

# BLANE GILBERT

OBSERVATIONS ON THE  
DISEASES OF SEAMEN

**Gilbert Blane**  
**Observations on the**  
**Diseases of Seamen**

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*Observations on the Diseases of Seamen:*

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# **Observations on the Diseases of Seamen**

**DEDICATION**

**TO HIS**

**ROYAL HIGHNESS**

**Prince WILLIAM-HENRY**

**SIR,**

The following Work is the fruit of several years labour employed in the Public Service, chiefly under that great and successful Admiral, Lord Rodney, in a series of Naval Operations, which have been productive of events more glorious than any recorded in the Annals of Britain. As your Royal Highness was present during some part of the service which is the

subject of these Observations, and as You have not only honoured the Sea Service by embracing it as a profession, and enrolling your illustrious Name among its officers, but in undergoing the dangers and fatigues of actual service, which is so necessary to attain that practical Skill which Your Royal Highness is well known to possess, I have, upon these grounds, presumed to lay this Work at Your feet. I should do this with greater satisfaction, were it more worthy of Your acceptance; but however inadequate my abilities may have been to the talk, it has been my sincere aim to produce a work of some utility to that only Bulwark of our Country, the British Navy, of which your Royal Highness is the Pride and the Hope.

Your Royal Highness's Permission to inscribe this work to You, and the personal Notice and Protection with which you have been pleased to honour me, I consider as the first Distinctions of my life, and of which I shall ever entertain a becoming sense, by cherishing those indelible sentiments of Respect, Gratitude, and Attachment, which are due to Your Royal Highness from

Your Royal Highness's  
Most faithful,  
Most obedient, and  
Most devoted Servant,  
GILBERT BLANE.

London,  
May 1, 1785.

# PREFACE

Having been appointed by Lord Rodney Physician to the Fleet under his command, in the beginning of the year 1780, I determined to avail myself, to the utmost of my abilities, of the advantages which this field of observation afforded. This I was led to do, in order to satisfy my own mind as a matter of duty, as well as to find out, if possible, the means of bettering the condition of a class of men, who are the bulwark of the state, but whose lot is hardship and disease, above that of all others.

A fleet, consisting seldom of less than twenty ships of the line of battle, and sometimes exceeding forty, which I attended in the different scenes of active service in that distant and unhealthy region, for more than three years, has afforded me opportunities of making observations upon a large scale.

My object has been prevention as much as cure; and as the former must more particularly depend on a knowledge of the external causes of disease, I have collected and arranged all the facts upon this subject that came within my reach, considering these as the only grounds from whence the remote causes of health and sickness could be deduced.

When I entered upon my employment, the Commander in Chief gave an order, that every surgeon in the fleet should send me a monthly return, stating the degree of prevalence of different diseases, the mortality, and whatever else related to the health

of the respective ships. This was done with a view to enable me to regulate the reception of men into hospitals, so that each ship might have a due proportion of relief, according to the degree of sickness on board, taking care at the same time that the hospitals should not be overcrowded; and also to acquaint the Commander in Chief, from time to time, of the state of sickness, or the predominance of particular diseases, in order to recommend such articles of diet, or other means, as might tend to cure them, or to check their progress. These returns have served also in this work as a method of collecting a multitude of well-established facts, tending to ascertain the causes and course of disease.

While the fleet was in port, I also superintended and visited daily the hospitals, of which there is one at almost every island on the station; and having kept an account of the different kinds of disease that were admitted, and of their mortality, I have in this way likewise been furnished with a number of facts that may throw light on the history of human maladies.

Nevertheless, I do not boast of having made great discoveries; and every person of a correct judgement must be aware how difficult it is to ascertain truths, and to draw fair and solid inferences, on medical subjects. I have attempted little more than to amass, from my own observation, and by the assistance of the surgeons of the fleet, a number of well-established facts, and to arrange them in such a methodical manner, as to prove a groundwork for investigation; and I am persuaded that others,

of more sagacity and enlarged knowledge than myself, may be able to deduce from them, observations that may have escaped me especially if these new, but imperfect, attempts should come to be compared with similar ones that may be made by other observers in other climates, and in other circumstances of service.

I met with several obstacles in instituting inquiries, purely medical, to the extent I could have wished. There is, in the first place, from the nature of the subject, a great difficulty attending all practical inquiries in medicine; for, in order to ascertain truth, in a manner that is satisfactory to a mind habituated to chaste investigation, there must be a series of patient and attentive observations upon a great number of cases, and the different trials must be varied, weighed, and compared, in order to form a proper estimate of the real efficacy of different remedies and modes of treatment.

But besides this difficulty belonging to the nature of the subject, there were others connected with the nature of the service; for the hospitals were at times so inadequate in point of size, and so ill provided with necessary articles and accommodations, particularly during the first part of my attendance, that my principal care was to remedy these defects by proper superintendence and representation.

A due attention to air, diet, and cleanliness, is not only more essential than mere medical treatment, but the sick cannot be considered as fit subjects for evincing the powers of medicine

till they are properly provided for in these respects. These inconveniences were owing, in a great measure, to the unusual extent of the service; for there was a much greater naval force in those seas, at this period, than was ever before known, and there was of course a proportional want of accommodation for the sick. Towards the end of the war these difficulties were much obviated, so that a fairer field of observation presented itself.

Another obstacle to my practical inquiries was, that the fleets I belonged to seldom remained more than six weeks or two months at any one place, so that any series of observations that might have been instituted was interrupted, and I was in a great degree deprived of the fruits of them, by not seeing the event of cases under my management.

The peace in the spring of the year 1783 put an end to all my inquiries, and particularly prevented me from following out some practical researches. I have ventured, however, in one part of this work, to give the result of my experience in some diseases, more especially such as are peculiar to the climate and mode of life.

Upon the whole, I have, in the following work, humbly attempted to follow what I conceive to be the only true method of cultivating any practical art, that is, to collect and compare a great number of facts. A few individual cases are not to be relied on as a foundation of general reasoning, the deductions from them being inconclusive and fallacious, and they are liable to be turned and glossed, according as the mind of the observer may be biassed by a favourite prepossession or hypothesis. It has been my study

to exhibit a rigid transcript of truth and nature upon a large scale, and to take the average of numberless particular facts, to serve as a groundwork for observation; and I have endeavoured to analyse and collate these facts, by throwing the monthly returns that were made to me into the form of Tables, as the most certain and compendious way for finding their general result. If the materials are not sufficiently ample, or if the method should be found faulty and imperfect, let it be remembered, that I had no example to go by in this field of observation. It is to be regretted, that ages have passed without any attempts being made to transmit regular records of this kind to posterity. It would not only be extremely curious, as a piece of natural knowledge, but would conduce greatly to medical improvement and public utility, were we possessed of such information concerning the causes and nature of the diseases prevailing at sea, in various circumstances of weather, climate, and diet, in remote ages and countries, or even in our own age and country, as might enable us to compare them with present facts, and to ascertain more precisely the means of preventing and removing such diseases.

The favourable reception which the first edition of this work has met with, renders it necessary to offer another to the Public; and though no new opportunities have occurred of making additional observations in the naval service I have endeavoured, during the last two years, from a pretty extensive experience in a large hospital, and from private practice, to add some new information on some practical points; and I hope this edition will

be found throughout more full and correct than the former.

The method I propose to follow in this work, is, First, to deliver the history of the different voyages and expeditions, so far as relates to health, giving an account of the prevalence and nature of the diseases and mortality on board of ships and in hospitals.

Secondly, To deduce, from observations founded on these facts, and also from the former experience of others, the causes of sickness in fleets, and the means of prevention.

Thirdly, To deliver some practical observations on the cure of the most common diseases incident to fleets, particularly in hot climates.

# PART I

## BOOK I

Comprehending the Medical History of the Fleet, from March, 1780, till August, 1781.

### CHAP. I

Containing an Account of the Health of the Fleet from March, 1780, till July following. – Five Ships of the Line arrive at Barbadoes from Europe in March – Join a large Squadron then on that Station – Their Health compared – Engagements with the Enemy in April and May producing Hardship and Exposure, but little Increase of Sickness – Method of collecting the Returns of the Surgeons – Influence of Situation upon Health in Harbours – Course of the Seasons, and Temperature of the West Indies – The Fleet reinforced in June and July with Ships from England and North America – Their Health.

During the war, which broke out with France in 1778, and with Spain in 1779, the West Indies was the principal seat of naval operations, and much greater fleets were then employed in that quarter of the world than in any former period.

Though there had been a great squadron on the Caribbee station during the greater part of 1779, no physician was appointed to it till the beginning of the next year, when I arrived there in that character with my friend and protector, Lord Rodney.

There were then sixteen ships of the line on that station, most of which had been upwards of twelve months in the climate; and they were reinforced at this time by five more from England.

The squadron which we found on the station was then extremely healthy, and in several of the ships there was not a man unfit for duty. We were told, however, that they had all been subject to sickness, particularly to the dysentery, soon after their arrival in that climate. Of the five with which the fleet was at this time reinforced, all but the Intrepid left England at Christmas, making part of the squadron which effected the first relief of Gibraltar, under the command of Lord Rodney, who continued his route to the West Indies, in order to take the command on the Windward station, where he arrived on the 16th of March. The Intrepid had arrived with a convoy the day before. These five ships were all pretty healthy on their passage, except the Sandwich and Terrible, in which a fever prevailed; but they had almost recovered from it before they arrived in the West Indies. A dysentery broke out in April in all the ships newly arrived, and it prevailed to the greatest degree in those which had been most affected with fevers in Europe, namely, in the Terrible and Intrepid. The Sandwich and Ajax were also affected,

though in a less degree; but the Montagu, though this was her first voyage, and though she was just off the stocks, had been the most healthy of any of them from the time of leaving England, and continued so during all this campaign. I have not observed that new ships are more unhealthy than others, unless they are built of ill-seasoned timber; and they have this advantage, that there is no previous infection adhering to them. What may have contributed also to the superior health of the Montagu, was the precaution that was taken when this ship was first manned and fitted out, of stripping and washing the men that were brought from the guardship to complete the crew.

The Intrepid, while in England, had been afflicted with fevers to a most uncommon degree; for, being one of the fleet in the Channel cruise the year before, almost the whole crew either died at sea, or were sent to the hospital upon arriving at Portsmouth. This ship, after refitting, was pretty healthy for a little time; but, probably from the operation of the old adhering infection, she became extremely sickly immediately after joining our fleet, and sent two hundred men to the hospital the first two months after arriving in the West Indies. Most of these were ill of the dysentery.

The Pegasus frigate arrived with the ships from Gibraltar, and we have here an instance of the superior health commonly enjoyed by this class of ships over ships of the line; for when she was dispatched to England in the end of April, there had not been a man taken ill from the time of her arrival on the station.

This season was a very active one in the operations of war; for, besides the general battle of the 17th of April, there were two partial actions in May; and, from the 15th of the former month till the 20th of the latter, our fleet was constantly in the face of the enemy's, except for a few days that it was refitting at St. Lucia after the first battle. This was extremely harrassing to the men, not only from the incessant labour necessary in the evolutions of the fleet, but by their being constantly at quarters with the ships clear for action; for, in that situation, they had nothing to sleep upon but the bare decks, the hammocks and bedding being removed from between decks, where they might embarrass the men in fighting, and they become useful on the quarter deck, by serving to barricade the ship, which is done by placing them in ranges on the gunwale, to cover the men from the enemy's grape and small shot. These hardships were productive of some sickness, though much less than might have been expected; for the weather is at all times warm, and it was at this time extremely moderate and dry. Besides we shall see in other instances as well as this, that, in the ardour inspired by the presence of an enemy, men are less exhausted by their exertions than on ordinary and less interesting occasions.

Almost the whole of the sick and wounded, to the number of 750, were put on shore at Barbadoes, where all the fleet, except three ships<sup>1</sup>, arrived on the 22d of May.

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<sup>1</sup> These were the Conqueror, the Cornwall, and the Boyne, which were so damaged in the battles, that they were obliged to bear away for St. Lucia.

I now began to keep regular and methodical accounts of the sickness and mortality in the fleet, though in a manner more imperfect and less accurate than was afterwards adopted. I was embarked on board of the Sandwich, where the Commander in Chief had his flag, so that I was always present with the main body of the fleet, whether at sea or in port.

A form of monthly returns<sup>2</sup> was adopted, which, as well as other points of method, was afterwards improved.

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<sup>2</sup> The following may serve as a specimen of these returns: State of Health of His Majesty's Ship Alcide. Carlisle Bay, Barbadoes, 1st June, 1781. REMARKS During the course of last month we had one hundred and fourteen of the men, who contracted the scurvy in the late long cruise, recovered by the use of limes, which were procured at Montserrat. A pint of wine, with an equal quantity of water, made agreeable with sugar and tamarinds, is served to each patient daily. The regimen is exactly the same as mentioned last month. Since we came into port, very few have been seized with scurvy, but several complain daily of fluxes and feverish complaints, none of which seem at present to be of any consequence. Four patients have last month complained of an almost total blindness towards evening, accompanied with head-ach, vertigo, nausea, and a sense of weight about the precordia. The pupil is then extremely dilated, but contracts readily when a strong light is presented to it. Two of them had the scurvy in a high degree, one of them slightly, and the other seemed entirely free from it. I am not well acquainted with the nature or cure of this disease, which I believe is called Nyctalopia by some systematic writers. I gave those who were affected with it an emetic, which brought up a great deal of bile, and relieved the symptoms both of the head and stomach. This encouraged me to a repetition of it, which seemed also to be attended with benefit. I likewise applied blisters behind the ears, and gave bark and elixir of vitriol, with the antiscorbutic course, to those that required it. I can form no probable conjecture concerning the cause of this disease. I have observed a dilation of the pupil in scorbutic patients, and they complained of a cloud before their eyes, with imperfect vision, which disappeared as the scurvy went off. WILLIAM TELFORD. To Dr. Blane, Physician to the Fleet.

After collecting the returns for each month, I made abstracts of them in tables; in one column of which the complement of each ship is set down, in order to form calculations of the comparative prevalence and mortality of different diseases at different times. One of the abstracts is here inserted, ([Table I.](#)) by way of specimen, and the proportional result of them for fourteen months is set down in another table, ([Table II.](#))

Though this last exhibits a tolerably just view, yet it may be remarked, as one imperfection, that there was no distinction made at this time in my returns between the killed and those who died of disease; so that in the month of May, which stands first, the proportion is too high; for there were sixty-four killed, and two hundred wounded, in the two actions of that month.

## **TABLE I**

### **ABSTRACT of RETURNS,**

**1st June, 1781**

Transcriber's keys:

A Complement.

B Sick and Wounded on Board.

C Sent to the Hospital in the course of last Month.

D Dead on Board in the course of last Month.

SHIPS' NAMES.	A	B	C	D
Sandwich	732	28	36	2
Barfleur	767	133	22	1
Gibraltar	650	67	88	10
Triumph	650	7	9	2
Centaur	650	45	26	5
Torbay	600	31	57	5
Monarch	600	62	14	2
Terrible	600	85	24	1
Alfred	600	57	38	1
Russel	600	44	134	7
Alcide	600	42	35	1
Shrewsbury	600	30	23	5
Invincible	600	50	63	9
Resolution	600	107	54	3
Ajax	550	20	10	2
Princessa	560	88	40	5
Belliqueux	500	19	0	1
Prince William	500	25	14	2
Panther	420	16	6	0
Triton	200	5	1	0
Hyena	200	11	0	0
Cyclops	200	5	2	0
Total	11979	977	696	64

The main body of the fleet lay at Barbadoes till the 6th of June, and the men had recruited extremely by their stay there; for vegetables, fruit, and other refreshments, can be procured at

an easier rate, and in much greater plenty, at this island, than any other on the station.

