V

AN

ESSAY

ON THE

CAUSES and CURE

OF THE

USUAL DISEASES,

IN

VOYAGES to the WEST-INDIES.

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VOYAGES to the WEST-INDIES:

Together with

The PRESERVATIVES againſt them.

In anſwer to the Queſtions propoſed by the Society of Sciences in Holland;

What are the Cauſes of the uſual Diſeaſes among Seamen in Voyages to the Weſt-Indies? and, *What are the Means of preventing, and of curing them?*

To which ESSAY the PRIZE was adjudged.

Written by

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PREFACE.

THE Queſtion, *What are the Cauſes of the Diſtempers uſual in Weſt-India Voyages, with the Preſervatives from, and Cure of them?* having been propoſed by the Society of Sciences in Holland; it immediately appeared to me, that moſt, if not all, of my medical countrymen, however diſpoſed to inhance their reputation by aſpiring to the Prize, which the patriotic munificence and wiſdom of that Society have annexed to the moſt uſeful, and practical

ſolution of theſe important Queſtions, would be deterred from ſuch an attempt, notwithſtanding this inducement, as having little or nothing to produce, from their own experience and obſervation, on the ſubject; and from their being, if not totally ſtrangers to navigation; yet, little acquainted with the many changes and effects, which living at ſea, and ſailing into different climates, very generally produce in the human conſtitution.

With regard to a majority of the ſurgeons of our Weſt-India ſhips, it was a doubt with me, whether any thing conſiderable was to be expected from them on this head: For, however expert they might be in the uſeful and operative art which they profeſs; yet

yet it is ſeldom found that they have applied themſelves to acquire a fundamental and ſolid knowledge of medicine: and ſtill leſs have they attained to thoſe improvements, requiſite to a full and clear ſolution of the Queſtion propoſed.

What farther confirmed me in this opinion, was, that not one of the Anſwers, which had been ſent to the Society the firſt year, had been judged ſatisfactory, at the general meeting held for the examination of them.

A want of experiments of my own making, and authentic accounts of this during the firſt year, reſtrained me from hazarding a treatiſe on the ſubject; and no ſmall part of the ſecond was elapſed, when, after having long and

cloſely ruminated on it, I became convinced, that the Queſtion might be effectually anſwered, by ſimply conſidering the diſtempers in the Torrid Zone, as not different from thoſe, which prevail in our Autumns; and, at the ſame time, making uſe of the many obſervations of the Engliſh Phyſicians and Surgeons, who, at preſent, to the great benefit of that commercial nation, make the Sea-diſtempers a conſiderable object of their ſtudy, and have written on them from their own experience.

Animated by this reflection, I began to try how far an experience of ſeveral years, in diſtempers of that claſs (1), and the moſt exact

(1) For this I had the moſt favourable opportunity during my four years ſervice, as Phyſician to the auxiliaries of this ſtate, both in Germany and the

enquiries

enquiries I could make, would enable me to give any conſiderable ſatisfaction on this important point.

In order to this, I firſt carefully peruſed many Engliſh writers, eſpecially thoſe of the greateſt repute, and the moſt recent, as Mead, Pringle, Huxham, Lind, Watſon, Biſſet, Hillary; perſons of the higheſt eminence for medical and chirurgical knowledge; and, on ſome of theſe I beſtowed a ſe-

Low-countries: And eſpecially as, for a great part of the time, the celebrated Dr. Pringle attended the Engliſh troops in the confederate army, both in that quality, and as body-phyſician to his Royal Highneſs the Duke of Cumberland; from the faithful diſcharge of which honourable ſtations he was enabled to write his ineſtimable treatiſe *On the ſickneſſes of an army in camp, and in garriſon*, as they came under his obſervation in the different ſeaſons of the year: In which treatiſe he lays open the cauſes of putrefaction, the remedies againſt, and the preſervatives from, that terrible deſtroyer, with a clearneſs and accuracy, that has extended his reputation throughout the republic of medicine.

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cond reading, with equal attention.

This was of ſo much advantage to me, that to have added ſuch ample quotations of all their accounts and reflections, as correſponded with my own; or to ſpecify the many particulars I have borrowed from thoſe valuable Authors, would have been tedious.

I have, likewiſe, had not a little converſation with maſters of ſhips, long employed in the Weſt-India trade, and other perſons who have occaſionally viſited thoſe parts, ſome of whom have very lately returned; and with all of theſe I was very circumſtantial in my queſtions, concerning the ſymptoms, events, and other particulars of the diſeaſes moſt frequent among ſea-faring people.

In

In my enquiries, I was alſo not a little aſſiſted by a very judicious Engliſhman of my acquaintance, who had been four years and a half in the Weſt-Indies, on the coaſt of Guinea, and at Barbadoes, a fine iſland belonging to the Crown of Great-Britain.

Laſtly, a very conſiderable perſon, a Lord of the Admiralty of that Nation, but whoſe titles are the ſmalleſt part of his merit, condeſcended to procure me, from the Office for taking care of ſick and wounded ſeamen, a very preciſe anſwer to ſome queſtions, which his courteſy had encouraged me to lay before him.

Theſe are the aſſiſtances to which, without over-rating my own little acquaintance with the prevailing diſeaſes in Weſt-India-

men,

men, I have had recourſe; and, beſides the decency of acknowledging obligations, this detail of them will not detract from whatever weight my following endeavours, on this topic, may carry with them.

I ſhall firſt, though very conciſely, give an account of the Dutch Weſt-India ſettlements, and the temperature of the air under the Torrid Zone; together with ſome of the principal facts and circumſtances, incident and relative to thoſe parts; all which I have collected partly from the beſt naturaliſts, and partly from narratives, for which I have been obliged to ſome perſons, whoſe attention has not been wholly engroſſed by mercantile views, and an avidity of lucre.

With

With theſe I thought I might reſt ſatisfied; ſince, if I were to detail all the obſervations which I had collected and conceived on the ſubject in queſtion, this diſcourſe would have been of an improper length, and have taken up too much time, as well as room, among the very good company into which it has the honour of being received. Whoever is deſirous of a more particular acquaintance with thoſe principles and obſervations which I have borrowed, may gratify himſelf by peruſing the Authors ſpecified in the ſeveral pages, with exact references to all the paſſages I have cited, or had in view.

I ſhall farther ſubjoin an account of the ſeamen's diet on board

board our men of war, as communicated to me by a Sea-captain; and laſtly deſcribe the diſtempers moſt common on board ſuch ſhips.

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in the WEST-INDIES.

CHAP. I.

Of the ſituation of the Weſt-Indies.

I. BY the WEST-INDIES, improperly ſo called, is generally underſtood all America; but the Queſtion propoſed by the Honourable Society, to which our country already owes many ſignal benefits, and very uſeful improvements, relates only to thoſe parts of it

which are under the dominion of the States of the United Netherlands, and which are the ſcene of that Commerce under the direction of the Weſt-India Company.

II. The principal of thoſe ſettlements are;

1. ST. EUSTATIUS, a ſmall iſland, and one of the Caribbee, or Antilles iſlands, lying in 17 deg. 25 min. north latitude, and (1) 314 deg. 25 min. longitude, computing from the Pike of Teneriff.

The whole iſland is little more than one ſingle mountain, which, towards the middle, riſes in the figure of a ſugar-loaf: Nevertheleſs its trade is far from inconſiderable.

2. CURAÇOA, alſo an iſland, to the northward of the province of Venezuela in South-America, lies in 12 deg. 25 min. north latitude, and 348 deg. 30 min. longitude: In ſome places, particularly about the port, it lies low, but the parts inhabited by the Caribbeans are high and

(1) The longitude of all theſe places mentioned here is eaſt-longitude, by which ſome other nations account; and theſe being deducted from 360, the number of all the degrees on the globe, the remainder is their weſt-longitude from Teneriff.

unequal:

unequal: Its trade is more extenſive and valuable than that of the former(1).

3. ESSEQUEBO, in ſix deg. 45 min. northern latitude, and 318 deg. 55 min. longitude.

4. BERBICE, in ſix deg. 18 min. north latitude, and 320 deg. 30 min. longitude.

5. SURINAM, ſituated in five deg. 55 min. north latitude, and 322 deg. 30 min. longitude. The territory and dependencies of it, in the province of Guiana, on the eaſtern coaſt of South-America, commonly known by the name of the Caribbee coaſt, and extending itſelf from the great river of the Amazons to the river Oroonoke, in a ſpace of full 200 German miles, conſiſts of a low country, covered with woods, and the greateſt part of it overflowed, during three-fourths of the year, to the height of one, two, or more feet; at leaſt, within the diſtance of ſome miles from the rivers.

6. To theſe may be added ST. GEORGE DEL-MINA, on the north-weſt coaſt of

(1) Dutch magazine, vol. iii. piece iii. p. 91. from Titzing's ſea-ſurgeon.

