i ss. Tartarum emeticum ad gran. ss. ter in die. Antimonium præp. ad drach. ss. bis die. Ol. essential. e seminib. anisi, ad gutt. xl. Aq. calcis simp. ad lib. i. per diem. Aqua picea, ad unc. iv. ter in die. Sem. sinapi integra, ad cochleare unum sive unc. ss. bis de die. Psy- chrolusia, seu immersio in aqua marina.

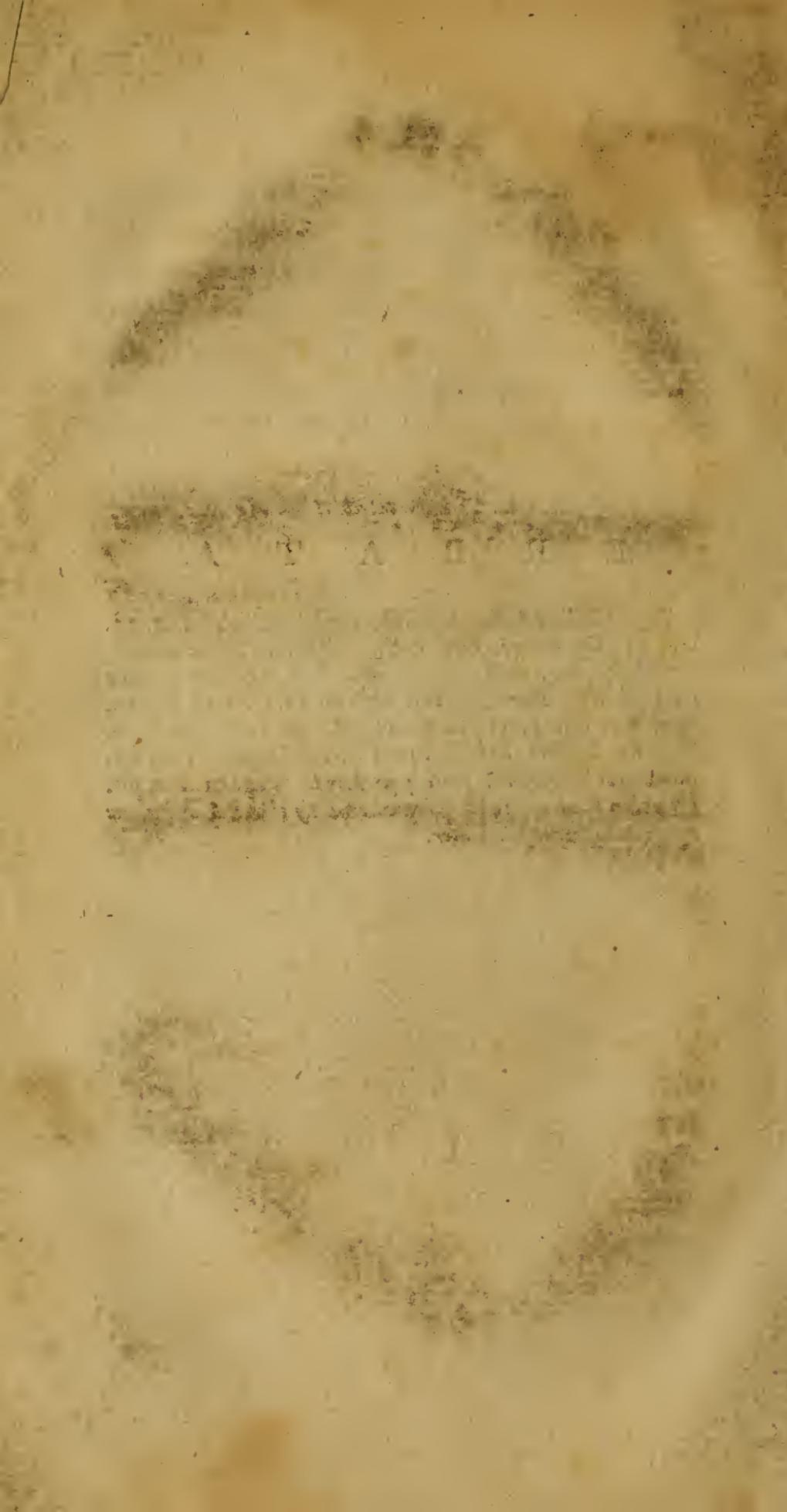
Diarrhœa Dysenteria. Pulv. ipecacuanhæ, a gr. v. ad scrup. i. — Rad. rhabarbari, a gr. x. ad drach. i. — Vitr. antimonii cerat. gr. v. — Calomel, gr. v. — Pilulæ saponaceæ, a gr. v. ad scrup. ss. & Elect. e scordio drach. ss. f. bolus addantur pro re nata pulv. rhabarbari drach. ss. — vel rhabarbari. terrefact. gr. xv. — vel pulv. ipecacuanh. gr. i. M. & Spec. e scordio sine opio scrup. ss. Philon. Lond. gr. vii. syr. e meconio, q. s. f. Bolus post singulas sedes repetendus. & Capit. papaver. alb. contus. unc. ss. cort. Peruviani trit. unc. i ss. aquæ puræ lib. iv. coque ad lib. ii. sub finem injiciendo gum. Arabici cinnamomi aa drach. i. colaturæ fortiter expressæ detur unc. i. omni biborio, additis si res postulat elixir. paregor. guttis aliquot. & Aq. bordeat. unc. vi. vel iv. mucilag. gum Arabici unc. ss. vel drach. ii. M. f. enema. Adde pro re nata tinct. thebaic. gutt. xl. — vel elect. e scordio drach. ii. — vel vini rubri unc. ii. — vel decoct. Peruvian.