The fleet arrived at St. Lucia the next day after it sailed from Barbadoes, and remained there till the 18th of June. The whole of this month was showery at this island, though it is not accounted the common rainy season; for more rain falls here than at any of the other islands at that time in our possession, being the most mountainous, as well as the most woody and uncultivated, of them all. These rains produced some increase of sickness, but very little, when compared to what took place at the same time in the army on shore, and in the ships refitting at the Carenage. There died about this time from fifty to fifty-five men every week in an army of not quite two thousand men.

The difference in point of health between the Carenage (which, as the word implies, is the place where ships go to be hove down, or otherwise repaired) and Gros-Islet Bay, where the main body of the fleet lay, affords a striking proof of the effects of situation. The Carenage is a land-locked creek, with a marsh adjacent to it, whereas the other is a road open to the fine air of the sea, the only land sheltering it to windward being a small, dry island, consisting of one hill, of half a league in circumference, and some of the cliffs of the main island of St. Lucia.

The increase of sickness here was farther prevented by the men having little labour to perform on shore, nor any haunts to encourage intemperance, a vice which the Admiral endeavoured still more effectually to prevent, by ordering all the rum stills in

the neighbourhood to be destroyed.

It may be proper here to introduce a general account of the seasons and temperature of the West Indies, as there will be frequent occasion hereafter to make allusions to them. With regard to the heat, though the range of the temperature is very small, in comparison of what it is in Europe, the variations follow the same seasons; for July and August are the hottest months, and December and January the coolest. This we would naturally expect, as our plantations lie all in the northern hemisphere, between the 10th and 20th degree of N. latitude, and therefore bear the same relation as Europe does to the sun's annual course. The hurricanes happen in the same season in which the periodical rains chiefly fall, that is, in the months of August, September, and October, which are called the hurricane months, and this is also the most unhealthy season. The time of the year which is most apt to be rainy, next to this, is from the middle of May to the middle or end of June, but this is not invariable. The lowest I ever observed the thermometer was at  $69^{\circ}$ ; it stands very commonly at  $72^{\circ}$  at sunrise, in the cool season, rising to  $78^{\circ}$  or  $79^{\circ}$  in the middle of the day. In the hot season, the common range is from  $76^{\circ}$  to  $83^{\circ}$ . It seldom exceeds this in the shade at sea; and the greatest height at which I ever observed it in the shade at land was  $87^{\circ}$ . This is far short of the extremes of heat which they experience at certain seasons on the continent of North America, even very far north. In Pennsylvania and New York, the thermometer, I have been assured, rises frequently above  $90^{\circ}$ . It

does so commonly enough in the East Indies; but I believe it never was known to rise so high in the West Indies, so that the heat, comparatively speaking, may be called moderate and steady.

The comparative mortality in June is small, owing to the fleet's having been cleared of all the bad cases at Barbadoes before it sailed from thence. Though the proportion of sick in July is less, that of the mortality is greater, (see [Table II.](#)) which seems to be owing to this circumstance, that the cases taken ill during the rainy weather of June did not terminate fatally till the succeeding month.

In the course of this summer the fleet was reinforced by several ships of the line from England. The *Triumph* arrived in May, without any sick on board; but a flux prevailed a few weeks afterwards, without any evident cause, except the influence of the climate, and the exposure and fatigues during the operations of May. The disease, however, soon subsided, and the ship being kept in excellent order and discipline, continued healthy during all the remaining time in which she served with us.

In June, the *Russel*, of 74 guns, arrived from North America, and the *Shrewsbury*, a ship of the same rate, from England. The former left England in 1778, but was obliged to put back by stress of weather and sickness, and upon arriving afterwards on the coast of America, was extremely afflicted both with fevers and the scurvy. These were removed to the hospital, and this ship had become free of all sickness before sailing for the West Indies, except that a few of the men were seized with fevers, and

she remained healthy after arriving there, not suffering from any regular attack of sickness, such as affected the ships in general from Europe. The Shrewsbury left England healthy, but was soon attacked with a fever and flux, which continued to prevail till the end of the year.

The fever in these two ships resembled rather the low ship fever of Europe than the bilious one peculiar to the climate. This last, indeed, seldom or never prevails to a great degree on board of a ship, unless it has been caught on the watering duty, or from some other exposure to the air of the land. I have, however, known a few instances of bilious fevers in men who never had been on shore from the time they left England; I have even known men of the same description attacked with intermittent fevers, which are supposed to depend still more on land air. This is perhaps owing either to the quantity of water in a great ship, part of which is always more or less putrid, or to the fresh-cut wood of the country taken on board for fuel, the steam of all which must resemble a good deal the effluvia of woods and marshes, which are supposed to give rise to intermittents.

In the beginning of July our fleet was reinforced with the Culloden, Egmont, and Centaur, all of 74 guns. In the end of the same month we were joined by the Alcide and Torbay, of the same rate, and also directly from England. The fleet was at this time at St. Christopher's, having arrived there on the 22d of the month, with a large convoy from England, which had joined it at St. Lucia, under protection of the Thunderer and Berwick, two

ships of the line, which being bound to Jamaica, I do not reckon as belonging to our fleet.

## TABLE II

Shewing the proportional Sickness and Mortality, in relation to the whole Numbers on board, for fourteen Months.

Transcriber's keys: A Proportion of Sick and Wounded on board on the First of the Month. B Proportion of Sick and Wounded sent to the Hospital in the Course of the Month. C Proportion of Deaths on board in the Course of the Month.

Months.	A	B	C
	ONE IN	ONE IN	ONE IN
May, 1780	18½	20½	87
June	13	68½	418
July	17½	80	163
August	18	227	80
September	9	6	188
October	14	25	0
November	33½	192	265
December	16	67	185
January, 1781	14	60½	316
February	18	413	214
March	15½	30	201
April	11	59	169
May	9½	17	188
June	12	40	701
Mean Proportion	15½	93	227

## CHAP. II

Account of the Health of the Fleet from August, 1780, till December following. – The Fleet divided – The principal Squadron goes to North America – Fluctuation between Fevers and Fluxes – The Alcide and Torbay the most sickly Ships – Health mended by the Climate and Diet in North America – Hurricane in the West Indies – Sufferings in consequence of it – Fevers the chief Disease.

The hurricane months approaching, the season for active operations in the West Indies was now over. The whole force

of the enemy, consisting of thirty-fix French and Spanish ships of the line, having gone to St. Domingo in the end of July, ten sail of the line were detached after them from our station, for the protection of Jamaica. The Admiral sailed for North America in August, with eleven ships of the line, leaving six for the protection of the islands.

There was little alteration in the general state of the sick during the voyage to America, and indeed we found no diminution of the West-India heat, which at this season is at the greatest height, until we came to the  $33^{\circ}$  of N. latitude.

The only material alteration in point of health was in the Alcide and Torbay, which had arrived from England with a few men ill of fevers; but in the course of this voyage these two ships became as unhealthy as any that ever came under my observation. There was a greater number of sick on board of them than all the fleet besides, and it increased to such a degree, that upon their arrival at New York, which was in the middle of September, after a passage of three weeks, near one half of their men were unfit for duty. In the Alcide it was a fever that raged; in the Torbay it was a dysentery; and the unusual degree of sickness and mortality which appears in the Table for the month of September, was owing to the very sickly state of these two ships.

### **TABLE III**

Shewing the Number of Fevers and Fluxes on board on the



SHIPS' NAMES, AND Date of their Arrival.	NOVEMBER.				DECEMBER.				JANUARY, 1781.			
	Fever.		Flux.		Fever.		Flux.		Fever.		Flux.	
	B	H	B	H	B	H	B	H	B	H	B	H
Sandwich, 16th March	3	0	5	0	8	0	10	0	9	0	13	0
Terrible, 16th March	continued quite healthy.											
Triumph, 7th May												
Russell, 18th June												
Shrewsbury, 26th June	No return, the Ship being absent.				0	0	13	0	1	0	7	0
Alcide, 30th July	0	0	23	10	0	0	14	0	6	5	17	0
Torbay, 30th July	6	0	5	0	0	1	22	30	5	0	10	1
Monarch, 22d Nov.					3	0	2	0	5	12	15	4
Alfred, 22d November					6	0	5	0	15	16	11	8

We shall hereafter see reason for supposing that fever and dysentery proceed from the same cause; and as both these ships arrived from England in a similar state with regard to health, fevers would probably have been the prevailing disease in both; but a part of the 87th regiment, then serving as marines in the fleet, was put on board of the Torbay at St. Christopher's, and some of them being ill of the dysentery, gave this turn to the disease which afterwards prevailed on board. I have formed a Table to shew the fluctuating state of these two diseases, and this was one of my first and most imperfect attempts towards a medical history of the fleet in a methodical way. ([Table III.](#))

There was but little sickness in the rest of this squadron, except in the Terrible, where the dysentery prevailed a good deal. None of the ships of the line which we found in the West Indies, upon our arrival there, were now in company, except the Yarmouth,

and this was the most healthy of all the ships that went to North America.

The health of the fleet was very much recruited by its short stay in America; for the men were supplied with fresh meat and spruce beer, and they enjoyed the two finest months of the year in that temperate climate. The squadron left New York in the middle of November, and though dispersed by a violent storm, all the ships arrived safe in the West Indies before the middle of December.

In October the fleet had attained such a degree of health, that though the calculation in the Table is made from five of the most sickly ships, no death happened in this month on board of any of them. In November the mortality was also inconsiderable, though the ships left in the West Indies are included in the calculation; which, had it been made upon those only that went to North America, the deaths would have been no more than one in seven hundred and eleven in this month, which is rather less than that of any other month in the Table.

The amendment in health, in consequence of the change of climate, was most remarkable in the *Terrible*, which, by the time she left America, had entirely got rid of the violent dysentery that had prevailed for some time on board. This sudden change in the health of this ship was evidently owing to the great attention of the Captain to cleanliness and discipline, and no less to the assiduity and abilities of the Surgeon. The *Alcide* still continued sickly, though not so much so as the *Torbay*.

The former had sailed on a cruise in October, and having met with very rough weather, the sick list was thereby increased. The dysentery now prevailed in that ship, as well as fevers, and those men chiefly were attacked with fevers who were ill of the scurvy, or recovering from it. This was not very common; and there were several other remarkable particulars with regard to the fevers in this ship; for her men were not only uncommonly subject to this disease, both in America and the West Indies, but to all the various forms of it; the low, infectious, ship fever of Europe, the bilious remitting, and the malignant yellow fever of hot climates. It would appear from this, as well as other instances, that a ship may assume, as it were, a particular constitution, or a tendency to some particular disease, for a length of time, and this depending on some lurking and adhering infection, or the manner in which she may have been victualled, watered, disciplined, or manned.

The great benefit derived to the health of the fleet, from the change of climate, as well as other reasons, justified the Admiral in going to North America; and there was the more merit in this measure, as it was undertaken without precedent, and without instruction. Upon our return we found there was great good fortune in it, as well as wisdom; for there had happened on the 10th of October a more violent hurricane than any in the memory of man, and the ravage it made both by sea and land is, perhaps, unparalleled in history. Several of the ships of the line were exposed to it; but though they suffered extremely, and were in the utmost danger, none were lost. Two of them happened to be

at Antigua, which was out of the track of this hurricane, as it extended only from the 12th to the 15th degree of N. latitude; so that the only islands that suffered by it were Barbadoes, St. Lucia, St. Vincent, and Martinico. – Four frigates, and as many sloops of war, either foundered or were wrecked, and about one thousand seamen perished in them. One of the buildings of the hospital at Barbadoes was entirely demolished by the impetuosity of the sea, which, having risen to a great height, dashed a ship against it, and twenty-three seamen were buried in the ruins<sup>3</sup>.

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<sup>3</sup> Although this hurricane, in itself and its consequences, was so destructive to the lives and health of men, yet, with regard to the inhabitants on shore, it had a surprising and unexpected effect in mending their health. I wrote an account of this hurricane to the late Dr. Hunter, who communicated it to the Royal Society, and the following passage is extracted from it: “The consequences of this general tumult of nature, on the health of man, was none of the least curious of its effects. I made much inquiry on this head, not only of the medical gentlemen who had the charge of hospitals, and of the physicians of the country, but of the inhabitants, and every one had some cure to relate either of themselves or their neighbours, in a variety of diseases. Nor could I find that either those who were in health, or those who were ill of any disease whatever suffered from it, otherwise than by its mechanical violence; but, on the contrary, that there was a general amendment of health. This is a fact, which I could neither credit, nor would venture to relate, were it not supported by so many concurring testimonies. It had a visible good effect on the acute diseases of the climate. The chronic fluxes, of which there were then some at the naval hospital, were cured or much relieved by it. But the diseases upon which it had most evident and sensible effects, were pulmonic consumptions. Some recent cases of phthisis, and even the acute state of pleurisy, was cured by it; and in the advanced and incurable state of it, the hectic fever was removed, and remarkable temporary relief afforded. A delicate lady of my acquaintance, who was ill of a pleurisy at the time, and passed more than ten hours in the open air, sitting generally several inches deep in water, found herself free of complaint next day; had no return of it; and when I saw her a few weeks after, was in much better health and

The Montague suffered most on this occasion, and was also most subject to sickness and mortality, brought on in consequence of the great fatigue and hardships of the men in bringing her into port and refitting her; for the ship was almost torn to pieces both in the rigging and hull, and the bedding and other necessaries and conveniencies were entirely destroyed. The fever that prevailed on board at this time was of the most malignant kind known in this climate; and the worst cases arose in watering, and the other necessary duties on shore, from which the men would sometimes return frantic, and die in a few hours. There was a party of soldiers on board; and as they were not called upon to perform any duties on shore, they had but little sickness in companion of the sailors.

The other ships having suffered less from the storm, were also less sickly, as it was not necessary for them to remain so long in the unhealthy Carenage to repair.

The only disease that prevailed at this time, in these two ships, was fevers, there being few or no fluxes, though they had been so

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looks then usual. The people observed that they had remarkably keen appetites for some time after, and the surviving part of them became uncommonly healthy; some of both sexes, whom I had left fallow and thin a few months before, looking now fresh and plump. It is very difficult to account for this, as well as every thing else in the animal œconomy; but it was probably owing in part, at least, to the very great coldness and purity of the air from the upper regions of the atmosphere. Great agitation of mind sometimes also produces a revolution in health; and we know that the effect of external impressions in general is very different when the mind is vacant, from what it is when occupied and interested by objects, whether of pleasure and satisfaction, or of danger and suffering.”

frequent in the former part of the year. Though fevers and fluxes depend on the same general causes, yet when these causes exist in a higher degree, it would appear that they are more apt to produce fevers. Thus the exhalations of the earth from marshes are more apt to produce fevers; and mere excesses of heat and cold, or moisture, are more apt to produce fluxes; just as in Europe a catarrh, which may be considered as a local febrile affection, as well as a dysentery, will be excited by exposure to cold or damp, without any specific bad quality in the air.

The Ajax and Montague are the only two ships of those left in the West Indies, which are included in the estimate of sickness and mortality in November and December, and they bear a very great proportion to the whole; for out of forty-four that died in fourteen ships of the line in November, twenty died in the Montague, and five in the Ajax; and out of forty-three, the whole number of deaths in December in twenty-one ships of the line, ten were of the Montague, and eleven of the Ajax.