Guinea, lying in five deg. four min. north latitude, and 17 deg. 30 min. longitude, the country hilly and woody (1).

CHAP. II.

Of the temperature in the torrid Zone.

III. THE heat between the Tropics, eſpecially at noon, in the before-mentioned countries and at ſea, though leſs intenſe in the latter than the former, is greater, more equal, more ſettled and durable than with us (2); yet is the dif-

(1) Hiſtorical account of voyages and travels, vol. V. p. 474.

(2) Muſchenbroek's elements of natural philoſophy, p. 879.

Diſeaſes of the army in camp, by John Pringle, M. D. part iii. chap. iv. p. 254.

Lulofs mathematical and phyſical ſurvey of the globe, p. 589.

Meteorological obſervations at Curaçoa by M. Doerfel, publiſhed in the fourth volume of the tranſactions of the Haarlem ſociety.

Barometrical and thermometrical journals at Surinam, vol. i. of the Dutch magazine.

Preſent ſtate of all nations, vol. xi. p. 544.

Hiſtorical account of voyages and travels, vol. V. p. 473.

Dutch magazine, vol. i. p. 24.

Titzing, l. c. p. 225. 227. 309.

ference

ference not ſuch, as at firſt would be imagined; for, according to M. Coſſigny's obſervations (1), not ſo much as any one particular day there equalled the heat of many of the ſummer days at Paris; and that eminent philoſopher and mathematician M. Lulofs calculates the whole heat of a day during the Æquinox, and under the equinoctial, when the ſun is directly perpendicular, compared with the whole heat of the longeſt day at Leiden; and makes the difference no more than as 73 to 80 (2). The length of the nights contributes to make them very cool there, and eſpecially towards the approach of morning (3).

The difference between the heat of the day and that of the night, particularly

(1) Lulofs, p. 590. from the memoirs of the Academie des Sciences, A. D. 1738, p. 539—1739, p. 610. 1742. p. 841.

(2) Idem, p. 591.

(3) Muſch. p. 879. 896.

Lulofs, p. 592.

Dutch magazine, vol. i. p. 16.

Titzing, p. 22. 309. 387.

Hiſtorical Account of travels and voyages, vol. V. p. 403, 473.

at Surinam (1) is generally of 8, 10, or 12 deg. on Fahrenheit's thermometer. The diverſity of the heat between the morning and noon is ſometimes ſo minute as to be within one degree, but is much more frequently 16 deg. and a half. The greateſt degree of heat riſes to 88 or 90, and the leaſt is 72.

This is conſiderably applicable to the other countries (2), although the difference is rather leſs obſervable in them.

IV. The winds in theſe climates are, at ſea, the general trade winds; and, along the coaſts, the land and ſea breezes.

The trade-wind is always eaſt, with ſometimes a point or two to the north, or ſouthward. When the wind is E. N. E. between the tropics, and the ſun in the ſouthern ſigns; the air, to the extent of 28 deg. north of the Æquator, is clear, with very fine weather; but, on the contrary, if the ſun be in the northern ſigns, the weather is thick and ha-

(1) Barometrical and Thermometrical journal at Surinam. Dutch magazine, vol. i. mem. 1.

(2) Dutch philoſophical tranſactions, vol. iv. p. 315.

zy, with ſudden ſqualls, eſpecially near the Æquator. This wind alſo prevails moſt in the rainy ſeaſon (1).

The ſea and land breezes are cool and refreſhing in hot climates, though ſometimes irregular (2).

The ſea-winds are moſt regular in fair weather; but, in the wet ſeaſons, they are frequently known to fail for a day (3).

The land-winds are ſtrongeſt in gulphs and large bays; and colder than the ſea-winds, though more moderate.

The land breeze, at Surinam, is ſome points to the ſouthward; and being, in its courſe, over a large ſwampy, and frequently overflowed tract of country, charged with aqueous particles, it is far from being hot.

At Curaçao the nights may be ſaid to be ſharp; they are alſo frequently damp and windy; but, in ſome parts of the iſland more ſo than in others.

(1) Muſch. p. 784. 867. 868. 870. Dutch magazine, vol. i. p. 5.

(2) Muſch. p. 484.

(3) Muſch. p. 879.

V. With regard to the moiſture of the air, it may, in general, be obſerved, that in the beforementioned parts, both on the ſea and land, it commonly much exceeds the uſual humidity of our air (1).

If the miſts exhaled from the ſea by the greater heat of the ſun, are purer than thoſe from the land, they are alſo more frequent, and eſpecially about the Æquator (2).

Putrid and noxious effluvia riſe in very groſs and thick vapours from the vallies, from ſtagnant and ſhallow pools, or fens, eſpecially after heavy ſhowers, and the laſting and exceſſive heat, which ſucceeds ſuch rains (3).

According to obſervations made at Surinam, the exhalations abound moſt re-

(1) Muſch. p. 794.

Pringle, part i. chap. vii. p. 71. Part iii. chap. iv. p. 236.

Lind's treatiſe of the ſcurvy: Edinburgh 1753, in octavo, part ii. chap. i. p. 108. 114.

Biſſet's treatiſe on the ſcurvey: Lond. 1755, p. 3, 18.

Titzing, p. 253.

(2) Muſch. p. 429. 484. 785.

Pringle, part i. chap. i. p. 1--4.

(3) Idem. part i. chap. i. p. 2. 6. part ii. chap. ii. p. 99. 101. 103.

markably

markably in the months of April, May, June, and July. Thoſe of the year 1744 amounted to 44 inches (1).

The dews, likewiſe, in thoſe parts, are very copious, in a ſtill evening and in the night; and at ſeven in the morning they are ſtill ſo thick, that they may not very improperly be called a miſt or fog (2).

Beſides the almoſt continual hazineſs of the air here, occaſioned by the two preceding circumſtances, it is ſubject to frequent and heavy rains. A maſter of a ſhip, lately come from St. Euſtatius, told me, that in rainy weather, a cloud is always ſeen hanging over the peak of its mountain, which has alſo been obſerved in not a few parts of Europe. In the countries between the Æquator and the Tropics it rains for ſix months in-

(1) Dutch magazine, vol. i. firſt piece in the meteorological obſervations at Surinam.

(2) Lulofs, p. 597.
Hiſtorical account of voyages and travels, vol. V. p. 403.
Titzing, p. 256.
Dutch magazine, vol. i. piece 1ſt. p. 6.

ceſſantly,

ceſſantly, and moſt, when the ſun is in the Zenith (1).

In the gulph of Guinea the S. W. wind propels all the clouds, formed by marine exhalations; which float along the ſouth coaſt of Africa towards the land, and being compreſſed by them againſt the mountains, it frequently occaſions deluges of rain (2).

The continual eaſtern trade wind, likewiſe, where its impetuoſity is felt along the eaſtern coaſt of America, brings with it the like bad weather (3).

The height of the rain, which fell at Surinam, in the year 1744, taken collectively, ſomewhat exceeded thirty-two Rhynland inches: though it muſt be obſerved, that in the months of April, May, June, and July, a far greater quantity fell than in the other months (4).

(1) Muſch. p. 794.
Lulofs, p. 594---596.
(2) Muſch. p. 784.
(3) Ibid.
(4) Meteorological obſervations at Surinam, in the Dutch magazine, vol. i.

Mr.

Mr. Muſchenbroek, in caſting up the quantity of rain for ten years ſucceſſively at Utrecht, found it, at a medium, to be 24 inches (1).

The humidity of the air, however, is not determinable by the quantity of rain: the air at Curaçao, in dry weather, is ſo loaded with vapours, that at night, even when there are no clouds, very few ſtars are to be diſcerned; but, on the contrary, after a heavy rain, the air is clear enough to give a ſight of as many ſtars, as in a bright, froſty night in Holland (2).

It has alſo been obſerved at Curaçao, that in a time of little or no rain, and with the heat between 80 and 84 deg. ſuch was the moiſture of the air, that a (*) Notiometer, made in Holland, of a ſcale with a dried ſponge, (which had

(1) Muſch. p. 793.

(2) Titzing, p. 382.

Stockke Treatiſe, on the Gallſickneſs, or Bilious Fever, Utrecht, 1742. p. 23.

Pringle, part ii. chap. ii. p. 101, 102. part iii. chap. iv. p. 215.

(*) This ſignifies the ſame with *Hygrometer*, (*i. e.* a meaſurer of moiſture) the term commonly uſed by us for ſuch an inſtrument or contrivance.

been dipped in a lixivium of Sal Ammoniac) hanging to it, and its drought and humidity divided into 90 deg. required a weight of twice that gravity to be hung to it; and, another time, when ſcarce a day paſſed without rain, and the Thermometer ſtood between 82 and 86 deg. the air, at firſt, was ſomething more humid, but gradually became drier than in Holland (1).