Peruvian. modo præscrip. unc. ii. & Cort. quer-
cus drach. vi. coq. ex aq. pur. lib. iii. ad lib. ii.
injiciendo sub finem coctionis flor. rosarum rubr.
drach. ii. colaturæ adde tinct. cinnamomi unc. ii.
tinct. japonicae unc. i. detur lib. i. per diem. & Aq.
calcis simp. lib. i. syr. balsamic. (vel e meconio)
unc. i. M. Dos. unc. ii. aut iii. ter die.

Colica Pictorum, Anglice dry belly-ach.
& Pulv. ipecacuanhæ gr. xii. Tartari emetic.
gr. i. M. f. pulvis emeticus si opus sit, interdum
exhibendus. & Rob. limonum, sal. absinthii āā
scrup. i. aq. menthæ spirit. unc. i ss. opii puri
gr. i. vel gr. i ss. syr. e meconio drach. i. M. S.
A. f. Haustus pro re nata sumendus. & Ex-
tracti cathartici gr. xv. vel drach. ss. calomel.
gr. x. opii puri gr. i ss. saponis alb. gr. vi. ol.
effent. menthæ vulg. gutt. ii. syr. e corticib. au-
rantior. q. s. Cogantur in massam pilularem S. A.
in pilulas gr. vi. dividendam pro dosi una. &
Infusi senæ commun. unc. iii. tinct. senæ drach.
iii. olei olivarum opt. unc. ss. syr. e meconio
drach. ii. M. f. potio purgans. Detur unc. i.
quoque biborio, post exhibitionem pilular. modo
præscript. utatur æger semicupio. & Capit.
papaveris alb. drach. iii. aq. puræ lib. i
ss. coq. ad unc. x. injiciendo sub finem coc-
turæ flor. chamæmeli drach. ii. Colaturæ fortiter
expressæ adde ol. olivarum unc. ii. saponis alb. unc.
ss. M. f. enema. & Calomel. gr. i. camphoræ.
gr. vi. Bals. Peruviani q. s. f. pilulæ duæ bis in
die repetendæ.

E R R A T A.

Page 28. line 8. for *principle*, read *principal*. Pag. 35. line 11. for *where*, read *when*. Pag. 45. line penult. for *Madegascar*, read *Madagascar*. Pag. 65. line 21. for *it*, read *its*. Pag. 74. line ult. for *Porea*, read *Portsea*. Pag. 80. line 4. et ult. for *Cape Corsa*, read *Cape Corso*. Pag. 85. for *Mr. Robinson*, read *Mr. Robertson*. Pag. 88. line 6. for *pipe filled*, read *pipe fitted*. Pag. 91. line ult. for *when thawed*, read *when alternately thawed, and froze again in different sea-water*.



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