## CHAP. III

Account of the Health of the Fleet from January, 1781, till July, 1781, both Months included. – Arrival of seven Ships of the Line from England – Increase of Sickness in consequence of a Descent on St. Vincent's – Long Cruise to windward of Martinico – Great Prevalence of Scurvy – Difference of Health in different Ships – New Ships not more unhealthy than others – Why Frigates are more

healthy than Ships of the Line – Remarkable Cure of Scurvy in two Ships – Essence of Malt – Vegetables most antiscorbutic in their natural State – Advantage of supplying Refreshments on board of Ships in preference to Hospitals.

We are now come to that period in which our fleet was reinforced with seven ships of the line, which arrived at Barbadoes from England on the 5th of January, 1781, under the command of Lord Hood. This addition, with two which had arrived in November, made the force upon this station again amount to twenty-one ships of the line.

## **TABLE IV**

**Shewing the Number of each Disease on board on the First of each Month, the Numbers sent to the Hospital, and Dead, in the Course of the Month**

KEY:

B On board.

H Sent to the Hospital.

D Dead.

SHIPS' NAMES. N. B. Those marked *, arrived with Lord Hood.	FEBRUARY, 1781.								
	Fever.			Flux.			Scurvy.		
	B	H	D	B	H	D	B	H	D
Sandwich	8	0	0	4	0	0	2	0	0
* Barfleur	8	0	1	4	0	1	3	0	0
* Gibraltar	25	0	2	4	0	0	4	0	0
Triumph	0	0	1	1	0	1	21	8	0
Centaur	2	0	0	2	0	0	20	0	8
Torbay	6	0	0	11	0	0	1	0	0
Monarch	13	0	3	13	0	0	2	0	0
Terrible	2	0	0	10	0	0	1	0	0
Montagu	40	0	8	14	0	5	4	0	0
Alfred	4	0	0	4	0	0	4	0	1
Russel	0	0	0	7	0	1	2	1	0
Alcide	1	0	2	9	0	0	1	0	0
* Invincible	0	0	0	0	0	0	0	0	0
Resolution	1	0	0	7	0	1	0	0	0
Shrewsbury	8	0	0	0	1	1	6	7	0
Ajax	8	0	1	6	0	5	3	0	1
* Princessa	8	0	1	3	0	1	0	0	0
Intrepid	18	1	1	10	4	0	1	0	0
* Belliqueux	11	0	0	10	0	5	0	0	0
* Prince William	21	0	0	17	0	0	4	0	0
* Panther	2	0	0	4	0	0	0	0	0
Triton	7	0	0	15	2	0	14	0	0
Hyena	0	0	0	0	0	0	0	2	0
Cyclops	4	1	0	3	0	0	0	1	0
Total	197	2	19	158	7	21	93	19	10



SHIPS' NAMES. N. B. Those marked *, arrived with Lord Hood.	APRIL.								
	Fever.			Flux.			Scurvy.		
	B	H	D	B	H	D	B	H	D
Sandwich	6	0	2	9	1	1	2	4	0
* Barfleux	24	0	0	25	0	0	33	0	0
* Gibraltar	0	0	1	0	0	0	18	0	0
Triumph	0	0	1	3	0	2	12	0	2
Centaur	1	0	0	3	1	0	55	1	1
Torbay	6	0	0	8	0	0	23	27	2
Monarch	8	0	4	17	0	0	0	0	0
Terrible	0	0	0	10	0	0	4	3	1
Montagu	§	§	§	§	§	§	§	§	§
Alfred	11	0	0	26	0	1	116	44	4
Russel	0	0	0	4	0	1	44	0	3
Akide	1	0	0	3	0	0	8	16	0
* Invincible	4	0	0	4	0	0	2	0	1
Resolution	5	0	0	8	0	2	7	0	1
Shrewsbury	4	3	0	0	0	0	4	6	0
Ajax	4	0	1	15	4	2	30	5	10
* Princessa	6	0	0	1	0	0	40	0	1
Intrepid	9	§	§	13	§	§	1	§	§
* Beliqueux	0	0	0	3	0	0	2	0	0
* Prince William	19	2	0	147	40	0	16	7	0
* Panther	2	0	0	4	3	0	9	1	0
Triton	2	0	0	2	0	0	0	0	0
Hyena	0	0	0	0	0	0	2	0	0
Cyclops	2	0	0	2	0	0	0	0	0
Total	115	5	9	317	49	9	428	115	26

SHIPS' NAMES. N. B. Those marked *, arrived with Lord Hood.	MAY.								
	Fever.			Flux.			Scurvy.		
	B	H	D	B	H	D	B	H	D
Sandwich	2	2	1	10	5	0	5	18	0
* Barfleur	12	3	1	16	1	0	54	10	0
* Gibraltar	4	0	0	0	0	0	30	22	4
Triumph	0	1	1	0	0	0	13	8	1
Centaur	0	0	0	2	0	2	15	4	0
Torbay	6	0	0	13	7	0	44	31	0
Monarch	5	2	2	3	0	0	57	11	0
Terrible	0	0	1	10	4	0	5	20	0
Montagu	§	§	§	§	§	§	§	§	§
Alfred	15	10	1	11	3	0	130	25	2
Russel	0	1	0	8	0	0	132	102	4
Akide	0	0	1	1	0	0	40	35	0
* Invincible	7	0	1	6	8	4	31	54	4
Resolution	5	2	0	9	0	0	15	45	2
Shrewsbury	3	1	0	5	2	0	22	6	2
Ajax	4	1	1	3	0	0	8	0	1
* Princessa	2	0	0	2	0	1	30	40	2
Intrepid	§	§	§	§	§	§	§	§	§
* Beliqueux	0	0	0	2	0	0	2	0	0
* Prince William	5	5	2	53	5	0	7	4	0
* Panther	3	2	0	8	4	0	1	0	0
Triton	2	0	0	4	0	0	0	1	0
Hyena	0	0	0	0	0	0	0	0	0
Cyclops	0	0	0	0	0	0	0	0	0
Total	76	30	12	166	39	7	641	436	22

SHIPS' NAMES. N. B. Those marked *, arrived with Lord Hood.	JUNE.								
	Fever.			Flux.			Scurvy.		
	B	H	D	B	H	D	B	H	D
Sandwich	2	0	0	3	0	0	10	0	1
* Barfleur	20	0	0	13	0	0	58	0	0
* Gibraltar	3	1	0	4	0	0	48	17	0
Triumph	1	0	0	0	0	0	6	5	0
Centaur	4	0	0	9	0	1	15	0	0
Torbay	16	0	0	6	0	0	9	0	1
Monarch	4	3	1	4	0	0	36	5	0
Terrible	3	1	0	12	0	0	20	1	0
Montagu	§	0	0	§	0	2	§	0	0
Alfred	14	§	§	10	0	0	26	0	0
Russel	0	1	0	19	1	0	14	1	0
Akide	4	2	0	5	0	0	26	5	0
* Invincible	8	0	0	22	0	0	10	1	0
Resolution	1	0	0	3	12	0	84	0	2
Shrewsbury	3	§	§	4	§	§	20	§	§
Ajax	2	0	0	2	0	1	6	0	0
* Princessa	2	0	0	6	40	0	70	154	0
Intrepid	§	§	§	§	§	§	§	§	§
* Beliqueux	2	0	1	3	0	0	8	0	0
* Prince William	4	4	2	13	3	1	8	7	0
* Panther	3	0	0	8	1	0	1	1	0
Triton	2	0	1	1	0	0	0	1	0
Hyena	3	0	1	2	0	0	5	0	0
Cyclops	§	§	§	§	§	§	§	§	§
Total	101	12	6	149	57	5	480	198	4

N. B. Where the Spaces are marked thus, §, no Return was made.

The whole fleet was tolerably healthy during this month, the

season being dry and cool; there was, however, a small increase of sickness at this time, and it was owing to a descent made on St. Vincent's in December. The soldiers, (of whom there was still a regiment on board of the fleet) the marines, and some of the seamen, had been on shore for one night only; but many of them having lain on the ground, some having been intoxicated, or having eaten to excess of sugar-cane and fruit, caught fevers and fluxes, which increased the proportion of diseases and deaths the following months, as appears by the Table.

I have exhibited, in another Table, a view of the sickness and mortality of this fleet for the five succeeding months. ([Table IV.](#)) This account, as well as most of those that are to follow, is confined to three diseases, that may be called the sea epidemics. These are, fever, flux, and scurvy.

The whole fleet met at Barbadoes on the 13th of January, and no service was undertaken till the accounts of the Dutch war arrived on the 30th of that month. In consequence of this intelligence, the greater part of the ships of war went against St. Eustatius, which was taken on the 3d of February.

Ten days after this a squadron of seventeen ships of the line was sent to cruise to windward of Martinico, with a view to intercept a French squadron which was then said to be on its passage from Europe. The cruise was there continued for six weeks; after which small divisions of the ships were sent to water and refit, by turns, at St. Lucia, and were relieved by the ships left for the protection of that island.

Soon after this, the whole squadron came to leeward of Martinico; and though the former intelligence had proved false, the greater part of our fleet still kept the sea, in order to block up the enemy in Fort-Royal Bay. This they continued to do till the 29th of April, when a French fleet of twenty-two ships of the line, from Europe, joined by four from Martinico, forced their way into their own port, pushing to leeward our fleet, consisting only of eighteen ships of the line; so that the greater part of them did not get into port till they came to an anchor at Barbadoes on the 23d of May.

It was in this season of cruising, and keeping the sea, that the fleet contracted such a degree of scurvy as had never before been known in the West Indies. This disease is not so apt to arise in a hot climate as in a cold one; and the prevalence of it on this occasion was owing to the men having been for a great length of time upon sea victualling; for one part of the fleet had not had a fresh meal from the time of leaving America, that is, for six months; and that part of it which came last from England had been in the same circumstances for seven months; nor had any of them been in a place capable of supplying vegetable refreshments from the time they left Barbadoes in the end of January. But though no fresh meat or vegetables could be procured at St. Lucia or St. Eustatius, yet the scurvy did not make such progress in the ships that lay at anchor there, as in those that were at sea; and it appears that the time in which it prevailed most was, while the greatest number of ships was at sea, that is, in the month

of March. It appears, indeed, by the Table, that there was a greater number ill of this complaint on the 1st of May than on the 1st of April; but it appears also, that more were sent to the hospital in March than in April, and very near half of the May list must have been taken ill in March<sup>4</sup>. The difference of being in port and at sea consists chiefly, 1st, In there being plenty of water while in port, so that it can be used freely, not only to drink, but to wash the clothes; and we know that cleanliness tends greatly to ward off the scurvy. 2dly, Though no fresh meat nor vegetables could be procured at those ports, sugar, which may be considered as a very antiscorbutic article of diet, could always be procured at a very cheap rate, and the seamen, when in port, used to exchange their salt provisions for it. 3dly, There is at sea a dismal uniformity of life, favourable to indolence and sadness, and therefore tending to hasten the progress and aggravate the symptoms of the scurvy; whereas the change of scene and variety of objects, when in port, tend to cheer and recreate the mind, and thereby to avert this disease.

The squadron that came from England under Lord Hood, suffered, upon the whole, much less from acute diseases, during the first months of their service in this climate, than the ships that arrived with Lord Rodney, which was probably owing, in part at least, to the former having arrived at the driest and coolest

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<sup>4</sup> In order to ascertain more exactly the degree of sickness in each month, a column was afterwards added to the form of the returns, expressing the number taken ill of the several diseases in the course of the month.

season of the year. The *Barfleur*, however, had a large proportion of all the three prevailing diseases; and large ships are in general more subject to them than those of a smaller rate. But of all the ships in the fleet, the *Alfred* had the greatest proportion of the three sea epidemics. The *Prince William* suffered more than any other ship in the fleet from the flux, and the *Princessa* from the scurvy. In some instances, reasons can be assigned for the prevalence of particular diseases in particular ships, such as accidental infection, or the manner in which they have been victualled, manned, or disciplined; but in many cases the cause is so subtle or obscure as to elude our inquiry.

The most healthy of the new squadron, during this campaign, were the *Belliqueux* and *Panther*; the former was a new ship, and came from England with a very irregular and ill-disciplined crew. Soon after arriving in the climate, she was threatened with a dysentery, which, though it spread a good deal, did not prove severe nor mortal; but being left at *St. Eustatius* on this account, while the rest of the fleet was cruising, she soon became very healthy, and remained so. This is the second instance we have had occasion to remark of a new ship being healthy.

The *Panther* preserved her health by being on small separate cruises, and frequently in port, not being attached to the main squadron. The *Sandwich* was the only other ship not engaged in the long cruise.

Of the ships lately from England, that were employed in this cruise, the *Gibraltar* seems to have been the least sickly. This

ship left England healthy; but having received a draft of dirty men when upon the eve of sailing, a fever of the infectious kind broke out on the passage, so that she arrived in the West Indies in a sickly state. This fever disappeared very soon after; and it is proved by this, as well as other facts, that a warm climate, so far from tending to generate, or even to foster the infection of fever, tends rather to extinguish it. The Gibraltar had been put under excellent discipline by her former commander, while in the Channel service; and this being afterwards kept up, the men were always clean and regular. This was the Spanish Admiral's ship, taken by the fleet under the command of Lord Rodney off Cape St. Vincent's, in January 1780. She was then called the Phoenix, and was of a singular excellence both with respect to materials and construction. Whether the cedar, of which a great part of her timbers consisted, contributed to the healthiness, by its balsamic effluvia, I will not pretend to determine.

The Invincible was also uncommonly healthy during this cruise, which may likewise be ascribed to good discipline, and to her having been more than three years in commission before sailing from England, whereby the men were brought into order, and accustomed to each other and to a sea life. This ship was almost singular in having no acute diseases for several months after arriving from Europe; but at length paid the tribute to the climate in May and June, as may be seen in the Table.

From the account of the three frigates at the bottom of the list in the Table, it appears how much more healthy they are

than ships of the line. The total complements of the three is exactly equal to that of one seventy-four-gun ship; but their whole sickness and mortality is less than that of any one ship of the line of that class, although the Triton was uncommonly sickly for a frigate.

There seem to be several causes for the superior degree of health usually enjoyed by this smaller class of ships. There is less chance of mixtures of men in frigates, as their complement is smaller, and it is more easy for the captain and officers to keep an eye over a few men than a great number; for, in a great ship, there are generally men, who, concealing themselves in the most retired parts, no one takes cognizance of them, and they destroy themselves, and infect others, by their laziness and filth. In the next place, there is a greater proportion of volunteers and real seamen in frigates, and more landmen and pressed men in ships of the line, the former being more in request, on account of the greater chance of prize money. Lastly, a small ship is more easily ventilated, and the mass of foul air issuing from the hold, from the victuals, water, and other stores, as well as the effluvia exhaling from the men's bodies, is less than in a large ship.

Many other and more minute remarks might be made on different ships in this season of hard service; but to do this would be tedious, and the inspection of the Tables may suggest observations to the reader. There is a striking and instructive fact, however, with regard to two ships, which I cannot help relating. The Alcide and Invincible, both of seventy-four guns, in

working to windward, after the action with the French fleet, on the 29th of April, anchored at Montserrat on the 11th of May, in order to water. They remained there only part of two days, and they procured no refreshment, except a few bushels of limes. The scurvy then prevailed to a great degree in both ships; but between this time and the 23d of May, when they came to an anchor at Barbadoes, sixty men, who had been confined with this disease, were discharged, as fit for duty, from the sick list of the *Invincible*, and a hundred and fourteen from that of the *Alcide*. These were the only two ships that had the advantage of the limes; and during these twelve remaining days of the voyage the scurvy continued to increase in all the other ships. Dr. Lind is the first author who gives a decided preference to lemons, limes, and oranges, over every other antiscorbutic; and the above-mentioned fact proves as demonstrably as possible the infinite advantage of this species of acid in scurvy.