Vapours and exhalations, driven by a land wind, ſeawards, are found ſalubrious or morbific, according to the quality of the ſoil, whether ſandy, gravelly, loamy, or marſhy (2): yet, the healthy ſtate of ſome Engliſh men of war, under the command of Commodore Mitchell, which lay at anchor in the channel between South-Beveland and the iſland of Walcheren, parts of the province of Zealand, in both which places the fever raged alike among the natives and the Engliſh ſoldiers cantoned there, is a proof that the moiſt and putrid airs of the waters, mud, and marſhes, was diſſipated or

(1) Titzing, p. 382.
(2) Pringle, part i. chap. i. p. 4.

corrected

corrected before it reached them; and, that a ſituation open to the wind, is one of the beſt preſervatives againſt the maladies of a neighbouring, low, and marſhy country (1).

VI. Both the preſſure of the atmoſphere, and the weather, is found to be more equal in hot countries, than in thoſe within the Temperate Zone, continuing nearly in the ſame ſtate for whole years ſucceſſively: for, between the Tropics, the alterations in the riſing and falling of the Barometer, are very inconſiderable (2). Beſides, the atmoſphere there is alſo more rarefied, and thus lighter, and leſs gravitating, than in countries of a higher latitude; as at the Æquator, the mercury is much lower than in France, and lower there than in Holland; and, here again, lower than in Sweden (3).

(1) Idem. part i. chap. vii. p. 71.

(2) Muſch. p. 643.

Dutch magazine, vol. iii. p. 24.

De la Condamine Mem. de l'Acad. des Sc. 1745. p. 571.

(3) Muſch. p. 705.

VII. The

VII. The air is generally more humid in ſhips than on ſhore, whether from the ſtagnated water in the bottom of the ſhip; or, from the ſurf, which, in ſtormy weather, is blown in like a mizzling rain; or, from the rain itſelf falling into the ſhip; or, laſtly, from the ſea-water penetrating through the ſeams of the ſides (1): However, between decks, the air is tolerably free and open, and more ſo in Weſt-Indiamen than in other voyages; but in that part of the ſhip, below the ſurface of the water, it is not only cloſe and ſultry, but charged with the nauſeous ſmoke of a multitude of candles, continually burning in all parts (2).

The air is moſt damp and confined in the fore-part of the ſhip, from the neceſſity of keeping the ports down, and generally more or leſs water finds a paſſage through the creviſes and apertures, however ſmall (3).

VIII. Laſtly, it is not unworthy notice, that, according to the obſervations

(1) Lind. part. ii. chap. i. p. 108--110. 114.
(2) Biſſet, p. 4. 7. 20. 23. 43.
(3) Idem, p. 20. 23. 43.

of

of many judicious travellers, particularly Feuillée, the ſea-water in the torid Zone is much more ponderous and ſaline, than in other parts; and, that it gradually freſhens in advancing northward (1).

Thus, as Mr. Lulofs juſtly obſerves, a wiſe and gracious Providence has, by a greater or a ſmaller quantity of ſalt, ſecured the waters from corruption, in proportion to their being expoſed to putrefaction, by a greater or a ſmaller heat.

CHAP. III.

Of the Diet of Seamen.

IX. THE following account of the diet of ſeamen on board a ſhip of war, was given me by a ſea-captain; and, in every point it agrees with the Admiralty order of the year 1636, except that, at preſent, the Iriſh fleſh, as being generally hard, dry, and ſalt, is diſuſed; and the ſhip's company, inſtead of it, are ſerved

(1) Feuillée journ. des. Obſ. tom. i. p. 19. 38, 63. 239.
Acta. Erudit. Lipſ. 1715, p. 189.

with

with bacon, though in a ſmaller quantity (1).

The ſhip's company have three meals every day; at half an hour after ſeven in the morning, at noon; and, at ſix, or half an hour after ſix, in the evening, according to the length of the days.

The breakfaſt is grout with beer, as long as the beer laſts; and afterwards with water and vinegar.

The dinner and ſupper conſiſt of peaſe and ſtock-fiſh, with butter and vinegar; except on Sundays and Thurſdays, when their dinners conſiſt of peaſe and hogs-lard, with half a pound of bacon to each man.

Every Monday each man has alſo half a pound of butter and a pound of cheeſe, as an allowance for the whole week. Their daily bread is without ſtint or allowance, each eating as much as he deſires. Neither are they ſtinted in the allowance of beer and water, except in caſes of indiſpenſible neceſſity; and on their being in a cold climate, a greater quantity of beer is naturally drank, and

(1) Preſent ſtate of all nations, vol. ix. p. 366.

more

more peaſe and grout eaten. But their allowances are varied, according to the voyage; as in beer, when a ſhip is got to the weſtward of Uſhant, the Captain may put the men to water only; but, to the northward, the Baltic, and down the channel, beer is conſtantly drank: But in theſe northern voyages, as they drink largely of beer, and eat more plentifully of peaſe and grout, they are put to an allowance of bread, from four to five pounds weight a week.

X. Being earneſtly deſirous of knowing, how far ſuch food is beneficial or hurtful to ſeamen, with regard to the diſtempers to which they are moſt ſubject, I have made ſeveral trials with, and many experiments upon, them; and herein I acknowledge, that I followed Dr. Pringle's method, in the experiments he made with other kinds of food, ſuch as are moſtly uſed by the Britiſh troops. I took ſeveral mixtures of the above-mentioned aliments, dreſſed in the ſame manner, and in the like proportion as iſſued on board our men of war; with ſome I mixed a certain quantity of hu-

man ſaliva, or ſpittle. Theſe mixtures I placed, during twelve or twenty-four hours, in a place whoſe heat was equal to that, by which concoction is promoted in the ſtomach.

By a cloſe attention to the different changes and appearances through which they paſſed, I obſerved the following effects, being the ſame which that learned and aſſiduous gentleman diſcovered by his experiments; whence they may be allowed to receive an entire confirmation from the many trials I have made.

1. That animal ſubſtances, as fleſh, fiſh, and bacon, being mixed with thoſe of the farinaceous kind, firſt contract a tendency to putrefaction in the above degree of heat (1).

2. That by this tendency to putrefaction, they are capable of exciting a fermentation in unleavened farinaceous ſubſtances (2).

3. That this fermentation will be produced, by uſing farinaceous ſubſtances

(1) Pringle, append. paper iv. exp. xxviii. p. 397.
(2) Idem, append. paper iv. exp. xxviii. p. 398. paper v. exp. xxxi. p. 401.

only;

only; but in a much more ſlow and more languid degree, than from the commixture of animal food or ſubſtances (1).

4. That the pouring water, beer, or vinegar, on thoſe mixtures, produces little or no difference in the fermentations.

5. That the fermentation ariſing from the mixture of farinaceous with animal ſubſtances, is productive of a ſtrong acid, which oppoſes, and totally prevents all further putrefaction (2).

6. That ſaliva, added to ſuch mixtures, retards the putrefaction of animal ſubſtances, abates the fermentation of farinaceous ones, and obtunds the points of the remaining acid (3).

(1) Pringle, append. paper iv. exp. xxviii. p. 397.
(2) Idem. append. paper iv. exp. xxviii.
(3) Idem. ibid.

CHAP. IV.

Definition of the uſual Diſeaſes.

XI. AS the queſtion propoſed limits our enquiry to the uſual Diſeaſes, I am firſt to examine which are to be conſidered as ſuch.

To this end I ſhall previouſly ſhew, which are not to be claſſed among them; whence it will appear, that ſome, for want of more knowledge and experience in the writers, have been reckoned ſuch, though, in reality, they have no affinity with them.

XII. Thus I exclude from the uſual diſeaſes, firſt thoſe which are ſeldom known in the Weſt-Indies; and ſuch are all real inflammatory diſeaſes.

1. Becauſe the temperature there (III. and V.) is not of a nature to cauſe them; and differs greatly from the quality of the air, which prevails in thoſe ſeaſons and countries where inflammations are moſt common; theſe being peculiar to the cold of winter and ſpring; and, as ſuch, viſibly decreaſe as ſummer advances.

This,

This, among other things, confirms the opinion of thoſe who have been converſant among camps in Europe, and have treated of diſeaſes in camp; and who all unanimouſly affirm, that in ſummer they have ſeldom met with a real pleuriſy; and, this, among the ſoldiery, a ſet of people ſo liable to real inflammatory diſorders (1): This truth is likewiſe farther aſcertained, by all the accounts which I have received concerning it; all declaring, that diſtempers of this kind are not uſual in hot countries.

2. As the nature of inflammatory diſorders differs from thoſe which prevail in hot climates, the types and ſymptoms of both are alſo different. All the ſymptoms in inflammations are conſequences of too great a tenſion and elaſticity of the fibres, and of an over-condenſed blood. A difficulty of breathing, ſweats, but

(1) To this I can ſubſcribe from my own obſervations when I ſerved in the army; and, on communicating this obſervation to ſome of my medical acquaintance, whoſe attention it excited, they afterwards acquainted me, that they alſo had experienced that diſtemper not to be ſo frequent in ſummer as it is generally believed.

ſeldom profuſe, and the *cruſta inflammatoria* or buffy ſuperficies of the blood when drawn and concreted, are the characteriſtic ſigns of them: but the very reverſe of all this is evident in the uſual diſtempers of a hot climate, as I hope manifeſtly to evince in the ſequel.

3. Hence alſo the method of cure in inflammations is directly oppoſite to the practice in ſummer diſeaſes, and thoſe which are moſt uſual in hot climates: in the former, the principal indication is to attenuate the blood, to abate its force and momentum, and to relax the fibres. Here then the uſe of emetics, and of the bark are extremely pernicious; but, that a contrary proceſs takes place in the laſt-named diſeaſes, the ſequel will demonſtrate.

Secondly, From the uſual diſtempers I exclude the Small-pox; which, indeed, are known to rage there with a moſt deleterious violence, ſweeping away multitudes, eſpecially before inoculation was introduced. This, however, cannot properly be ranked among the indigenous diſtem-

pers

pers of the Weſt-Indies, nor does it relate to the Society's queſtion.

Thirdly, Even ſome of the land diſeaſes, known in the Weſt-Indies, as the *Lues Venerea*, though imported into Europe from thoſe parts, does not come within the queſtion.

XIII. The Scurvy, indeed, is by moſt writers mentioned as prevailing much more in the northern, and cold, than in the hot climates; and, as ſuch, is foreign to this diſſertation: nevertheleſs, there being too frequent occaſion to account it a marine diſeaſe, eſpecially in long voyages; and, even in the torrid Zone: and, as its violence has been often very deplorable; and greatly increaſes the other uſual diſeaſes, with which both in the cauſes and remedy it has a remarkable affinity, I have thought this diſtemper may very properly be included among thoſe, which are the objects of the preſent diſquiſition.

XIV. For theſe reaſons I ſhall confine my examination to two *genera*, or ſorts of diſeaſes, one of a ſlow, the other of a haſty, progreſs. The former are the putrid

Fevers, which I again divide into bilious and malignant; whether primarily originated by an inherent cauſe in the conſtitution, or contracted from external contagion: of the ſecond ſort is the Scurvy.

XV. To the common putrid Fevers belong the ardent putrid Fever, the remittent and intermittent Fevers, the bilious Fever, the Diarrhœa, the Dyſentery, the Cholera morbus, the autumnal and ſummer diſeaſes, the yellow Fever, the black Fever, alias, the Chocolate or Coffee Sickneſs, &c.

XVI It has been the opinion of ſome, that the ardent putrid Fever belonged to the claſs of inflammatory diſtempers; though Hippocrates, by whom it is termed the Καῦσος, i. e. *febris ardens*, or burning Fever, places it among the ſummer diſeaſes; and never among thoſe of winter and ſpring.

Further, another difference between inflammatory and bilious putrid Fevers, and the others of that febrile claſs, is, that in hot weather, the former are more remittent, and the latter leſs.

Here

Here Huxham's remark (1) on Sydenham, both phyſicians of eminence, is very pertinent: 'Had Sydenham, ſays he, not 'treated all Fevers as merely inflamma-'tory, even the plague itſelf, his prac-'tice had been more univerſally juſt and 'imitable, as being extremely well adapt-'ed to all thoſe, that depend on an in-'flammatory lentor.' However, I very readily allow, that, in particular caſes, the putreſcent acid may be accompanied with a tenſion of the fibres, and poſſibly, at firſt, have more or leſs of an inflammatory diſpoſition. Hence it is, that in bilious fevers, at the cloſe of autumn, eſpecially if the weather be cold, a *cruſta inflammatoria* appears on the ſurface of drawn and coagulated blood.

XVII. But to ſome it may probably appear ſtrange, that I ſhould refer to the claſs of common putrid Fevers, ſuch different diſtempers as the Diarrhœa, Dyſentery, Cholera, yellow Fever, and Chocolate or Coffee Sickneſs, *&c.* But that I have not done this precipitately,

(1) Eſſay on Fevers by John Huxham: London 1757, in octavo, p. 100.

and

and without conſulting experience, will ſoon appear, on an impartial conſideration of the following particulars.

It has long ſince been the obſervation of many perſons, diſtinguiſhed by their medical talents, that the multiplying of diſeaſes, naturally the ſame, or only ſymptoms of, or acceſſory to others, and the various appellations by which they have been diſtinguiſhed, has at all times been an embarraſſment both to the ſtudy and practice of phyſic, and has obſtructed its improvement: as the tremendous catalogue of diſtempers, beſides the load it charges on the memory, is a diſcouragement to many, and muſt be finally productive of perplexity and confuſion.

Further, all the world knows, that one identical morbific cauſe, according to its different force, its different ſeat, the difference of conſtitution, climate, ſeaſon, and weather, produces ſymptoms, which, though they may differ widely in their external appearances, yet is the nature of the diſeaſe itſelf, as being the effect of one proximate cauſe, the ſame, and therefore requires the like method of cure.

XVIII. This,

XVIII. This, in my opinion, is applicable to the current ſea-diſtempers, and particularly to the common putrid Fevers. The variety and diviſion of which kind of Fevers, appear to me to have been unneceſſarily multiplied: as this cuſtom has affixed different appellations to the ſame identical and homogeneous diſeaſes ariſing from the ſame, or from every ſimilar proximate, cauſe; or to different ſtages, degrees, ſymptoms and conſequences of one and the ſame diſeaſe.

On this account, I thought it beſt to conſider all the known marine diſeaſes under a few ſpecies, and to reduce to ſome of theſe the ſeveral diſeaſes, which I have judged to belong eſſentially to the common bilious Fever: neither do I doubt but it will appear, in the ſequel, that even theſe few ſpecies are derived from one and the ſame proximate cauſe.

This method will, in my judgment, not only throw a clear light on the nature and diagnoſtics of thoſe diſeaſes, but facilitate the complete cure of them.

XIX. The truth of what has been advanced (XVIII) will in ſome meaſure be manifeſted,

manifeſted, if, relatively to marine diſtempers (XV) only the following obſervations be conſidered.

1. They are cotemporary, in the ſame countries and ſeaſons.

2. They are complicated; ſometimes the wretched patient is attacked by more than one; ſome of which appear to relieve others, as even the ardent bilious Fever ſometimes changes to a regular intermittent: ſome again generally follow others; or may ariſe from particular diſpoſitions, or the natural weakneſs of particular organs; ſuch are the Dyſentery and Cholera.

3. They are of a like nature; even thoſe which are cotemporary; ſo that all the vernal Fevers, the Diarrhœa and Dyſentery with inflammation, and even the putrid autumnal Fevers correſpond in exhibiting the ſame, or very nearly the ſame, character and degree of benignity or malignity, and are correſpondently ſimilar in their regularity or irregularity.

4. Hence it is, that their earlieſt types and appearances are ſimilar.

5. Laſtly,

5. Laſtly, from the premiſes, it ſeems probable, that they all proceed from the like cauſes, both external and internal; which I ſhall farther elucidate and confirm in the ſequel. They are moreover obſerved uſually to regulate themſelves according to their common proximate cauſes: in proportion to the force of which it is, that Fevers are more or leſs violent, more or leſs intermittent, remittent, or conſtant, *&c.*

XX. It has been a doubt with me, whether the Dyſentery ſhould not be claſſed among the malignant Fevers, as ſo frequent a concomitant of them: though I confeſs I find theſe two diſtempers to differ more than the others from the common putrid Fevers; and ſo far, that, on the manifeſt exiſtence of the Dyſentery the Fever ceaſes, and on the ceſſation of the Dyſentery the putrid Fever commences. Again, the Dyſentery and the remittent Fever are known to be abated by cold, and a froſt puts an end to them: further, it is more commonly ſeen to prevail at the ſame time with the putrid Fevers than with the malignant; in the firſt ſtage of them a great

great quantity of bile is frequently diſcharged, and, in both diſtempers, the firſt appearances are the ſame.

It is, however, the opinion of the moſt judicious Dr. Pringle, that the Gall-ſickneſs, or bilious Fever, may properly be divided into two kinds; one, in which the Fever, and the other, in which the Dyſentery prevails moſt; a diſtinction, which, with regard to the method of cure, very well deſerves attention.