The fleet was supplied with essence of malt during all this campaign; and though it was, no doubt, of service, it was far from having that powerful and manifest effect that the acid fruits had, and certainly did by no means prevent the scurvy in all cases. I have strong testimonies, however, of its beneficial effects from the surgeons of several of the ships, particularly of the *Gibraltar*, *Centaur*, *Torbay*, and *Alcide*, in all of which it was found either to cure the scurvy in its first beginning, to retard its progress, or to mend the appearance of scorbutic ulcers, and dispose them to heal.

I had conceived that melasses, being a vegetable sweet, must have been a very powerful antiscorbutic; but the greatest part of the last reinforcement of seven ships came from England furnished with this as an article of victualling, as a substitute for a certain proportion of oatmeal, which was withheld agreeably to a late very judicious order of the Admiralty. But though I am persuaded that this article of diet mitigated the disease, it was very far from preventing it; and the *Princessa* in particular, which suffered most from the scurvy, was well supplied with it.

There is reason to think that it is not in the vegetable sweet alone that the antiscorbutic principle resides, but in this in conjunction with the natural mucilage, such as exists in the malt. I suspect likewise that the change which the essence undergoes in its preparation tends also to rob it of some of its original virtue. But the melasses are still farther altered by being deprived of the natural mucilage by means of quick lime, with which all sugar is clarified in the boilers. Dr. Hendy, of Barbadoes, to whom I have been obliged for several remarks, informed me, that the liquor, before it undergoes this operation, has been found by him to produce the most salutary effects in the scurvy; but as this cannot be had at sea, we had no opportunity of comparing it with other antiscorbutics. It is certain also that the medical effects of the native sweet juices are, in other respects, very different from what they are in their refined state; for manna, wort, and the native juice of the sugar cane, are purgative; whereas sugar itself

is not at all so<sup>5</sup>. This affords a presumption, that they may be also different in their antiscorbutic quality; and there is reason to think, from experience, that the more natural the state in which any vegetable is, the greater is its antiscorbutic quality. Vegetables, in the form of sallads, are more powerful than when prepared by fire; and I know, for certain, that the rob of lemons and oranges is not to be compared to the fresh fruit. Raw potatoes have been used with advantage in the fleet, particularly by Mr. Smith, of the Triton, who made the scorbutic men eat them, sliced with vinegar, with great benefit. This accords also with what Dr. Mertens, of Vienna, has lately communicated to the Royal Society of London.

When the fleet arrived at Barbadoes on the 23d of May, it was found that the number of sick on board amounted to sixteen hundred, and that there was not accommodation for more than two hundred at the hospital. As there was hardly any complaint but scurvy, the Admiral, at my representation, issued an order for serving the sick on board of their own ships with fruit and other vegetables and refreshments, such as milk and soft bread. This

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<sup>5</sup> I was informed by Captain Caldwell, that when he commanded the Hannibal, of 50 guns, his crew was so much afflicted with the scurvy, in a passage of nine weeks from St. Helena to Crookhaven, in Ireland, that ninety-two men were confined to their hammocks in the last stage of that disease, though they had been supplied with sugar at St. Helena, and served with it on the passage. They remained three weeks at Crookhaven; at the end of which time every man was fit for duty: and though they had fresh provision, they had no fresh vegetables, so that their cure is to be ascribed to the use of lemons and oranges, which the Captain very humanely ordered to be purchased for them from on board of a foreign ship that happened to put into the same harbour.

course of diet commenced in the beginning of June; and as the greater part of the fleet was near four weeks thereafter in port, they enjoyed the advantages of it during that time; and the very great diminution of sickness and mortality, which appears by the Tables in that month, sufficiently evinces the benefit derived from it. In less than four weeks the fleet, from being very sickly, became extremely healthy.

It was remarked, that the men recovered faster on board than on shore; and it would appear that land air, merely as such, has no share in the cure of the scurvy, and that the benefit arises from the concomitant diet, cleanliness, and recreation. The expedient of curing men on board of their ships was here suggested by necessity; but it succeeded so well, that it was adopted afterwards in preference to an hospital, which is indeed a useful relief to a fleet where there are contagious, acute disorders; but with regard to scurvy, I am convinced, that on foreign stations, at least, where the accommodations of the sick are more indifferent than in England, many advantages would arise from supplying men with refreshments on board of their ships. It appears that only four men died of this disease in the whole fleet in the month of June, though there were so many ill of it; whereas it appears by the books of hospitals, that scorbutic men die there in a much greater proportion, and chiefly in consequence of other diseases, particularly the flux, which they catch by infection, or bring on by intemperance. It is farther in favour of this scheme, that great numbers of those sent on shore are lost by desertion. It is also a

great saving to Government, the expence not being a fourth part of what it would cost at an hospital.

The fleet left Barbadoes on the 10th and 12th of July, and continued healthy till the greater part of it sailed for North America in the beginning of August.

# PART I

## BOOK II

Continuation of the Medical History of the Fleet, from August, 1781, till the Conclusion of the War in April, 1783.

### CHAP. I

Some Account of the Interval between the Campaign of 1781 and the Junction of the Reinforcement from England in April, 1782. – The main Body of the Fleet goes to North America – Lord Rodney goes to England, and returns to the West Indies with twelve Ships of the Line – Health of the Fleet in England – Sickness most prevalent in the Beginning of a War – A natural Tendency to Recovery in Ships and Individuals – Advantages of this Squadron in point of Victualling.

When the main body of the fleet went to America in August, Lord Rodney went to England for the recovery of his health. – Wishing to lay before the public boards several reforms that suggested themselves to me in the course of the late service, I accompanied the Admiral, purposing to return when the season for hostile operations should have brought back the fleet from

the coast of America.

Soon after arriving in England, I presented a memorial<sup>6</sup> to the Board of Admiralty, proposing such means for the preservation of the health of the fleet as had occurred to me during my past service.

The Board of Admiralty considered this memorial with all the attention that could be expected in the general hurry of service, inseparable from a great and extensive war; and I am happy in being able to say, that, in consequence of my application, most of the particulars recommended have since been so far carried into effect as to produce a practical conviction of their utility.

Lord Rodney having recovered his health, hurried out to his station with all the force that could then be equipped, as the enemy were expected at the Caribbee Islands, with a superior force, after their successes against us in the autumn campaign in America.

I had again the honour to accompany the Admiral. He first sailed from Portsmouth, with four ships of the line, on the 14th of December, and was to have been joined by two more that lay ready at Plymouth; but by the time we arrived off this harbour the wind became contrary, whereby we were detained there till the 14th of January, 1782. During this time more ships were got ready, and six were added to the squadron; for the public anxiety at that time called forth every exertion to strengthen this reinforcement, upon which the fate of the whole West Indies was

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<sup>6</sup> [See Appendix to Part II.](#)

supposed to depend.

This fleet cleared the Channel in the midst of a storm, and with the wind at the same time so scanty, that we barely weathered Ushant; but Lord Rodney's perseverance and resolution, stimulated by the exigency of the occasion, banished all hesitation and timidity. The rough weather, and contrary winds, continued through the variable latitudes; but having met with fresh blowing trade winds, common at that season, we had the good fortune to get safe to Barbadoes with the whole squadron on the 19th of February.

All the twelve ships<sup>7</sup> of this reinforcement had been on service for a considerable length of time since they had been last commissioned, except the Anson, a new ship, which had never before been at sea, and the Fame and Yarmouth, which had lately undergone a thorough repair, since which time they had been only for a few weeks at sea in the Channel before they were ordered on this expedition.

The only ship that was sickly when we left England was the Fame, on board of which some pressed men, with the infection about them, had been received from the Conquestadore guardship; and the fever which broke out in Plymouth Sound, where I was first sent for to visit that ship, was probably owing to the infection which these men brought with them. The other

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<sup>7</sup> They were the Formidable and Namur, of 90 guns; the Arrogant, Conqueror, Marlborough, Hercules, and Fame, of 74 guns; the Yarmouth, Repulse, Prothée, Anson, and Nonsuch, of 64 guns.

ships were, upon the whole, healthy; for it appeared by the weekly accounts delivered to the Admiral, that the mortality, including even that of the Fame, for the four weeks before we sailed, had been only one in thirteen hundred, and that there had been about one in twenty-nine on the sick list.

An opportunity offered on this occasion of comparing the health of ships of war in England with that in the West Indies. The health of the fleet in general at home was at this time about the proportion above mentioned; but it is to be remarked, that it was healthier then than in the former part of the war.

Plymouth hospital, which is calculated for twelve hundred men, was not half full; and there were not at this time more than six hundred men at that of Haslar, which is calculated to contain two thousand; but the latter was generally full during the first two or three years of the war, from the great fleets that put into Portsmouth. At one time part of the sick were even obliged to be accommodated with tents in the neighbourhood of the hospital, for want of room. But towards the end of the year 1781 the infectious fever, which constitutes a great part of the sickness in the European seas, was almost extirpated, and in a cruise of five weeks in the north part of the Bay of Biscay, under Admiral Darby, in September and October of this year, only six men were buried in that time from twenty-eight ships of the line.

This was chiefly owing, as I apprehend, to the length of time which the war had continued, in consequence of which the men of the respective ship's companies had been accustomed to each

other, and habituated to the mode of life peculiar to a man of war, regulating themselves according to certain rules of good order and cleanliness. The causes of the fever above mentioned, as shall be more fully illustrated hereafter, are chiefly connected with the circumstances occurring in the beginning of a war, when men of all descriptions are mixed, without proper precautions being taken to guard against the infection imported from jails or guardships. The sickness in the French fleet was still greater in the beginning of the war than in the British; and this has been the case in all the wars of this century. In the fleet commanded by the Comte d'Orvilliers, in 1779, the sickness was so great as to disable many of the ships from service, and great numbers of men were landed at Brest, with a fever so malignant as to infect the inhabitants of the town and country adjacent. I believe, besides, that the general health prevailing at this time in the fleet in England, was, in part, owing to the sour crout and melasses, which were now supplied more amply than had ever been done before. The entire exemption from scurvy in particular is to be ascribed to these improvements in diet.

There is a tendency in acute diseases to wear themselves out, both in individuals that labour under them, and when the infection is introduced into a community. Unless there was such a *vis medicatrix*, there could be no end to the fatality of these distempers; for the infectious matter would go on multiplying itself without end, and would necessarily destroy every person who might be actually attacked, and would infect every person

who might be exposed to it. But animal nature is so constituted, that this poison, after exciting a certain set of motions in the body, loses its effect, and recovery takes place; and those who happen not to be infected at first, become in some measure callous to its impression, by being habitually exposed to it. There is, therefore, a natural proneness to recovery, as well with regard to that indisposition which takes place among a set of men living together, as with regard to a single individual who actually labours under the disease. Thus the most prevailing period of sickness is when men are new to their situation and to each other, so that time of itself may prove the means of prevention as well as of cure.

This consideration, however, ought not to supersede any part of our attention with regard to the scurvy, which does not become spontaneously extinct like acute diseases.

During the three first weeks of this passage from England to the West Indies, there was wet and boisterous weather, but it had very little effect in augmenting sickness; and though it not only subjected the men to fatigue, cold, and damp, but prevented the ships from opening their lower-deck ports till the 2d of February, between the 31st and 32d degree of latitude, thereby producing close air and moisture where the men sleep, yet, in the whole squadron, from its leaving England till this time, there were only seven deaths, four of which were in the Fame.

The only sea epidemic that made its appearance was the infectious ship fever, which, in many cases, was attended with

pleuritic, rheumatic, and other inflammatory symptoms, owing to the cold and wet, to which the men were exposed in the variable latitudes. The warm, dry, fresh breezes which we had during the remainder of the passage, were probably what prevented any bad consequences from the former hardships, for there died only four men from the above-mentioned date till we arrived at Barbadoes; and it appeared by the Admiral's weekly account, that the proportion of the sick neither increased nor diminished from the time we got into a warm climate and fine weather till our arrival on the 19th of February.

This squadron left England with several advantages in point of victualling, which no ships had before enjoyed. They were amply supplied with sour crout and melasses; they had all more or less wine, of an excellent quality; and the Formidable had an entire supply of it, in place of spirits, of which none was put on board. This ship had hitherto, and did for some months afterwards, enjoy an extraordinary, perhaps an unparalleled, degree of health. What farther contributed to the health of this ship was, that she had been long in commission, and most of the recruits with which the crew had been completed were men turned over from other ships. There was also extraordinary medical attention paid, particularly in watching the first beginnings of complaints.

Upon the arrival of the squadron at Barbadoes, it was found, that, the two hostile fleets having returned from North America in the beginning of December, the campaign had opened with the siege of St. Christopher's, which had been invested by twenty-

eight ships of the line, and a considerable army. Our fleet, under Lord Hood, having attempted, with great enterprise and skill, but without success, to relieve it, Lord Rodney made haste to join them with the reinforcement he had brought from England. He remained at anchor at Barbadoes only one night, and in a few days came off Antigua, where he was informed of the surrender of St. Christopher's; and here, on the 25th of February, he was joined by the rest of the fleet in their return to windward.

## CHAP. II

Account of the Health of the Fleet from the Junction of the Squadron from England, till the general Rendezvous at St. Lucia in the Beginning of April. – The Fleet found on the Station very healthy – Health of the Ships from the American Station – Health of the Ships from England compared with that of the Ships found on the Station – Small-pox prevalent – Instance of the remarkable Efficacy of Lemon Juice in curing the Scurvy – Additional Reinforcement from England – Watering Duty dangerous and unhealthy – The most healthy Ships those that had been longest in the Climate – List of the Numbers taken ill of each Complaint in March – Inflammation of the Liver not common in the West Indies.

The fleet which was found in the West Indies consisted of all the sixteen that went from thence to America in August, 1781, (except the Terrible, which had been lost) together with six ships

of the line<sup>8</sup> from the American station, the St. Albans, which arrived from England in November, and the Russel, which had remained in the West Indies during the hurricane months. They were all extremely healthy, having only one man in twenty-eight on the sick list, and very few had been sent to hospitals.

This fleet, after arriving from America, had lain at anchor for three weeks at Barbadoes, where it had the advantage of the vegetable refreshments which that island affords; but during three weeks that it lay at anchor, in the face of the enemy, at St. Christopher's, the men were excluded from all communication with the shore, and had no vegetable food, except some yams, with which they were supplied from Antigua, in place of biscuit, of which there was at this time a scarcity. These ships had therefore been in no port for six weeks, except for a few days that they lay in the road of Antigua refitting, and putting the sick and wounded on shore.

The men had also been deprived of their natural rest, and exposed to the air during all the time that the fleet was at anchor before St. Christopher's; for they had been twice attacked by the enemy in that situation, and were therefore under the necessity of keeping the ships constantly clear for action; yet no increase of sickness followed. This might partly be owing to the eagerness and alacrity of spirits naturally excited in such a situation, and also to the fleet not lying under the lee of any land, and having

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<sup>8</sup> These were the Prince George, of 90; the Bedford, Canada, and Royal Oak, of 74; the America and Prudent, of 64 guns.

springs upon their cables, so that they had all the perflation and all the purity of air which ships enjoy when at sea. The fumigation which ships undergo in battle, has also been thought to contribute to their health.