XXI. The ſame diſtinction may likewiſe take place in the yellow Fever, and chocolate ſickneſs or black Fever, too well known in the Weſt-Indies. The potent cauſes of which act with ſuch rapidity and violence, as entirely to deprave the principal functions of the body: whence it may be juſtly termed a Fever of the moſt putrid and violent kind.

XXII. The malignant Fevers themſelves ſeem not without ſome analogy to the common putrid Fevers; and ſometimes the former not only receive their origin from the latter, and thus may be reckoned among the conſequences of them; but the effluvia of many patients afflicted with

with the latter, and lying in one place, are a common cauſe of the former. Nevertheleſs, I ſhould rather chuſe, upon the whole, to make ſome practical diſtinction between them, as the ſymptoms, the diſtant cauſes, and even the proceſs of cure, differ in many particulars.

XXIII. That theſe three diſeaſes are common in Weſt-India ſhips, is allowed by all Writers; their teſtimony is likewiſe confirmed by all the accounts I have been able to procure; and this will appear with an inconteſtable evidence, from an enquiry into the cauſes of them. Further, that the three diſeaſes before mentioned are perfectly the ſame in ſhips and in a hot country, as in other parts, is demonſtrated at large, concerning the two firſt, by Dr. Pringle (1), and with regard to the laſt, by Dr. Lind.

(1) Mr. Van Santen, who was phyſician to the ſix thouſand Auxiliaries ſent over to England, in 1744; and who, on account of his diſtinguiſhed knowledge, has ſince been inveſted with the honourable and important employment of Preſident of the Surgeons in all the Dutch Eaſt-India ſettlements, in anſwer to ſome queſtions of mine concerning the nature of the moſt common camp-ſickneſſes; and,

XXIV. Let

XXIV. Let it not, however, be in the leaſt imagined, that putrid Fevers cannot be ſo common or dangerous here in our climates, as in the Weſt-Indies: for, on a concurrence of the ſame cauſes, they have been ſeen to commit moſt dreadful havock: many deplorable inſtances of this occurred in a corps of Engliſh ſoldiers, conſiſting of four battalions, cantoned in Zealand: ſcarce a ſeventh part of them being fit for duty, and the *Royals* in particular, at the end of the campaign, had but four men who had never been ill(1).

XXV. I deſignedly omit entering into a particular deſcription of the ſeveral types, appearances, and ſymptoms, through the whole courſe of theſe diſtempers, as not immediately belonging to the queſtion propoſed: I hope it will be thought

whether the dangerous fevers in the hotter parts of the Eaſt-Indies had not a great affinity with them; was pleaſed, in a letter from Batavia, to acquaint me, that, on comparing both, he found very little difference in their nature, but that they ſooner came to a criſis there, the patients being frequently carried off in three or four days.

(1) Pringle, part i. chap. vii. p. 70.

ſufficient

sufficient, if I confine myself to the most essential characteristics, by which, particularly at their first invasion, they may be clearly known and distinguished from others: and, as accuracy requires, I shall, following the above mentioned Writers, point out the symptoms accompanying the beginning, progress, and the several periods of the distempers.

XXVI. The putrid Fever is easily known by a violent pain, especially in the forehead, back, loins, and knees, sudden deliriums; a bitter taste in the mouth, or like that of rotten eggs; a fetid breath; extreme thirst; burning heat; great pain and oppression in the stomach; a nausea; violent retchings, and casting up sometimes a yellow, black, green, bilious, or other corrupt matter; sudden discharges of very fetid excrements, with more or less pain and oppression in the bowels.

XXVII. The malignant Fevers are those, which are either produced in the body by putrid Fevers, and distinguish themselves by unusual and extremely more violent and various symptoms; or are immediately contracted from without by con-

tagion. The latter cannot be better exhibited than in the following words, which I borrow from the frequently and juſtly commended Dr. Pringle: "When "the diſtemper comes on ſlowly, the firſt "complaints are ſmall interchanges of "heat and cold, tremblings of the hands, "ſometimes a ſenſe of numbneſs in the "arms, weakneſs of the limbs, loſs of "appetite; and, the diſorder being great-"eſt at night, the body is hot, the ſleep "interrupted, and not refreſhing; ſome "pain or confuſion of the head, but ne-"ver violent. The pulſe is at firſt a little "quicker than natural, the tongue is "white, but the drought inconſiderable; "they, who are thus affected, find them-"ſelves too much indiſpoſed to go about "buſineſs, but too well to be wholly con-"fined. In this ſtate ſometimes a change "of air will remove the diſorder, ſome-"times a ſweat: what may ſeem par-"ticular, I have more than once known "a large bleeding, during theſe ſym-"ptoms, inſtead of relieving the head, "immediately ſink the pulſe, and bring "on a delirium. Except by this laſt

"mark,

" mark, and the tremor of the hands,
" the disease is not easily to be distinguish-
" ed, in the beginning, from any com-
" mon Fever. The diagnostics must
" therefore be taken from other circum-
" stances. We are to enquire whether
" the person has been exposed to the
" usual causes of Fevers, or to foul air
" and infection: again, whether he is
" relieved by bleeding, or not: because,
" in inflammatory Fevers, bleeding con-
" stantly moderates all the other symp-
" toms, but, in this, seldom gives ease.
" When the Fever advances fast, the
" symptoms already mentioned are all
" in a higher degree; and to these are
" added great lassitude, a *nausea*, pains
" in the back, a more constant pain and
" confusion in the head; a dejection of
" spirits, and an uncommon tremor of
" the hands. At this time, the pulse is
" never sunk, but beats quick, and often
" varies the same day, as to strength and
" fullness; the first bleeding, if mo-
" derate, affects the pulse little; but
" if the evacuation be large, and espe-
" cially, if repeated, to answer a false in-

" dication of inflammation, the pulſe, in-
" creaſing in frequency, is apt to ſink in
" force, and often irrecoverably, whilſt
" the patient becomes delirious. But
" withal, we muſt obſerve in every
" caſe, independent of evacuations, the
" pulſe ſooner or later ſinks, and gives
" then a certain indication of the malig-
" nity of the diſeaſe: Beſides other ſymp-
" toms, theſe Fevers are frequently attend-
" ed with *petechiæ*, or red or livid ſpots
" on the ſkin: and theſe are ſometimes
" ſo confluent, that at a little diſtance,
" the ſkin looks ſomewhat redder than
" ordinary, as if the colour were uni-
" form; but, upon a nearer inſpection,
" the interſtices are ſeen; they come out
" thickeſt on the breaſt and the back,
" leſs on the legs and arms, and very
" ſeldom on the face(1)."

XXVIII. The Scurvy, which has lately been fully treated of by Dr. Lind with ſo much learning and judgment, long experience, and preciſe confutations of ſeveral current opinions (2) (dignified by the

(1) Pringle, part iii. chap. vii. p. 252.

(2) He affirms that Eugalenus and his followers reſpectable

reſpectable names of Eugalenus, Hoffman, Boerhaave, and others) is known to every common ſeaman by three ſure and conſtant ſigns. Firſt, a torpor, or liſtleſſneſs, ſallowneſs and tumours in the face; laſſitude on the leaſt motion, a difficulty of reſpiration; afterwards faintings, and even a haſty death; the breath is fetid; the gums become ſoft, ſpungy, and at laſt quite rotten; yellow, red, blue, livid, and black ſpots appear on the ſkin.

had no right knowledge of this diſeaſe; that in ſome places he wants candour; and thus is very unworthy of that incenſe which has been offered to him by many Writers; that the Scurvy is not ſo common as generally apprehended; that the diviſions of Eugalenus, Charleton, Gideon Harvey, Blankard, Willis, Hoffman, Boerhaave, and their followers, are both needleſs and dangerous.

That, to confound the Scurvy with other diſeaſes, is of very unhappy conſequence.

That there is only one kind of Scurvy.

That on the ſea and a-ſhore, in various perſons, and climates, whatever be its cauſes, it is one and the ſame diſeaſe.

That all the difference lies in the degrees of malignancy.

That it is neither hereditary nor contagious.

And, that it cannot be, that the red part of the blood be thick and ſizey, and the ſerum, at the ſame time, thin, ſharp, and corrupt.

Swellings in the legs, and contractions of the nerves.

CHAP. V.

Of the proximate Cauſe.

XXIX. HAVING thus ſpecified the diſtempers which come under the appellation of the uſual diſtempers in the Society's Queſtion, together with the ſigns, ſymptoms, and diagnoſtics of them, I now proceed to inveſtigate the firſt article of the queſtion; namely, *What are the cauſes of the uſual diſtempers?*

Herein I ſhall obſerve the cuſtomary order, firſt enquiring into the proximate, and then trace the antecedent cauſes; that by a true knowledge of the nature, ſimilarity and analogy of thoſe diſtempers, the practitioner may be the better enabled to diſcover, in what manner the more remote cauſes concur to the production of them.