To whatever cause it was owing, the fleet we found in the West Indies was at this time healthier than that which had just come from England; and there was but little difference in the degree of health of the different ships that composed it. Of those which left the West Indies in August, and returned in December, the only one that could be said to have any epidemic disease was the Prince William, which had never got entirely free from the dysentery that was formerly mentioned as prevailing so much on board of this ship last year. The disease was kept up, by the ship never having been cleared of the men affected with it, and by the crew in general being ill provided with slops<sup>9</sup>, a circumstance that would render them more susceptible of whatever infection they might be exposed to.

There were also some remains of the same disease in the Intrepid, the seeds of it having been more or less continued from the summer of 1780, at which time it prevailed to a most violent degree. The Alfred had a few of all the sea epidemics, and had been for a long time before more or less in the same situation, from a neglect of cleanliness, particularly of the men's persons.

The only ship in which there was any thing like an epidemic

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<sup>9</sup> This is a term in use for the different articles of seamen's cloathing, particularly shirts and trowsers.

was the Canada, This ship, when at home, had for many months before she sailed been in unremitting service, and very little in port. On the passage from England to America, in August, 1781, there broke out a severe dysentery, to which the scorbutic habit of the men, from being so long at sea, probably predisposed them. Though it had abated much in February, 1782, it was then by no means extinct, and continued till April. The Prince George had been in commission all the war, and was a model of discipline and cleanliness, and consequently of health. This continued till the passage from America, when, upon the first cold weather after leaving New York, there broke out a violent dysentery, of which sixteen men died. This is agreeable to what Dr. Lind observes, that the flux may be brought on by a sudden transition, either from cold to heat, or from heat to cold. All the men that were ill of this disease having been sent to the hospital at Barbadoes, and the usual attention to cleanliness having been kept up, the disease entirely vanished.

All the other ships of the American station had been more or less visited with sickness after they left England, except the Bedford. This was probably owing to this ship having been longer in commission than any of the others, that is, for four years, and all that time under the same commander. This last circumstance falls to the lot of few ships; but a great advantage attends it; for the mutual knowledge and attachment of the captain and ship's company is naturally productive of regularity and good discipline, and thereby of health.

The Royal Oak, Prudent, and America, which left England with the Bedford, though they had been afflicted with the scurvy and other complaints soon after arriving in America, had been quite healthy for some time before coming to the West Indies, and were so much so at this period, that, though there were a few sores and slight complaints on their sick lists, there was not a man confined with illness, so as properly to be called sick. The Royal Oak, having been the flag ship of Admiral Arbuthnot, was manned with choice seamen, which is a circumstance generally conducive to health; for these being accustomed to a sea life, are more provident, more handy and methodical in all that relates to diet, cloathing, and cleanliness. The scurvy, which infected her upon first arriving in America, was successfully treated on board by serving to those who were ill of it a mess, composed of soft bread, baked on purpose, and mixed with wine and essence of malt.

The Prudent, though now quite healthy, had been sickly soon after being put into commission in Europe, and upon first arriving in America. She had been uncommonly sickly, when a new ship, upon her first voyage, which was to the East Indies, during the peace. This remarkable degree of sickness was probably owing to a particular experiment that was made in preparing the wood of which she was built. This experiment consisted in soaking the timber for a length of time in a strong pickle, in order to make it less corruptible. The only other ship on which the trial of this was made was the Intrepid; and it has been

already mentioned that this was an extremely sickly ship. The effect of it upon the wood was to cause a constant moisture and mouldiness in the orlops and holds. In the Intrepid, the sickness was never conquered till a practice was followed of pumping and bailing her with great care, and putting a fire into the well for six hours every day, by which means the dampness, and the mildew produced by it, were removed and prevented, and the ship thereby rendered healthy.

The two squadrons being united, and consisting of thirty-four ships of the line, proceeded to St. Lucia, where they arrived on the 1st of March.

I received monthly returns as formerly, and the form of them was improved by adding a column for the numbers taken ill of the several diseases in the course of the month. The returns of February are not complete, there being none for the 1st of that month, as we had not then arrived; but as the returns of the 1st of March have relation to the preceding month, a judgement may be formed of the sickness and mortality of February from the following table:

Extract from the Returns of the 1st of March, 1782.

DISEASES.	Put on the Sick List last Month.	Died last Month.	Sent to the Hospital last Month.
Fevers	53	15	9
Fluxes	263	67	0
Scurvy	121	2	5
Other Complaints	618	25	59
Total	1555	109	73

This account is abstracted from the returns of twenty-nine ships of the line, and two frigates.

The diseases and deaths under the head of “Other Complaints,” is much more numerous in this month than usual, which is chiefly owing to the preceding actions with the enemy, and to the prevalence of the small pox. Of the deaths under this head, seventeen were in consequence of wounds, six from small pox, one from a mortification<sup>10</sup> in the shoulder, and one from consumption.

None of the epidemics affected one part of the squadron more than another, except that the ships last from England had a less proportion of the flux than the rest; and the few cases of this disease that were in these ships arose after their arrival in the climate. The Conqueror and Fame, which were the two most sickly ships, had no complaints but fevers.

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<sup>10</sup> The mortification in the shoulder, mentioned above, was somewhat singular. It happened to a man in the Yarmouth, who, after being for a week ill of a fever and flux, was one day, early in the morning, seized with a pain in the upper part of the right arm, which immediately began to mortify. He soon after became convulsed, and died the same day about two o'clock.

The fevers had now begun to take on some of the characteristic symptoms of the climate; the chief of which is a greater abundance of bile. In the *Repulse*, two men had the yellow colour of the skin, which is so peculiar to the fevers of this climate.

The crew of the *Anson* caught an infectious fever from a guardship in England; and when the *Prothée* sailed, there was a fever of the same kind on board; but from the change of climate, the symptoms became milder, and the disease disappeared in both these ships in the course of this month.

The small pox prevailed more at this time in the fleet than I have ever known it to do either before or since, and that both in the squadron from England and in that from North America. There were six cases in the *Formidable*, all of which did well, though two were of the confluent kind.

Though there needs hardly any additional proof of the extraordinary efficacy of lemon juice in curing the scurvy, yet it may be of service to impress so useful a truth on the mind by mentioning such striking proofs of it as occurred from time to time. The *Arrogant* spoke with a Portuguese vessel near Madeira, from which some of this fruit was procured, and the only scorbutic man on board happening to have some of the most desperate symptoms, such as putrid gums, contracted hams, the calves of the leg hard and livid, and frequent faintings, a fair opportunity offered for trying its virtues. The man was allowed two of them daily, and was perfectly well in sixteen days, during

all which time the ship was at sea, so that it was impossible to ascribe the cure to any other cause.

The fleet remained at St. Lucia from the 1st till the 18th of March, completing the water, provisions and stores, landing the sick at the hospital, and also watching the motions of the enemy, who arrived about the same time at Martinico from the siege of St. Christopher's. During this time we were reinforced with the Duke, of 90 guns, and the Warrior and Valiant, of 74 guns, from England. On the 18th the whole fleet, except the Invincible, which was detached with a convoy to Jamaica, sailed on a cruise to windward of Martinico, in quest of a French convoy expected from Europe; which having eluded us, and got into their own harbour, the whole fleet returned to St. Lucia on the 30th of March, excepting the Prudent, which was sent to Barbadoes.

We found at St. Lucia the Magnificent, of 74, and the Agamemnon, of 64 guns, which were the last reinforcement of this campaign, making the British fleet on this station amount to forty ships of the line, a much greater force than was ever before employed on foreign service. They were all copper bottomed.

The weather continued fine all this month, yet there was some increase of sickness, owing chiefly to the hardship the men underwent in wooding and watering. In Choc Bay, where the fleet watered, there was at this time a higher surf than was ever remembered, which made the operation of watering (at all times noxious in this climate) uncommonly toilsome and dangerous. It was, indeed, next to impracticable; for many longboats were

staved on the beach, by which several men had their limbs broken, and some lost their lives, by being crushed or drowned; but the necessity of the service admitted of no relaxation or delay. There was no increase of wind to account for this surf, so that it was owing either to something in the currents, or to some subterraneous cause; and there had been felt at Barbadoes and St. Lucia, about this time, a slight shock of an earthquake<sup>11</sup>, to which many imputed this extraordinary surf. In other respects, there were fewer causes of sickness than usually occur to a fleet in port in this part of the world; for the air of the road is remarkably pure, and there were fewer temptations and opportunities of intemperance than at the other islands.

The monthly returns of the surgeons were very full and complete; but as it would be tedious to insert at length those of

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<sup>11</sup> Earthquakes are frequent in the West Indies, and perhaps proceed from a weaker operation of the same cause that originally produced the islands themselves, which seem all to have been raised from the sea by subterraneous fire. There are evident vestiges of volcanoes in them all, except Barbadoes; but there are other unequivocal marks of this island having been raised from the bottom of the sea; for it is entirely formed of coral, and other sub-marine productions, of which the strata are broken, and the parts set at angles to each other, as might be expected from such a cause. There is, perhaps, at all times in the caverns of the earth, elastic vapour struggling to vent itself, and when near the surface, it may sometimes overcome the incumbent masses of matter, and produce certain convulsions of nature. In the account of the hurricane which I wrote to Dr. Hunter, I gave reasons for believing, from the testimony of the inhabitants, that hurricanes are attended with earthquakes; and if a conjecture might be advanced concerning the cause of this, it might be said, that as the atmosphere is lighter at that time, by several inches of the barometer, the elastic vapour, confined by the weight of the incumbent earth and atmosphere, being less compressed, may exert some sensible effects, producing a sort of explosion.

every particular ship, and as the number of ships fluctuated in different months, I shall do no more hereafter than set down the general results from calculation, so as to shew the proportional prevalence of disease and mortality in each month.

## **Table, shewing the proportional Sickness and Mortality in March**

Transcriber's Keys:

A Proportion of those taken ill in the Course of this Month.

B Proportion of those who died, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	20	64
Fluxes	35	71
Scurvy	126	0
Other Complaints	33	108
General Proportion	9	76

The first column is formed by dividing the whole number on board by the number taken ill. The second column is formed by first adding the number ill on board on the first of the month to the number taken ill during the month, subtracting from this sum the number sent to the hospital, and dividing the remainder by the number of deaths.

The number on the sick list of twenty-eight ships of the line, and two frigates, on the first of this month, was eight hundred and forty-five; the number put on the lists in the course of the month was one thousand eight hundred and eighty-four; and the number sent to the hospital in the same time was three hundred and seventy-three; and there died on board thirty-one.

The total mortality this month, in relation to the whole number of men on board, was one in six hundred and seven.

It almost always happens, that ships of war are more or less short of complement, and allowance is made for this in all the calculations; for having had an opportunity of inspecting the weekly accounts delivered to the Admiral, it was always in my power to be informed how many there were short of the legal complement of men in each ship.

It appears, from comparing the Tables of this month with those of the preceding, that there had been a great increase of fevers and fluxes, particularly of the latter. The fevers prevailed chiefly in the ships lately from England, especially the Fame and Conqueror. In the Duke there were a great number ill of fevers; but this ship not having arrived from England till after the first of the month, is not included in the calculation. The fluxes were most prevalent in the ships we found on the station, particularly the Canada, Resolution, and Nymph frigate. The scurvy had increased very little, but prevailed most in the ships we found here. The only ships of the new squadron that had this disease to a considerable degree, were the Conqueror and Nonsuch. The

former had indeed a good many ill of it; but the return having been made in an imperfect manner, this ship is not included in the calculation.

But the ships that were by far the most healthy were those that had been the longest from England, the Ajax, Russel, Montague, Royal Oak, and Prudent. There had been formerly a great mortality in all these ships; and it would appear that this uncommon degree of health was owing, in some measure at least, to this circumstance, that the most weakly had been swept off by the different distempers to which they were exposed; so that only the more hardy and robust had survived.

Under the head of "Other Complaints," a much smaller number were put on the list, and still fewer died, in this than the preceding month. This difference is owing to the number that died of wounds last month.

There died on board, in the course of this month, thirteen of fevers, seven of fluxes, and seven of other complaints, of whom five died of small pox, one of asthma, and one of wounds he received at St. Christopher's.

In order to show more fully and minutely what are the complaints incident to fleets in this climate, I shall set down a list of the numbers taken ill of the different diseases and accidents during this month, extracted from the returns of twenty-eight ships of the line, and two frigates.

Fevers	806
Fluxes	463
Scurvy	130
Ulcers	129
Small pox	49
Pectoral complaints	40
Venereal complaints	32
Colds	30
Rheumatism	18
Angina	10
Gravel	3
Dropsy	1
Ophthalmia	1
Leprosy	1
Fistula in ano	3
Hernia humoralis	1
Abscess	1
Fractures	3
Various slight accidents, as bruises, cuts, scalds, &c.	163
Total	1884

The number of ulcers bears here a smaller proportion to the whole than it does in general to the sum total of the sick list; for being the most tedious of all complaints, they consequently accumulate more than any other. Thus many of the cases now set down as slight accidents, will, in the ensuing month, be in the state of obstinate ulcers.

Most of the diseases of one hot climate resemble those of another, so far as I know; but there is one disease which we hear of as being extremely prevalent all over the East Indies, which is

hardly ever met with in the tropical regions of the West. This is the inflammation of the liver, of which I remember to have seen only one well-marked case, and it was that of a gentleman who had been in the East Indies, and had been subject to it there: nor do I recollect more than one, or at most two, cases of this sort out of several thousand cases of various diseases that were reported to me. This is either owing to the greater heat and dryness of the air in the East Indies, or some other peculiarity with which we are not acquainted<sup>12</sup>.

Every other inflammatory complaint exists more or less, though they are much rarer than in cold and temperate climates. The phthisis pulmonalis is not so common as in cold climates, but proves sooner fatal to most constitutions. There are certain pulmonic complaints, particularly those of the asthmatic kind, to which the climate of the West Indies is remarkably favourable;

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<sup>12</sup> Since the publication of the first edition of this work I have been informed that this complaint is not so rare on shore as in the fleet, which may be partly owing to the greater coolness of the air at sea, and partly from the seamen not having been a sufficient length of time in the climate to be affected with this disease, as few of them had been more than two years from England. But as this affection of the liver was very common in the fleets and naval hospitals in the East Indies, it is evident that there is a great difference of the climates in this respect. It is worth remarking, that it sometimes breaks out in the West-India Islands like an epidemic. The complaint, for instance, was very little known in the island of Grenada, till about the year 1785, when it became very frequent in a particular quarter of the island; and the gentleman who sent the description of it to England alledged, that there were the most unequivocal proofs of its being contagious. It was most successfully treated by very copious bloodletting, and in exciting a salivation by mercury. See Dr. Duncan's Medical Commentaries, Decad. 2, vol. I.

but those in which there are tubercles and ulceration seem to be hurried faster to a fatal termination. The climates, from the thirtieth to the fortieth degree of latitude, seem to be best suited to consumptive complaints. The rheumatisms that occur in hot climates are mostly of the chronic kind.

## CHAP. III

State of Health of the Fleet in April 1782 – Battles on the 9th and 12th – The Fleet very healthy – from the Quality of Provisions – from the Effects of Victory – Advantages of close Action – What Diseases most prevalent – Extraordinary Degree of Health in the Formidable.

This month being interesting, on account of the memorable engagements that happened in it, the remarks shall, for this reason, be somewhat more full and particular.