XXX. I have already (XVIII.) delilivered it as my opinion, that the three capital diſtempers, the putrid, the malignant Fever, and the Scurvy, do not

differ

differ in nature; that is, they owe their exiſtence to the ſame cauſe: this, therefore, it is incumbent on me to elucidate and prove.

I affirm, then, that in all thoſe diſtempers, the proximate cauſe is putrefaction, in a greater or leſs degree, either reſiding eſpecially, in ſome particular part of the body, or diſſeminated through the whole.

XXXI. I ſhall not here attempt a preciſe and analytic inveſtigation of the nature of putrefaction, nor endeavour even to conjecture that intimate, ſpecific arrangement, and motion of the particles of bodies affected by it, in which it may eſſentially conſiſt; as ſuch a diſcuſſion muſt extend this diſcourſe much beyond the limits I propoſed. I ſhall, therefore, content myſelf to ſay, in general, that by putrefaction, with regard to the human body, I underſtand a certain degeneracy or corruption of our juices, whence they contract a peculiar acridity or ſharpneſs, more or leſs injurious to the ſolids; and thus impeding their functions, and altering their natural tone and qualities, they produce ſymptoms more or leſs violent and ma-

lignant, and occaſion a great relaxation both of the conſiſtence of the fluids, and the vibration of the ſolids. The firſt perceivable alterations which putrefaction cauſes in our habit, are a colliquation or attenuation of the juices; and in the ſolids, ſuch a diſſolution of their firmneſs and connection as correſpond with our notion of Atony, or Relaxation.

Hence the nature of putrefaction, ſo far as it is to be known from the firſt prognoſtics, or ſigns, appears to conſiſt in an inteſtine motion of the juices, by which the equable mixture of their conſtituent particles is thrown into confuſion and deſtroyed; whilſt, perhaps, the air, which naturally is lodged in that mixture, and was before deprived of its elaſticity, now by ſome means or other recovering it, by its conſequent expanſion and proſilition, as it may be termed, is to be accounted one of the primary or chief cauſes of putrefaction.

At the ſame time I apprehend, with Dr. Pringle, that the production of a volatile animal lixivial ſalt, is no more neceſſary to putrefaction than a ſtench, which

which ſome, however, make an eſſential requiſite to putrefaction; as if, according to the common prejudice, nothing which does not emit an offenſive ſmell, was to be conſidered as in a putrid ſtate.

Thus, conformably to what has been alledged above, I agree with that excellent Writer, that the beginning of putrefaction conſiſts in a ſeparation and diviſion of the particles, both fluid and ſolid; wherefore, on the fibres proving more relaxed, and the juices becoming more fluid, a putrefaction may be inferred; whether this alteration tend to the improvement of the health, or to the deſtruction of the body; or whether it be agreeable or offenſive to our ſenſes.

XXXII. The reaſons, which incline me to embrace the opinion, that putrefaction is the primary cauſe, I deduce,

1. From the nature and action of the antecedent cauſes.

2. From the various ſymptoms of the diſtempers.

3. From the methods found to be beneficial or detrimental in thoſe diſtempers.

4. From

4. From the examination of the bodies of patients who have died of thoſe diſtempers.

XXXIII. With regard to the antecedent cauſes, heat, a moiſt or corrupt air, contagion, food, drink, too much or too little exerciſe, coſtiveneſs, obſtruction of inſenſible perſpiration, all theſe particulars I ſhall endeavour to ſet in a ſatisfactory light, when I come to treat ſeparately of each of the before-mentioned cauſes.

XXXIV. As to the ſymptoms of the diſtempers, which denote a putrifying cauſe, theſe are,

In the common, putrid, or bilious Fever (the corrupt matter ſtill having its firſt ſeat in the *primæ viæ*, that is, the ſtomach and inteſtines) chiefly fetid eructations, thirſt, a bitter taſte in the mouth, or like that of rotten eggs, vomitings, putrid ſtools, and worms; with an averſion to fleſh, fiſh, and all animal food, even to an egg.

This corrupt matter in the ſtomach and bowels, having acquired a great degree of ſharpneſs, and having paſſed into the blood, is eaſed and attenuated by phlebotomy; then follows a Fever, moſtly of

of the remittent and infectious kind, the continuance of which brings on a malignant Fever, as ſhall hereafter appear.

With regard to the malignant Fevers, a ſudden ſinking of the pulſe and proſtration of ſtrength, lowneſs of ſpirits, a ſtinking breath, fetid evacuations of all kinds, ſo that even the ſmell of the ſweat, and of the blood itſelf, are offenſive in an advanced ſtage of the diſeaſe. The tongue is black, deliriums, languors, and relaxations, eruptions, and ſpots on the ſkin are frequent: the urine, the excrements, and, in extreme caſes, the very ſweats are bloody. Sometimes there are profuſe exudations, accompanied with hæmorrhages; certain indications that the globules of blood, being diminiſhed in their diameter, have forced their way into the excretory tubes, and iſſue through them, as the tubes themſelves are alſo become more flaccid.

In the Scurvy, ſoft and corroded gums; the red particles of the blood, when diſcharged from the patient by bleedings, or by opening a vein, always diſunited, yet without a ſeparation from the ſerum; and very

very ſoon putrifying; fetid breath and diſcharges; a ſudden and remarkable diminution of ſtrength; ſpots of ſeveral kinds; the urine high-coloured; putrid ulcers on the legs; ſanguineous ſweats, hæmorrhages, an exacerbation of the ſymptoms of any other ſupervening diſtemper, generally allowed to be of the putrid kind, as all endemical diſeaſes, the Small-pox, Meaſles, Dyſentery, &c.

XXXV. The preſervatives and remedies which experience has ſhewn to avail in putrid Fevers and in the Scurvy, are all of ſuch a nature, as to withſtand or remove putrefaction; on the contrary, whatever thins the blood and relaxes the ſolids, aggravates theſe diſeaſes, as ſhall be inſiſted on more fully in the ſequel

May I not alſo add, as ſigns of putrefaction, the qualities of the ſaliva, which, in the Scurvy, has the ſame effect on vegetable aliments, and exhibits the like appearances, with the putrefaction of animal food, in the ſtomach of perſons in health; as people who work hard, the far greateſt part of whoſe food is farinaceous, ſubdue, by their greater action and exerciſe,

exerciſe, the viſcidity of the unfermented chyle (1). And on this topic of putrefaction, we might alſo propoſe ſome queries, on the affinity between the firſt ſymptoms of the Plague with the ardent putrid Fevers and Dyſentery; the more extenſive propagation of the firſt; the different contagion of each; the different degrees of danger; the difficulty of reſpiration, &c.

XXXVI. The examination of the bodies of patients, who have died of the Dyſentery and Scurvy (the ſimple common putrid Fevers being ſeldom mortal, until they degenerate into malignant) has diſcovered many proofs of a putrid conſtitution, a flaccidity of the ſolids, and diſſolution of the fluids.

1. Thus, on opening a ſubject who died of the Bloody Flux, the larger inteſtines were black and putrid; the coats preternaturally thick (no uncertain mark of a preceding inflammation) much ulcerated within; and, in ſome parts, wholly abraded, or changed into a ſlimy corrupted ſubſtance of a greeniſh colour;

(1) Pringle, append. paper v. exp. xxxvi.

the

the fat of the *omentum* alſo green; but neither the liver nor ſpleen tainted; that part of the *vena cava* which lay on the *vertebræ* extremely ſoft and flabby. In the right ventricle of the heart the blood was wholly clotted; but in the larger veſſels partly fluid, and of a blackiſh hue: in another ſubject, the ſpleen was of an extraordinary bulk, and weighed no leſs than three pounds eleven ounces. The kidneys were ſmall and flaccid; the *pelvis*, in both, larger than common; the bladder in a ſtate of corruption: the vaſcular coat had the appearance of a preparation well injected with wax; the ſmaller inteſtines were firm but inflamed, and both theſe and the ſtomach full of air. The heart was large, and in its right ventricle ſome coagulated blood of a coriaceous firmneſs: it was remarkable, that notwithſtanding this diſeaſed ſtate of the bowels, no part of them was ulcerated (1).

2. Another ſubject who died of a malignant Fever, ſucceeding a Dyſentery,

(1) Pringle, l. c. part iii. chap. vi. append. paper vii. exp. xlvi. N. B. Theſe two caſes are conſiderably abridged from two more, fully deſcribed in the edition of Dr. Pringle's Work, from p. 223, to 226.

though

though opened the next day, emitted an intolerable ſmell; the inteſtines were totally mortified, and part of the ſtomach. The outward coat of the liver was alſo putrid; and inwardly were ſeveral abſceſſes. I muſt not omit, that in one corpſe, the liver was of ſuch an extraordinary bulk as to weigh about ten pounds (1).