Three ships of the line having been sent to protect convoys to Jamaica, and one having been sent to protect a convoy to Barbadoes, there remained thirty-six at St. Lucia in the beginning of this month. By the end of the first week their damages were repaired, their water and provisions complete, and the sick in a great measure recovered.

An equal force of the enemy lay over against us at Martinico, the two powers of Britain and France being to make this distant quarter of the world the theatre for trying their strength, and deciding the sovereignty of the seas. In the view of this great

event, our commander forwarded the necessary duties of the fleet with such zeal and diligence, and watched the motions of the enemy with such vigilance, that he overtook their grand squadron a few hours after they left their own port, and engaged them two several days, with a success, glorious and complete.

Nothing had been wanting to equip this fleet for the great and decisive exertion it was to make. Every ship, except two, might be said to be healthy, most of them were complete in men, well appointed with officers, and well found in stores and provisions. – Conformable to this was the eagerness, the confidence, and resolution, which led them to success and victory.

After this battle, the whole fleet, with the prizes, bore away for Jamaica, where part of it arrived on the last days of April, but the greater part of it kept the sea, till after the middle of May.

As this month is more than usually interesting, the tables are given at full length, and a column is added for the wounded.

The sum total, of the numbers of the men on board of the thirty-six ships that composed the line of battle on the 12th of April, was 21,608, and the mortality during the month, exclusive of those who were killed or died of wounds, was one in 862.

There was less sickness, and less death, from disease in this month, than any of the former twenty-three months, in which I kept records of the fleet, and less than in any subsequent month, till the fleet got to the coast of America.

To account for this, it is to be observed, that the men had not been exposed to the noxious air of the shore in watering, as in

the preceding month: they had received from England a fresh supply of provisions, among which was sour krout, melasses, and essence of malt, all in addition to the ordinary articles of victualling: many of the ships were supplied with wine, in place of rum, and as the weather was all along dry and fine, the men suffered the less from the exposure and want of sleep, which are the necessary consequences of keeping ships clear for battle for several days and nights together.

## **TABLE V**

### **ABSTRACT of the RETURNS for APRIL, 1782**

Transcriber's Keys:

F Sick on board on the 1st of the Month.

M Put on the List during the Month.

D Dead.

H Sent to the Hospital.

SHIPS' NAMES	FEVER.				FLUX.			
	F	M	D	H	F	M	D	H
* Formidable	0	6	0	1	2	7	0	0
Barfleur	6	20	0	1	5	13	0	1
Prince George	0	12	2	1	4	18	1	0
* Duke	57	78	2	32	0	3	0	0
* Namur	5	14	0	2	11	9	0	3
Royal Oak	1	4	0	0	11	23	0	3
Alfred	8	46	1	0	6	14	0	0
Montagu	6	11	0	0	8	2	1	5
* Valiant	§	10	1	0	§	0	0	0
Monarch	5	21	1	0	3	10	0	1
* Warrior	0	2	0	0	6	12	0	0
Centaur	12	20	0	1	10	15	0	1
* Magnificent	0	21	0	0	0	8	0	0
Bedford	11	20	0	0	3	27	0	0
Ajax	0	0	0	0	0	0	0	0
Canada	0	6	1	4	24	70	2	0
Resolution	19	25	1	0	21	27	0	0
* Hercules	2	38	0	4	5	18	0	0
Russel	3	3	0	0	5	4	0	0
* Fame	36	50	0	0	3	8	1	0
Torbay	10	10	0	0	9	2	0	0
Princessa	1	2	0	0	2	8	0	3
* Conqueror	30	§	1	11	0	§	0	0
* Arrogant	2	16	0	0	6	33	0	0
* Marlborough	7	19	2	0	12	21	1	0
* Yarmouth	0	3	0	0	4	3	0	0
Belliqueux	43	118	0	0	6	4	0	2
Prince William	4	27	0	0	2	24	0	0
* Repulse	20	40	0	0	2	2	0	0
St. Albans	1	22	0	0	0	6	1	0
* Agamemnon	2	5	0	0	0	1	0	0
* Prothée	6	13	1	0	5	49	0	0
America	2	5	0	0	3	14	0	0



SHIPS' NAMES	SCURVY.				WOUNDS.			
	F	M	D	H	F	M	D	H
* Formidable	0	5	0	0	0	37	0	0
Barfleur	6	30	0	1	0	37	8	6
Prince George	0	7	0	0	0	14	3	0
* Duke	0	1	0	0	0	60	2	0
* Namur	8	5	0	2	0	25	0	0
Royal Oak	1	1	0	1	0	54	5	15
Alfred	15	14	0	2	0	30	0	0
Montagu	2	2	0	0	0	25	5	0
* Valiant	§	0	0	0	0	37	0	0
Monarch	0	1	0	1	0	33	2	1
* Warrior	0	0	0	0	0	20	0	0
Centaur	5	15	0	0	0	14	0	0
* Magnificent	7	16	0	0	0	20	0	0
Bedford	1	10	0	0	0	17	4	0
Ajax	0	0	0	0	0	30	1	5
Canada	1	8	0	0	1	12	0	0
Resolution	0	0	0	0	0	19	2	0
* Hercules	0	12	0	2	0	18	0	0
Russel	0	1	0	0	4	29	3	1
* Fame	0	7	2	0	1	12	2	0
Torbay	3	2	0	0	0	25	3	0
Princessa	0	0	0	0	0	19	2	0
* Conqueror	10	§	0	0	0	23	2	0
* Arrogant	4	10	0	0	0	11	0	0
* Marlborough	0	6	0	0	0	16	1	1
* Yarmouth	3	3	0	0	0	33	2	0
Belliqueux	0	3	0	0	0	10	0	0
Prince William	5	18	0	0	1	0	0	0
* Repulse	3	2	0	0	0	9	1	0
St. Albans	0	0	0	0	0	7	1	0
* Agamemnon	0	0	0	0	0	23	7	0
* Prothée	0	0	0	0	0	24	2	0
America	2	0	0	0	1	27	2	0

N. B. The Ships marked thus, \*, came from England in February and March, 1782.

All the Ships named in the Table were in the Engagements in April, except the Ramillies and the two Frigates.

In the Spaces marked thus, §, no Return was made.

Might not this extraordinary degree of health have also been owing, in part, to the effects of success upon the spirits of the men? It is related<sup>13</sup>, that, when the fleet under Admiral Matthews was off Toulon, in daily expectation for some time of engaging the combined fleet of France and Spain, there was a general stop put to the progress of disease, particularly of the scurvy, from the influence of that generous flow of spirits, with which the prospect of battle inspires British seamen. But if the mere expectation and ardour of a battle, without any happy event, could have such a sensible effect, what must have been the effect of the exultation of VICTORY, a victory in which the naval glory of our country was revived and retrieved, after a series of misfortunes and disgraces, which had well nigh extinguished the national pride in every department of service! The plain and honest, though unthinking seaman, is not less affected by this than the more enlightened lover of his country. Even the invalids at the hospital demonstrated their joy, upon hearing of this victory, by hoisting shreds of coloured cloth on their crutches.

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<sup>13</sup> Dr. Lind, on the authority of Mr. Ives, surgeon to Admiral Matthews.

It would appear, that there is something in situations of exertion and danger, which infuses a sort of preternatural vigour. When the mind is interested and agitated by active and generous affections, the body forgets its wants and feelings, and is capable of a degree of labour and exertion, which it could not undergo in cold blood. The quantity of muscular action employed in fighting at a great gun for a few hours, is perhaps more than what is commonly employed in a week in the ordinary course of life, and though performed in the midst of heat and smoke, and generally with the want of food and drink, yet the powers of nature are not exhausted nor overstrained; even the smart of wounds is not felt; and the future health of those who survive unhurt by external violence is so far from being injured, that it is sometimes mended by this violent, but salutary agitation.

The loss in action, and the number of mortal wounds, were not so great as might have been expected in a battle continued for a whole day. This advantage was owing to the superiority of our fire, as well as to the closeness of the fight, of which the Commander in Chief set the illustrious example, by penetrating the enemy's line with his own ship; a bold and singular effort which first decided the event of the day. When ships in action are opposed to each other at a small distance, the velocity of cannon balls is so great, that in penetrating a ship's side, few or no splinters are torn off; and by these more men are commonly killed and wounded, than by the ball itself. For the same reason, a close shot does less damage also to the ship itself, than a

distant one; for a quick-flying ball makes an aperture less than its own diameter, whereas a spent one produces innumerable deadly splinters, at the same time shivering the object it strikes, and making wide and extensive rents in it. The proportion of the wounded to the killed, is also greater in distant, than in close fight, on account of the great number of small splinters; and we have an experimental proof of this, in comparing the action in Fort Royal Bay in April 1781, with this near Dominica in April 1782. In the former, the enemy having kept far to windward, and engaged at a great distance, the proportion of the wounded to the killed was considerably more than four to one<sup>14</sup>; whereas in the latter, where the greater part of the battle was close, the proportion of the wounded to the killed, was little more than three to one<sup>15</sup>.

Though it is a remark not belonging to a medical work, yet it may be observed, that the greatest advantage that arose to us from close action was, that the fire of the enemy was thereby silenced; for the advantages would be mutual and equal, on the supposition, that the French, in such a situation, were to keep

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<sup>14</sup> London Gazette, *June*, 1781.

<sup>15</sup> This is well illustrated by the manner in which Captain Nott, of the Centaur, was killed in Fort-Royal Bay. This brave man, having carried his Ship nearer the enemy than the rest of the line, but nevertheless at a great distance, had his signal made to keep the line, and having gone into his cabin, as it is said, to examine the import of the signal, a cannon ball struck him in the groin, and it was so far spent, that it stuck in his body. It tore away a whole plank of the ship's side, the splinters of which killed a young gentleman, the only person near him.

the deck, and stand to their guns equally well with the British seamen.

It appears, by examining the table, that the ships in which the fevers chiefly prevailed this month, were those that came last from England, and that those in which the fluxes prevailed most were chiefly of the squadron we found on the station, namely, the Canada, Resolution, and Prince William. The latter however recovered greatly in the course of this month. Some of the Ships that arrived last from England, namely, the Arrogant, Prothée, and Anson, were also considerably afflicted with fluxes, but they were of an extremely mild kind; and the small number of deaths from this disease in comparison with those from fevers, is a proof of a former observation, that this is the safest form in which an acute disease can shew itself. This small degree of mortality was also owing to the judicious method of treating it which was in general practised throughout the fleet; and it is but justice to the medical gentlemen to say, that they shewed on this, as well as every other occasion, great skill and attention in the treatment of the sick and wounded.

The sum total of fevers and fluxes that have been put on the list this month, is much the same as that of the preceding month; but the proportion of fluxes in April is much greater.

The proportion of scurvy is somewhat increased; which is not to be wondered at, when it is considered, that though the fleet had not been so long at sea as is necessary to produce it, especially in this climate, yet the men having had no refreshments when last

in port, may be considered as having been all that time at sea.

The superior degree of health in this month will appear in a still stronger light, if we cast our eye on the column expressing the number sent to the hospital, the proportion of which is, comparatively, very small.

The ships that had been the longest from England, were still among the most healthy. But of all the fleet, none was so free from sickness and mortality as the Formidable. No man belonging to this ship died of disease for the first four months after sailing from Plymouth, though there were at times 900 men on board, and never less than the established complement, which is 750; and so few were taken sick in that time, that only thirteen were sent to hospitals, and their complaints were small-pox and ulcers.

This ship left England provided with every thing that could be supposed to conduce to the health of men, and may be considered as an experiment to prove what degree of health may be attained by proper management and attention. She was furnished not only with abundance of sour krout, melasses, and essence of malt, in common with the other ships; but what was peculiar to her, was an entire supply of excellent wine, in place of spirits, of which none was used during the period mentioned.

## CHAP. IV

Account of the Health of the Fleet while it lay at Jamaica

during May, June, and Part of July, 1782. – French Prizes Causes of Sickness – Their Difference from the English in point of Cleanliness and Discipline – Bad Effects of Land Wind and Watering Duty – Situation of Port Royal – Season uncommonly dry and windy – Fluxes more prevalent at Sea than in Harbour – Comparison of the Sickness at this Time with that of the Army and with that of the Squadron under Admiral Vernon forty-one Years before – Effects of Contagion and foul Air – Officers more affected than the common Men.

All the squadron that was left to windward of Jamaica, consisting of twenty-four ships of the line, kept the sea during great part of May, the last division of it not having come to Port Royal till the 25th of that month.

The whole fleet remained in harbour during the remainder of the month, and the whole of the next, except the Warrior, Prothée, and Russell; the two former were sent on a cruise, in which the Warrior continued quite healthy, as she had been ever since her arrival from England; and in the Prothée a great check was given to the fevers and fluxes which had begun to prevail at Port Royal. The Russell was sent to England with a convoy.

## **Table, shewing the proportional Prevalence of Sickness and Mortality in May**

Transcriber's Keys:

A Proportion of those taken ill or wounded in the Course of the Month.

B Proportion of those that died in relation to the Numbers of Sick or wounded.

DISEASES.	A	B
	ONE IN	
Fevers	26	29
Fluxes	18	63
Scurvy	57	34
Wounds	627	60
Other Complaints	44	127
General Proportion, including wounded	7½	46
General Proportion, exclusive of Wounds	8	48

The whole number of sick on board on the first of this month, in thirty-six ships of the line and two frigates, upon which the preceding calculation is formed, was one thousand four hundred and eighteen. The whole number taken ill in the course of the month was two thousand eight hundred and twenty-eight; the number sent to the hospital was one hundred and seventy-three; and there died on board ninety-four.

The proportion of those who died this month, in relation to the whole number on board, was one in two hundred and eighty-seven.

There was a considerable increase of sickness and mortality this month in all the common diseases, and chiefly in that part

of the squadron which was in port. There was less increase in the number of fevers than either of the other two epidemics; but such was their increased malignancy, that more died of them than of both the others. The number of fluxes was more than double of what it was the preceding month, and the mortality from them was also in a much greater proportion, as may be seen from the Tables.

The fevers prevailed chiefly in port, and the fluxes at sea. A good many of the latter, indeed, arose in the Alcide, though constantly in port; but this seemed to be owing to contagion conveyed by some British soldiers, who were sent on board of this ship after being retaken in one of the French men of war, several of whom were ill of this disease. But there were few fluxes in those ships at Jamaica in which the most malignant fevers appeared. There were a few in those in which the fevers arose from the air of the marshes on the watering duty; but there were none on board of the French prizes, nor in those ships in which that sort of fever was which proceeded from a similar cause, that is, filth and animal effluvia. Upon the whole, in those ships in which the fever was most malignant, there the fewest fluxes were found.

Several circumstances contributed to the increase of sickness and mortality this month.

1st. The infection, or rather the foul air, of the French prizes, in most of which a very bad fever broke out among the officers and men that were sent from the ships of our fleet to take charge

of them.

The discipline and internal oeconomy of the French ships of war are greatly inferior to those of the British. Their decks are never washed, and there is a great defect in every point of cleanliness and order. The free course of the air is obstructed by lumber of every kind, and by bulkheads, which are not taken down even in the time of battle; and the gratings are covered night and day with tarpaulins, even in a hot climate. There are not even scuppers opened on the lower deck as outlets to the water and filth, which necessarily accumulate there, and for which the only vent is a pipe contrived on purpose, passing from that deck along the ship's side into the hold, which becomes thereby a common sink, inconceivably putrid and offensive. And in addition to the ordinary causes of corruption, there was one peculiar to the occasion; for the blood, the mangled limbs, and even whole bodies of men, were cast into the orlop, or hold, and lay there putrifying for some time. The common sailors among the French have a superstitious aversion to the throwing of bodies overboard immediately after they are killed, the friends of the deceased wishing to reserve their remains, in order to perform a religious ceremony over them when the hurry and danger of the day shall be over. When, therefore, the ballast, or other contents of the holds of these ships, came to be stirred, and the putrid effluvia thereby let loose, there was then a visible increase of sickness. For the first three weeks after the capture, the stench proceeding from the numbers of wounded men contributed also

to taint the air.