3. The principal types of putrefaction, declaring themſelves in a patient dead of the malignant Fever, were inflammations or abſceſſes in the brain; a thin whey-like pus in its ventricles; the whole cortical and medullary ſubſtance uncommonly flaccid and ſoft: a mortification in the lower part of the liver; the larger inteſtines corrupted, and the ſmaller inflamed (2).

Laſtly, I meet with the following appearances, taken notice of by Lind, in the diſſection of ſcorbutic bodies.

The blood in the veins was ſo entirely broken, that (3) by cutting any conſiderable

(1) Pringle, p. 227, 228.

(2) Idem, p. 265 to 267.

(3) Lind, p. 312, 313, &c. Where he has alſo this paſſage, "We have ſeen ſeveral, who, without "pain, dropped down dead. They had no apparent branch

branch of a vein, the adjacent veins became totally emptied; the heart was found putrified, and full of corrupt blood; the lungs were blackiſh and putrid; and a watery humour, generally of a reddiſh colour, was found in the cavities of the breaſt and belly, which was of ſuch a corroſive quality, that the hands being put into it, their ſkin came off, and this was attended with heat and inflammation; the auricles of the heart were as big as the fiſts; and the ſpleen of three times its natural ſize; the muſcular parts mortified, ſwollen and rigid with corrupt blood, and breaking to pieces on the leaſt handling; a blackiſh blood extravaſated and diffuſed here and there under the ſkin; the epiphyſes were found ſeparated from the bones; the ligaments of the joints were corroded and looſe; the cartilages of the *ſternum* ſeparated from the bony part of the ribs; inſtead of the ſweet oily mucilage within the cavities of the

" ſickneſs, we found their muſcles gangrened and " ſtuffed with a black corrupted blood; and upon " handling them, they fell to pieces."

joints,

joints, only a greeniſh liquor of a very cauſtic quality was found.

XXXVII. Notwithſtanding theſe appearances are far from warranting a poſitive concluſion, that this putrefaction after death, though ſo very ſtrongly marked, was the immediate cauſe of the diſeaſe, rather than its conſequences; yet they certainly prove a tendency in thoſe diſeaſes to putrefaction; and the putrid nature of them after, when continuing for ſome days, or at leaſt, in their laſt or latter ſtage. And may not the incomparably greater tendency of all animal ſubſtances to putrefaction, in the torrid Zone, be juſtly admitted as a fifth reaſon?

XXXVIII. The great diverſity in the types and appearances of the three diſeaſes, in queſtion, has induced many to ſuppoſe them of a quite different nature and genus: for my part, I hold them to be homogeneous; in nature and quality the ſame, as I have before ſhewn the cloſe affinity between the intermittent, remittent, conſtant, and ardent autumnal putrid Fevers in Holland, and in the torrid Zone, with or without the Flux; and

this opinion I ground on the following obſervations.

1. That the ſame antecedent or predifpoſing cauſes in the Weſt-Indies, have been followed, not only by the putrid and malignant Fevers, but alſo by the Scurvy (1); whence it is probable, that the officers, in their ſeveral claſſes, are leſs ſubject to either of theſe three diſtempers (1).

2. Common putrid Fevers ſometimes degenerate into malignant, as the yellow Fever in the Weſt-Indies; which, generally from remittents, change into malignants.

3. Malignant Fevers, the Flux, and Dyſentery, in ſome inſtances, exiſt at the ſame time. The malignant Fever has been known to follow a Dyſentery, and the latter the former: and thus alſo the putrid Fever and Scurvy reciprocally, to the great exacerbation of each. Putrid Fevers, when at their higheſt, contract a mixture of the malignant.

XXXIX. That the malignant Fevers are of the ſame nature with the Scurvy, may be concluded,

(1) Biſſet, p. 39---41.

1. From

1. From many conſequences common to both diſtempers, with regard to the rarefaction of the blood, and flaccidity of the veſſels; namely, the ſkin's being yellow or tawney; the wheyiſh lymph on the blood, the humour ariſing from the bliſters, the white of the eye, the ſweat and chyle, all being of the ſame morbid colour, or appearance; red, blue, and purple ſpots on the ſkin; the breath offenſive; the ſweat, urine, and fæces bloody; various hæmorrhages; the blood diſcharged by the lancet of the like quality: the force of the heart, in the criſis of the diſtemper, too weak to drive the blood up to the brain, whilſt the body is in an erect poſition; the heart, liver, and ſpleen, on the diſſection of bodies, in both diſeaſes, being exceſſively ſwollen; deliquiums, &c.

Another, argument of no leſs weight, is, the entire ſimilarity, or even ſameneſs, of the preſervatives from, and of the remedies in both caſes.

The judicious Pringle obſerves, that ſince ſugar and acids are come into vogue, all putrid diſeaſes, the Scurvy, no leſs than putrid and malignant Fevers, the Dyſen-

tery, and even the Plague itſelf, are much abated.

Biſſet affirms, that the ſame preſervatives in Weſt-India Voyages, anſwer as well againſt malignant, remittent, intermittent, and conſtant Fevers, as againſt the Scurvy (1).

The manner of treatment in the putrid Fevers, is very nearly the ſame as in malignant; whilſt, in the latter, the inflammation in the brain is not followed by any extreme corruption in the juices. The Bark is found to have the like beneficial effects in the malignant Fevers, and the Scurvy with Gangrenes, as in the intermittent; wine, in the malignant Fevers, and in the Scurvy, is a proper cordial, whilſt much bleeding turns putrid Fevers into malignant; and in theſe, as in the Scurvy, nothing can be more pernicious.

XL. I am, therefore, of opinion, that the difference of theſe three diſtempers chiefly lies in the mode or manner of the putrefaction.

1. If the acridity or corruption of the blood comes on haſtily, the conſequence

(1) Biſſet, p. 2.

is

is an ardent, conſtant, remittent, or intermittent Fever.

2. If the purulent matter be carried upwards or downwards, in order for ejection; then is produced a violent vomiting, or *Cholera morbus*, a Flux, or Dyſentery.

3. If ſuch matter, inſtead of being ejected, mingles with the blood, or the latter be corrupted, immediately, by tainted extravaſations; in both caſes it works like yeaſt, that is, by an aſſimilating power, inherent in all putrid animal ſubſtances, to corrupt, and to render all other ſubſtances like themſelves; and this, in the very ſtricteſt ſenſe, that is, they act like the yeaſt of beer, mixed with any vegetable ſubſtances, capable of a vinous fermentation (1).

Thus, when the corruption or colliquation of the humours begins, hereby, to increaſe, the brain or the liver become obſtructed and inflamed, which is followed by ulcers, and even mortifications. This inflammation of the brain, which may

(1) Pringle, append. paper ii. exp. xiii. paper iii. exp. xviii.

properly be accounted a ſymptom, is the *fomes* of the Fever, and to it are owing all the nervous ſymptoms.

4. Laſtly, if theſe cauſes of Fevers operate ſlowly, and the putrefaction has inſenſibly pervaded the whole body, ſo as to become, as it were, habitual to it; or, if the putrid Fevers have been but imperfectly cured, the conſequence, among a ſhip's company, will be the Scurvy.

And here we may query, whether the firſt and chief reſidence of the putrefaction in the Scurvy, is not in the ſerous juices and veſſels? Dr. Pringle has, by ſeveral experiments, found, that the ſerous part of the blood is not ſo apt to be corrupted as the red globules (1); which conjecture ſeems to be confirmed by ſeveral ſymptoms peculiar to the Scurvy; and this is alſo the foundation of Biſſet's opinion, that the ſeat of the Scurvy is in the ſerous veſſels, when obſtructed (2).

(1) Pringle, part ii. chap. i. part iii. chap. viii. append. paper vii. exp. xlviii.

(2) Biſſet, p. 63.

CHAP

CHAP. VI.

Of the preceding, or remote Cauſes.

XLI. HAVING thus circumſtantially, and I hope with a ſatisfactory perſpicuity, traced the proximate Cauſe of the diſeaſes, moſt common among mariners, I am now to enter on a diſcuſſion of the remoter Cauſes; and to proceed more regularly in this, I chooſe to follow that diviſion of them, which diſtinguiſhes the Cauſes into prediſpoſing and accidental, or ſuch as excite morbific powers; by the concurrence of which is produced the proximate Cauſe, or Putrefaction, which differs little from the diſtemper itſelf.