The Ville de Paris was much more sickly than the other prizes, not only from her being larger, and thereby containing a greater mass of foul air, but by receiving the surviving part of the crew of the Santa Monica, one of our frigates, which had been cast away on the Virgin Islands, and whose men were so reduced by hardship and intemperance, that most of them were taken ill as soon as they came to breathe the unwholesome air of the French prize. To whatever cause it was owing, the fever was much more violent here than in the other prizes, and it generally carried men off on the third or fourth day; and what is remarkable, the officers were affected by it in a greater proportion than the common men. One lieutenant, and every warrant officer, except the boatswain, died of it. This was a proof that the sickliness was owing to the bad air, and not to the intemperance and irregularity so usual on board of prizes, which only the common men give into; and the probable cause of the officers being most affected is, that they were accustomed in common to a purer air, by living in the most clean and airy parts of the ship.

It is also remarkable, that the Ville de Paris was healthy when taken, and had been so ever since leaving France in March, 1781; nor had any other of the captured ships of the line been sickly for some time before, except the Ardent, when she arrived at Martinico four months before, at which time the greater part of the crew were sent to the hospital with fevers. This, as well as other facts of the same kind, tends to prove, that when men come

to be much habituated to bad air, their health is not affected by it.

The French ships were purified by washing and scraping, by fumigating daily with gunpowder and vinegar, and by the use of wind sails; but nothing seemed to contribute so much to sweeten the air in them as burning fires in the hold; for this tended both to make the putrid matter exhale, and to carry it off, by producing a perpetual change of air. Captain Curgenvén, who at this time commanded the *Ville de Paris*, had great merit from his very assiduous and successful endeavours in so difficult a duty as the management and equipment of this great ship. In consequence of the judicious measures taken, and the men becoming more used to the bad air, the sickness ceased in the course of a few weeks.

In the accounts given in the tables, the French prizes are not included, for the disorderly state in which they were at this time prevented my receiving regular returns: but having made inquiry concerning the mortality in the *Ville de Paris*, I found, that of a crew of three hundred and twelve men, there died ten in the month of May, and there were thirty sent to the hospital, whose cases were so unfavourable, that about one half died. The only diseases were fevers. The surgeon of the *Ardent* told me about the same time, that one third of the crew of that ship was ill of fevers.

The second cause of the prevalence of sickness, while the fleet was at Jamaica, was, the watering duty, which was carried on at Rock-fort, about three leagues from Port Royal. It was the practice of many of the ships to leave the water casks on shore

all night, with men to watch them; and as there is a land wind in the night, which blows over some ponds and marshes, there were hardly any of the men employed on that duty who were not seized with a fever of a very bad sort, of which a great many died. The ships that followed a different practice were somewhat longer in watering; but this was much more than compensated by their preserving the health and saving the lives of their men.

The land wind which blows on the shore in the night time, is a circumstance in which Jamaica differs from the small islands to windward, over which the trade wind blows without any interruption: but though this land wind blows upon Port Royal from some marshes at a few miles distance, it does not seem to produce sickness, for it is a very healthy place, and several of the ships enjoyed as good health as in the best situations on the windward station. The bay which forms this harbour is bounded towards the sea by a peninsula of a singular form, being more than ten miles in length, and not a quarter of a mile broad at any part. Great part of it is swampy and overgrown with mangroves, and though of such small extent, we fancied that some of the ships that lay immediately to leeward of this part were more sickly than those that were close to the town of Port Royal, which stands at the very extremity of this long peninsula upon a dry, gravelly soil.

The weather this month was uniformly dry in port; but at sea the air was moist and hazy. Between Jamaica and Hispaniola, where part of the squadron was left to cruise, dead calms

prevailed; and this, joined to the moisture of the air, was probably what caused the flux to prevail chiefly in this part of the fleet. At Port Royal, on the contrary, there was a strong dry breeze, which set in every day about nine o'clock in the morning, and blew all day so fresh, that there was frequently danger in passing from one ship to another in boats. This is called, in the language of the country, the *fiery sea breeze*, an epithet which it seems to have got not from its absolute heat, but from the feverish feeling which it occasions by drying up the perspiration. It was remarked, that this breeze was stronger this season than had ever been remembered; and it sometimes even blew all night, preventing the land breeze from taking its usual course. This year was farther remarkable for the want of the rains that were wont to fall in the months of May and June. We shall have occasion to remark hereafter, that this was a very uncommon season also in Europe and America. The heat, by the thermometer, this month, on board of a ship at Port Royal, was, in general, when lowest in the night, at  $77^{\circ}$ , and when highest in the day, in the shade, at  $83^{\circ}$ .

There was a considerable increase of scurvy in this month, compared with the former months of this campaign; but very inconsiderable, compared with what had occurred in cruises of the same length in former years. The last division of the fleet had been at sea seven weeks, all but one day, when it arrived at Port Royal; and though the scurvy had appeared in several of the ships, it did not prevail in any of them to a great degree, except in the *Nonsuch*. Out of fourteen deaths which happened in the

whole fleet from this disease, in May, seven of them were in this ship, and several were sent from her to the hospital in the last and most desperate stage of it. But, upon the whole, the cases of the true sea scurvy in the fleet, in general, were few and slight, and a great many of those given in the reports under the head of scurvy, were cutaneous eruptions or ulcers, not properly to be classed with it.

The cruise in the preceding year to windward of Martinico, may be compared with that in May of this year; for the fleet in both cases had been at sea about the same length of time. But the comparison is very greatly in favour of the latter, which is most probably to be imputed to the plentiful supply of melasses, wine, sour krout, and essence of malt. But no adequate reason that I could discover can be assigned for the prevalence of it in the Nonsuch to a degree so much more violent than in the other ships; and it was here farther remarkable, that it attacked every description of men indiscriminately; for I was assured by the officers and by the surgeon, that not only the helpless and dispirited landsman was affected, but old seamen, who had never before suffered from it on the longest cruises. I have been led by this, and some other facts, to suspect that there may be something contagious in this disease.

## JUNE

The greater part of the fleet remained at Jamaica during this

month, refitting and watering. Twelve ships of the line were sent to sea on the 17th, under the command of Rear-admiral Drake, but not being able to get to windward on account of the fresh breezes that prevailed, they returned to Port Royal on the 28th. Such of these ships as were sickly, became more healthy while at sea; but some bad fevers arose, particularly in the Princessa; and it is a curious circumstance, that these fevers attacked only those men who had been on shore on the watering duty; from which it would appear, that something caught or imbibed, which is the cause of the fever, lies inactive for some time in the constitution, some of the men not having been affected for more than a week after they had been at sea.

The weather continued dry and windy, as in the former month; but the heat was in general about two degrees higher, the thermometer varying from  $79^{\circ}$  to  $84\frac{1}{2}^{\circ}$ .

### **Table, shewing the proportional Sickness and Mortality in June**

Transcriber's Keys:

A Proportion of those taken ill in the Course of this Month.

B Proportion of those who died, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	11	19
Fluxes	20	83
Scurvy	47	231
Other Complaints	37	97
General Proportion	6	39

The proportion of deaths in relation to the whole numbers on board, was one in one hundred and thirty-eight.

There was only one in thirty of the sick sent to the hospital in the course of this month.

There was an increase both in the numbers and fatality of fevers. This increase was chiefly in that sort of fever which depends on the air and climate, the greater part of which was caught on the watering duty. There was a diminution of those fevers depending on infection, and the foul air of ships, which arose in the French prizes. The care that was taken in purifying these ships was very effectual; for only four died this month in the *Ville de Paris*, and fewer also were sent to the hospital than in May. The increase of the other kind of fever was chiefly owing to there being a greater number of ships in port, the crews of which were employed in watering, and partly, no doubt, to the increase of heat in the weather. The ships in which the fevers were most fatal were the *Monarch*, the *Duke*, the *Torbay*, and the *Resolution*. The sickness in the *Duke* was still in a great measure owing to the same infection that had hitherto prevailed; for this

ship had never been cleared of the infectious fever, for want of room at the hospital. That which broke out in the Torbay was also of the low infectious kind, few of them having the symptoms of that which is peculiar to the climate, which prevailed in the other ships. This ship, though formerly very subject to infectious complaints, had been remarkably healthy for some time past; but it would appear that there was a large stock of latent infection, which shewed itself from time to time.

Some ships, particularly the Montague and Royal Oak, had no increase of fevers or other complaints, though the one lay in port for seven, and the other for eleven weeks, and were more or less exposed to the causes of sickness which affected the rest of the fleet. This is a proof, among many others, that a particular combination of causes is necessary to produce a disease: no single one, however powerful, being sufficient, without the concurrence of others. What seemed to be wanting here was the predisposition requisite for the admission of disease into the constitution; for the ships that enjoyed this happy exemption were such as had long-established and well-regulated crews, accustomed to the service and climate.

There had been this month a diminution both of the numbers and mortality of fluxes, which is agreeable to what was before remarked, that fevers were more apt than fluxes to prevail in the bad air of a harbour<sup>16</sup>. It was also before remarked, that there

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<sup>16</sup> I have seen an account of the diseases of the army at St. Lucia for a whole year, kept by Mr. Everard Home, an ingenious gentleman belonging to the army

were few or no fluxes in those ships in which the fever was most malignant; and now that the fever began to grow more mild in the French prizes, the flux began to appear. In the Barfleur, Duke, and Namur, both diseases seemed to prevail equally; but the fevers, though numerous, were more of the low nervous kind than bilious or malignant; and the fluxes chiefly attacked those who were recovering from fevers. We may farther remark, that these three men of war were three-decked ships, of 90 guns, the crews of which being more numerous, and composed of a more mixed set of men, were consequently subject to a greater chance of infection, and a greater variety of complaints. The Formidable still remained healthy to an extraordinary degree. Some fevers were indeed imported from the Ville de Paris by men that had been lent to that ship, and who were taken ill after their return. Of these, a few of the worst cases were sent to the hospital, and two died on board, who, with one that died the preceding month, make the whole mortality of this ship, since leaving England, amount only to the loss of three men.

There has been little or no increase of scurvy this month; for though the numbers put on the list appear to be greater, the mortality is much less. It may indeed appear a matter of surprise

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hospital, and it appears, that, during ten months out of the twelve, the dysentery was the predominant disease. This seems to contradict the opinion, that the land air is more apt to occasion fevers than fluxes; but it is to be remarked, that the sickness of the soldiers on this island was not so much owing to the malignant influence of the air, the situation of the garrison being high and airy, as to the bad accommodations and provisions, together with hard labour.

that there should have been any scurvy at all, considering that the greater part of the fleet was at anchor all this month. But as this was the greatest fleet that had ever visited Jamaica, it was impossible to find fresh provisions for the whole; and the small supply they had did not amount to one fresh meal in a week. Port Royal is also remote from the cultivated part of the island, so that fruit and vegetables were both scarce and high priced, particularly this year, on account of the usual rains in May and June having failed. There was, however, an allowance of fresh provisions and vegetables made to the sick by public bounty; for as the hospital could contain but a small proportion of the sick and wounded, an order was given for the supply of fresh meat, fruit, and vegetables, to the sick, and five hundred pounds of Peruvian bark were also distributed as a public gratuity, besides sugar, coffee, and wine.

With these aids, and the various good articles of victualling from England, the fleet was preserved uncommonly healthy for a West-India campaign: for though the mortality had increased considerably during our stay at Jamaica, yet the loss of men, upon the whole, was small, compared with that of other great fleets in this climate on former occasions. The greatest squadron, next to this, that had ever been on this station was that under Admiral Vernon in the year 1741, at the same season. From this fleet upwards of eleven thousand men were sent to the hospital in the course of that and the preceding year, of whom there died one in seven, besides what died on board of their own ships

and in two hospital ships<sup>17</sup>. The disproportion of sickness in the two fleets will appear still greater, when it is considered that Admiral Vernon's contained only fifteen thousand seamen and marines<sup>18</sup>; whereas that under Lord Rodney contained twenty-two thousand. What added to the sickness of the former was the unfortunate expedition to Carthagen in April, 1741; to which probably it was owing that a much greater proportion of yellow fevers were landed from the fleet at that time than from ours, as appears by the papers left by Mr. Hume, who was then surgeon of the hospital. The hospital was then at a place called Greenwich, on the side of the bay opposite to Port Royal, and was very large; but it was found to be in a situation so extremely unhealthy, that it was soon after abandoned and demolished, and the hospital has since been at Port Royal.

It appears by the tables, that a greater number was put on the list under the head of *other complaints* in this month than the last. This was owing to the great number of ulcers which I have remarked to keep pace with feverish as well as scorbutic complaints; for when the constitution of the air is favourable to disease, or the habit of body prone to it, wounds and sores are found then to be more difficult of cure. There were twelve deaths besides those occasioned by what have been called the three epidemics. Of these, five perished by drowning and other

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<sup>17</sup> See Essay on the Yellow Fever, by Dr. Hume, in a Collection of Essays published by Dr. D. Monro.

<sup>18</sup> Campbell's Lives of the Admirals, Vol. IV.

accidents, three died of ulcers, one of wounds received in action, one of *cholera morbus*, and one of an abscess.

It has appeared that very few ships of this numerous fleet preserved their health while lying at anchor; and it would seem that short and frequent cruises are very conducive to health. It was eleven weeks from the time that the first of our fleet came to anchor at Jamaica till the main body of it sailed for America on the 17th of July. Great fleets are in time of war under the necessity of being at one time longer at sea, and at another time longer in port, than is consistent with the health of the men, the ships being obliged to act in concert and to co-operate with each other. This is one reason, among others, for ships of the line being more sickly than frigates. As ships of war must be guided by the unavoidable exigencies of service, it would be absurd to consider health only; but if this were to be the sole object of attention, a certain salutary medium could be pointed out in dividing the time between cruising and being in harbour; and it is proper that this should be known, that regard may be had to it, as far as may be consistent with the service. I would say, then, that in a cold climate men ought not to be more than six weeks at sea at one time, and need not be less than five weeks, and that a fourth part of their time spent in port would be sufficient to replenish their bodies with wholesome juices. In a warm climate men may be at sea a considerable time longer, without contracting scurvy, provided they have been under a course of fresh and vegetable diet when in port.

Though contagion is not so apt either to arise or to spread in this climate as in colder ones, there were several circumstances about this time tending to prove that it may exist in a hot climate. Those ships which had their men returned to them from the French prizes, in all of which fevers prevailed, had an increase of sickness not only in the men that were returned, but in the rest of the crew. There was another presumption of contagion, from the proportion of mortality among the surgeons and their mates, who were by their duty more exposed to the breath, effluvia, and contact of the sick. There died, during our stay at Jamaica, three of the former, and four of the latter, which is a greater proportion than what died of any other class of officers or men.

It has been the opinion of some, that fevers do not arise from any putrid *effluvia*, except those of the living human body, or some specific infection generated by it while under the influence of disease. It has been alledged in proof of this, that the putrid air in some great cities is breathed without any bad effects; and a celebrated professor of anatomy<sup>19</sup> used to observe, that those employed in dissecting dead bodies did not catch acute diseases more readily than other people. I believe this may be true, in a climate like Europe, where cold invigorates the body, and enables it to resist the effects of foul air; but I am persuaded it is otherwise in tropical climates. The external heat of the air induces great languor and relaxation, and we cannot breathe the same portion of air for the same length of time in a hot as in a cold climate,

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<sup>19</sup> The late Dr. William Hunter.

without great uneasiness. The want of coolness must, therefore, be compensated by a more frequent change of air, and by its greater purity: any foulness of the air is accordingly more felt in a hot climate; and, according to the modern theory, air, already loaded with putrid phlogistic vapour, will be less qualified to absorb the same sort of vapour from the blood in the lungs, in which, according to this theory, the use of respiration consists. Be this as it will, there is something in purity of air which invigorates the circulation, and refreshes the body; and the contrary state of it depresses and debilitates, particularly in a hot climate; and in this way foul air may induce disease, like any other debilitating cause, independent of infection, or any specific quality. There was no reason to suspect any such infection in the *Ville de Paris*; for there was no sickness on board of this ship when in possession of the enemy, and the sickness that prevailed after her being captured seemed to proceed from what may be called simple putrefaction. There was an instance of the same kind in one of our own ships of the line, in which a bad fever broke out in the beginning of July, which seemed to be owing to the foul air of a neglected hold; for there was a putrid stench proceeding from the pumps, which pervaded the whole ship. I perceived this very sensibly one day, when visiting some officers who were ill of fevers; and before I left the ship an alarm was given of two men being suffocated in what is called the *well*, which is the lowest accessible part of the hold. This fever was of a very malignant kind, and fell upon the officers more than the men; for six of them were seized with it,

of whom three died on the third day after being taken ill.

The fevers, which were of the greatest malignity at this time, affected the officers more than the common men. Only one captain died at Jamaica while the fleet was there, and it was of this fever. We lost five lieutenants, of whom four died of it; and this was the disease which carried off the three surgeons. But foul air was not the only cause that produced this fever among the officers, several of whom brought it on by hard drinking, or fatiguing themselves by riding or walking in the heat of the sun. It cannot be too much inculcated to those who visit tropical countries, that exercise in the sun, and intemperance, are most pernicious and fatal practices, and that it is in general by the one or the other that the better sort of people, particularly those newly arrived from Europe, shorten their lives.

Before leaving Jamaica, I sent to England a Supplement to the Memorial given in, last year<sup>20</sup>.

## CHAP. V

Account of the Health of the Fleet, from its leaving Jamaica on the 17th of July, till its Departure from New York on the 25th of October. – What Diseases most prevalent on the Passage to America – Rapid Increase of the Scurvy during the last Week of the Passage – Method of supplying the Sick at New York – The Fleet uncommonly

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<sup>20</sup> [See Appendix to Part II.](#)

healthy in October – State of the Weather and of Health in America in Summer and Autumn, 1782.

The season of the hurricanes approaching, and all the convoys destined for England this year being dispatched, the main body of the fleet, consisting of twenty-four ships of the line, left Port Royal on the 17th of July, under the command of Admiral Pigot, in order to proceed to the coast of America. A great convoy for England had been sent off a few days before, protected by the Ville de Paris and six other ships of the line, which we overtook and passed at the west end of the island. When we arrived off the Havannah, a large squadron of the enemy was seen there in readiness to sail, which induced the Admiral to wait in sight of it for the convoy, which did not come up till ten days after. Owing to this delay, and our meeting with baffling winds on the rest of the passage, we did not arrive at New York till the 7th of September. We found there the Invincible and Warrior, which sailed after us, but arrived before us, by having taken the windward passage.

### **Table, shewing the proportional Prevalence of different Diseases, and their Mortality, in July, 1782**

Transcriber's Keys:

A Proportion of those taken ill in the Course of the Month.

B Proportion of Deaths, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	13½	16
Fluxes	24	49
Scurvy	91	0
Other Complaints	20	134
General Proportion	5½	33

The mortality this month, in relation to the whole numbers on board, was one in a hundred and thirty.

There were only one in thirty-eight of the sick sent to the hospitals.

The fevers arose chiefly during the first two weeks after leaving Jamaica, which renders it probable that the seeds of them were brought from thence. Had they been owing to the heat simply, they would have been as apt to arise in some subsequent part of the passage; for the tropical heats at this season of the year extend to the 30th degree of latitude, which we did not cross till the 22d of August, that is, near five weeks after leaving Jamaica. The only ships in which the fever could be imputed to infection or foul air were the *Barfleur*, *Alcide*, and the *Aimable* frigate. The first had received, as recruits, at Jamaica, men who had been confined for some time before in a French jail, and a fever of a bad kind spread on board of her soon after. The *Aimable* was a prize from the French; and the sickness was here so evidently owing to foul air, that, whenever the contents of the hold were

stirred, so as to let loose the putrid effluvia, there was then an evident increase of sickness. The fever in the Alcide was of a peculiar slow kind, to be described hereafter, and seemed to be a continuation of the same infection which had so long existed in that ship.

The Duke, which had hitherto been by far the most subject to fevers of any ship in the fleet, became more and more free from them even in the most early part of this passage, and might be said to be entirely so at the time she arrived in America. The fever had been so very prevalent in this ship since leaving England, that there was hardly a man who had escaped it. Could this have any effect in making them less liable to catch it a second time?

In the course of this passage the dysenteries came to prevail over the fevers, as we have found to be commonly the case at sea. It appears by the former table, compared with the next, that the mortality in fevers was much the same, and that in the dysentery it was greater than while the fleet was at Jamaica. This does not argue, however, that the diseases were equally malignant, but was owing to the want of an hospital, and of those comforts of diet which the sick enjoyed on board while in harbour. This last was particularly felt in the dysenteries, in the cure of which more depends upon diet than in most other diseases. In all the calculations of mortality on board of ships, if any have been sent to the hospital, they are to be deducted from the number; and these make a greater difference in the mortality on board than their numbers simply would indicate; for only the worst cases,

and those therefore who were most likely to die, used to be sent to the hospital. But as the fleet was at sea during the whole of this month, no allowance of this kind is to be made.

## **Table, shewing the proportional Sickness and Mortality in August**

Transcriber's Keys:

A Proportion of those taken ill in the Course of the Month.

B Proportion of Deaths, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	31	17
Fluxes	46	35
Scurvy	25	66
Other Complaints	27	43
General Proportion	7½	31

The mortality this month, in relation to the whole numbers on board, was one in one hundred and sixty-nine.

The scurvy began to appear very soon upon this passage; for by the end of August, at which time the fleet had only been six weeks at sea, and that in a warm climate, and in dry weather, it had made considerable progress. It first appeared and prevailed most in the Prince George and Royal Oak, though they had been

ten weeks at Jamaica. This was the first sickness with which the latter had been affected since arriving in the West Indies; and there was no perceivable peculiarity in either of them to account for their being subject to it more early, or more violently, than the rest of the fleet. If the disease is contagious, as has been suspected, there might be a few men on board of them, who, being uncommonly prone to the disease, would be soon affected, and communicate it, or at least hasten the symptoms in those who might be less predisposed to it. But this is only conjecture. Before the end of the voyage, the whole fleet was more or less afflicted with it, though it had been only seven weeks and three days at sea; but the men had received so few refreshments while in port, that their constitutions were prepared to fall into this disease. The *Barfleur*, *Alfred*, and *Princessa*, were most affected with it next to the two ships mentioned above.

The seventeen ships which arrived from England in February and March were much less affected with it than the rest of the fleet, which was, no doubt, owing to the wine, melasses, and sour krout, with which they were so amply supplied. Though these articles were all expended before leaving Jamaica, yet the good effects of them on the constitutions of the men were visible in the course of this passage.

The *America* was the most free from it of all the ships of the old squadron; and this was owing to the great humanity and attention of the captain<sup>21</sup>, who, as soon as any of the men

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<sup>21</sup> Captain Samuel Thompson.

were taken ill, allowed them wine and other refreshments from his private store. There was another proof in the Conqueror of the great importance of attending to this disease in its earliest stage. Mr. Lucas, the surgeon of this ship, by watching the first beginnings of it, by a proper regulation of diet, and the administration of the essence of malt and juice of limes, not only prevented the progress of the disease, but proved, that, with great attention, it may even be cured at sea. It is of the utmost consequence in this disease to put the men on the sick list on the very first appearance of the symptoms, so that they may early have the advantage of proper treatment and regimen. It is only at this period of it that the effects of essence of malt are sensible; but we have seen that the juice of certain fruits will cure it in more advanced stages.

There is a very important remark suggested by comparing the two preceding tables with that which follows. It appears that in the month of September a much greater number was taken ill of scurvy, and also that there died of this disease a greater proportion than in the two preceding months. All the mischief from it in that month happened in the first week of it, during which as many died as in the whole month of August; for the fleet came to an anchor on the 7th of September at New York, where the worst cases were immediately sent to the hospital, and those that remained on board were supplied with every necessary refreshment. Had the fleet remained longer at sea, the mortality would probably have increased in the same progression; and this

circumstance ought to be well considered in undertaking cruises.

## Table, shewing the proportional Prevalence of Sickness and Mortality in September

Transcriber's Keys:

A Proportion of those taken ill in the Course of the Month.

B Proportion of Deaths, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	49	31
Fluxes	46	68
Scurvy	15½	39
Ulcers	68	0
Other Complaints	62	226
General Proportion,	7	58

The proportion of deaths, in relation to the whole numbers on board, was one in three hundred and ninety-eight.

About one third of all the sick were sent to the hospital.

As the proportion of ulcers was uncommonly great, I thought it worth while to make a calculation of it. The Barfleur had the greatest number; and this ship, for causes I cannot assign, was more afflicted with bad ulcers than any other in the fleet, for several months together.

The fleet having arrived at New York in this unhealthy state, the first care was to make provision for the sick. There were somewhat more than fifteen hundred on the sick lists of all the ships, and the hospital could accommodate little more than six hundred. In order that it might not be overcrowded, and that each ship might have a just share of relief, I went round the fleet to ascertain the due proportion of those cases that were the most proper objects for being sent on shore. All the infectious and acute Complaints, and some of the worst scorbutics, were accordingly sent to the hospital. Those who were kept on board being chiefly such as were affected with the scurvy, were supplied with various refreshments in their respective ships, and seemed to recover as soon as if they had been sent on shore. They had indeed almost every advantage enjoyed by those at the hospital; for, besides fresh meat thrice a week, and spruce beer daily in common with the other seamen, each man on the sick list was supplied every week at the public expence with four pounds of apples and half a pound of sope. There were also thirty casks of limes taken in a prize, which were distributed among the scorbutic men, and proved of infinite use. Admiral Pigot's great zeal for the good of the service, as well as his natural humanity, induced him to listen to whatever was proposed for the benefit of the men.

The supply of sope was a thing entirely new in the service; but the good effect of all the other articles would most probably have been defeated, unless the men had been furnished with the means

of cleanliness, which is the most essential requisite of health. The advantage of this method will appear by the returns of next month to have been very conspicuous; and it was on this occasion more than any other that I saw realised in every particular the plan proposed in the memorial to the Admiralty. It may be added, that the sick that were left on board were not even without the recreation of the shore enjoyed by those at the hospital; for most of the captains had the attention to send daily on shore, for amusement and exercise, such as were able to walk. Thus there were all the advantages of an hospital obtained at much less expence to Government, and without the risque of intemperance, desertion, or infection, which are the inconveniencies connected with an hospital. What farther contributed to health at this time was, a large quantity of excellent wine with which the fleet was supplied.

### **Table, shewing the proportional Sickness and Mortality in October**

Transcriber's Keys:

A Proportion of those taken ill in the Course of the Month.

B Proportion of Deaths, in relation to the Numbers of the Sick.

DISEASES.	A	B
	ONE IN	
Fevers	45	250
Fluxes	61	69
Scurvy	34	197
Ulcers	181	0
Other Complaints	127	0
General Proportion	12½	196

The proportion of deaths in this month, in relation to the whole number on board, was only one in fourteen hundred and seventy-eight.

About one in twenty-nine of the sick was sent to the hospital.

There was, upon the whole, less sickness and mortality in this month than in any other during which I kept records of the fleet. This was, no doubt, owing in part to the climate, but was chiefly the effect of the extraordinary attention paid to the refreshments of the men. The fleet was here exactly in the same situation, and at the same season, two years before, but was not near so healthy.

Nor were the advantages derived from the great plenty of refreshments, procured at this time at New York, merely temporary; for the men's constitutions were so much improved by them, that the part of the fleet which remained under the command of Lord Hood was at sea for twelve weeks without being affected by the scurvy. This was chiefly to be ascribed to the previous refreshments; for we have seen, that, in a passage of seven weeks from Jamaica to New York, the fleet was greatly

affected with the scurvy, in consequence of not having had the advantages of fresh meat and vegetables when last in port. The climate had, no doubt, also a share in keeping off the scurvy; for the greater part of the twelve weeks was taken up in a cruise off St. Domingo; and, I believe, it never was known that a fleet was so long at sea, in a cold climate, without being greatly affected with this disease.

It appears, that though the proportion of fevers had increased somewhat this month over that of fluxes, yet the former were less fatal; and, I think, the true dysentery is more frequent in this climate, and more apt to prove fatal in its acute state, than in the West Indies. I have indeed preferred the term flux to that of dysentery, for this reason, that the symptoms in many cases did not rise so high as properly to constitute dysentery; and the disease proves fatal in the West Indies more frequently in the chronic than in the acute state. The fluxes were daily gaining ground when we left New York, and continued to prevail to a great degree in the Magnificent, which remained in that climate several weeks after us.

The climate and situation of the fleet had a greater effect in diminishing ulcers than any other complaints; for the proportion of them in this month is little more than one third of what it was in the last.

The calculation for October was made upon thirteen ships of the line, which sailed from New York on the 25th of that month. The weather had then begun to grow cold; but few or

none of the diseases peculiar to a cold climate had appeared. There occurred, while we were at New York, several cases of inflammation of the liver among the officers and men who came from the West Indies. It was remarked formerly, that this complaint hardly ever occurred in the West Indies; but it would appear that the residing there disposes to an inflammation of this organ upon changing to a colder climate.

The preceding summer had been uncommonly cold, not only in North America, but in the whole temperate part of the northern hemisphere, so far as I could learn by inquiry. In consequence of this, the crops failed in Europe, America, and the northern parts of Asia. The same circumstance had a remarkable effect on the reigning diseases of the season at New York; for, instead of the bilious complaints common in the end of summer and in autumn, a slight fever of the inflammatory kind had prevailed. An epidemic catarrh had spread all over Europe, and some part of Asia, in the earlier part of the year; and perhaps this was connected with the peculiar state of the atmosphere about this time. It was before observed, that there was something unusual in the state of the weather at Jamaica while the fleet lay there; and it is possible that this might be owing to the same general cause.

## CHAP. VI

Account of the Health of the Fleet from its Departure

from New York till the Conclusion of the War. – Passage to the West Indies – Account of the Ships there during our Absence – Arrival of a Squadron from England – Of these, two Ships only were healthy – Causes of this – Inflammatory Complaints in the Union – Probable Cause of these – Comparison of the two Squadrons – Increase of Sickness from Recruits brought from England – from French prisoners.

Thirteen ships of the line sailed from America for the West Indies on the 25th of October, under the command of Admiral Pigot, and the other half of the fleet was left under Lord Hood, to watch the motions of the French squadron, which was then at Boston.

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