XLII. Among the former claſs are, firſt, the natural diſpoſition or tendency to putrefaction, which our humours have in common with all animal fluids; and ſo conſiderable is this tendency, that a very ſmall matter really ſuffices to bring them into that actual ſtate. Either a little exceſs, or a defect of animal heat and motion, powerfully promotes putreſcence in us; and conſequently for the preſervation of our

fluids from this morbid, and frequently mortal, alteration, they ſtand in need of a continual renovation by food, and new chyle; and require a diſcharge of thoſe effæte and degenerate particles, in which putrefaction is commencing. This is evident in the caſe of thoſe, who die of famine: for were we to take the healthieſt perſon, and to deprive him of all ſolid and liquid aliment; the ſalts become more and more acrimonious, till a fever, delirium, and ſuch other acute ſymptoms appear, as ſoon terminate in effectual putrefaction and death. The progreſs of this putreſcence of the humours may be obſerved in a healthy nurſe, whoſe milk, for ſome hours after eating, is white, thin, ſweet, and grateful; but, let her faſt for ſixteen or eighteen hours, and it becomes thick, yellow, ſaltiſh, and diſagreeable; and, if this faſting be continued ſome few hours longer, it becomes of a much deeper yellow, nauſeous, and even ſtinking (1).

No wonder, then, that without neceſſary precautions, all men, even the moſt

(1) Huxham, l. c. p. 55---71.

robuſt,

robuſt, are ſo ſuſceptible of Fevers, and of the Sea Scurvy.

XLIII. Secondly, Certain circumſtances and habits of body render ſome more ſubject to putrid diſtempers than others; and ſome have been known, in very ſickly times, to be wholly free from them; the true cauſe of which particular and happy exemption, is often myſterious and inacceſſible.

Thus it has been obſerved, that Surinam agrees much better with age than youth; others affirm, at the ſame time (1), that Weſt-India Voyages are not ſo dangerous to boys, as to full grown and adult bodies. Dr. Pringle alſo informs us, that four Engliſh battalions being encamped and cantoned in Zealand, both thoſe in the

(1) Preſent State of all Nations, vol. xi. Mr. Biſſet has alſo a paragraph to the following purpoſe; "Among new-comers in the Weſt-Indies, who live "at ſea wholly on the ſhip's proviſions, adults of a "hale robuſt conſtitution, alert, of good ſpirits, un-"der the age of forty, and boys, are the leaſt ſub-"ject to the Scurvy: and thoſe who are ſeaſoned to "the torrid Zone, by living about a year or more "therein, are ſeldom much affected with this diſ-"eaſe, during their further ſtay in the hot climates."

field,

field, and in quarters, were ſo very ſickly, that ſome of the corps had but an hundred men fit for duty; and of the *Royals* in particular, at the end of the campaign, only four men were known, who had not been afflicted with the Gall-ſickneſs, or Dyſentery (1).

A weighty circumſtance in the torrid Zone is, the not being ſeaſoned to it; experience ſhews, that men, like trees, thrive beſt in their native climate; that ſtrangers, ſoon after their arrival in the Weſt-Indies, are ſubject to be ſeized with Fevers, or the Scurvy, more dangerouſly, and attended with a higher putrefaction, than the natives, or thoſe who are ſeaſoned to the climate; and that the body acquires this quality, not ſo much by having once weathered the Fevers, or the Scurvy, as by the conſtant enjoyment of health, for the ſpace of the firſt year; to which favourable circumſtance a ſpeedy paſſage has often been obſerved not a little conducive.

Moreover, in Weſt India Voyages the ſeamen are found to be more ſubject at

(1) Pringle, part. i. chap. vii.

ſea

ſea to the Scurvy than the officers, and leſs in merchantmen, than in men of war.

XLIV. Thirdly, ſeveral obſervations concur to render it highly probable, that the ſeeds of Fevers (1), and of the Scurvy (2), may, for ſome time, lurk in the body, till, by the acceſſion of other morbid powers, theſe diſeaſes are manifeſtly excited.

XLV. Fourthly, there are many in whom the marks of a certain degree of relaxation of the ſolids, and a weaker coheſion of the fluids, are too evident; and though neither of theſe may be conſiderable enough to conſtitute actual diſeaſes; yet they may juſtly be ſuppoſed ſo many deflections from a perfect ſtate of health. Conſtitutions thus circumſtanced are particularly ſubject to putrid diſtempers; and hence it is, that in perſons of a plethoric habit, putrid Fevers are moſt violent (3).

There are ſome perſons, in whom the red globules, through a debility in the ac-

(1) Pringle, part i. chap. iii. part iii. chap. vii.
(2) Huxham, p. 41. 53.
(3) Idem, p. 13.

tion

tion of the arteries, are not ſufficiently compacted; whence their texture becomes ſo looſe, and ſo eaſily broken, that their linen, under the axillæ, or arm-pits, is ſometimes tinged of a reddiſh colour. Nevertheleſs, this has ſometimes been obſerved to occur under all the appearances of health, and without any unuſual increaſe of the ordinary motion of the blood, accompanying this ſingular phænomenon (1).

An unuſual ſenſation of cold in the pores on our ſurface, from their being too wide and open, occaſions an obſtruction in them, and a conſequent abatement of the diſcharge by perſpiration.

How this ſtate of the ſolids and liquids is the effect of noxious powers from without, will, I hope, be clearly explained in the ſequel.

XLVI. Fifthly, ſome diſorders in the body, which are diſcernible by ſeveral effects, either ſingly, or joined with other concurring cauſes, bring on putrid diſtempers, or exacerbations of them, if already exiſting.

(1) Huxham, p. 44. 57.

Thus,

Thus, from a common putrid or bilious Fever and a Dyſentery, proceeds a malignant Fever with ſpots and mortifications; becauſe, from the over-rapid motion of the blood, and the exceſſive heat occaſioned by ſuch rapidity, the red globules are ſo conſiderably diſunited and broke, as to bring on a putrid acrimony, which affects the body in the like manner with the infectious effluvia, of which we ſhall ſoon have occaſion to make further mention.

They who have any ſcorbutic ſymptoms are, in proportion, more ſubject to the Dyſentery, and putrid and malignant Fevers; and, likewiſe, moſt ſeverely handled by thoſe diſtempers.

They who have been brought low by other diſeaſes, are found to be more ſuſceptible of malignant Fevers; as the Scurvy more eaſily ſeizes thoſe who have been exhauſted by thoſe Fevers, or by any other lingering diſeaſes, eſpecially after febrile relapſes, than perſons in health and of a ſound conſtitution.

To have once had even malignant Fevers, or the Scurvy, is ſo far from being a ſecurity

a ſecurity againſt a ſecond attack of thoſe diſtempers, that the body is more diſpoſed to the re-infection, and it is alſo more violent.

To contract the malignant Fever by infection, whilſt under the Small-pox, though of a kindly ſort, greatly increaſes the danger (1).

Perſons who have recently paſſed through a ſalivation, and whoſe blood, conſequently, is in a ſtate of diſſolution, are ſooner infected by noxious effluvia than others; and malignant Fevers and the Scurvy alſo are more ſevere and dangerous from ſuch circumſtances (2).

XLVII. In the inveſtigation of the noxious powers, of which not only the diſpoſitions of the body to putrefaction already mentioned (XLVI) are an effect; but which alſo, either ſingly or conjunctly with them, produce putrid diſtempers, we ſhall follow the order obſerved by the celebrated Boerhaave, and that in a very ſuccinct manner, as it may be ſufficient to ſpecify only the principal.

(1) Pringle, part iii. chap. vii.
(2) Idem, part iii. chap. vii.

XLVIII. Firſt,

XLVIII. Firſt, the Air, which, whereever we are, environs us; which we continually inhale; which penetrates into our blood and humours; which mingles with our aliment, and has a powerful influence on our organs; the air, I ſay, claims our particular notice (1).

1. This, according to the before cited obſervations (III, V, VI, VII.) in the torrid Zone, and likewiſe within a ſhip, is extremely hot, moiſt, and light; and, by this aſſemblage of qualities, ſo near a-kin to each other in their effects, its noxious power is conſiderably augmented, and conſiſts principally in a dilatation which affects the fluid parts more than the ſolid, as an incentive to motion; which, how-

(1) So great is the power of the air to cauſe or promote putrefaction, that if kept from ſubſtances naturally putreſcent, the putrefaction is prevented, as we now, beyond contradiction, know from Mr. Eller's Experiments, who, in an exhauſted recipient, kept milk, wine, and blood, during the ſpace of fifteen years, without the leaſt perceivable taint; the blood itſelf being in its pure natural ſtate, as if juſt drawn. Monthly Review for April, 1759. Biblioth. des Sciences, Oct. Nov. Dec. 1759. p. 272. Hiſt. de l'Acad. Royale des Sciences et Belles Lettres a Berlin, 1757, tome XII. part ii. and 1759, vol. XIII.

ever,

ever, ſoon terminates in a relaxed coheſion of the ſolids; in a rarefaction of the juices; and in a putreſcent diſpoſition throughout the whole body; but eſpecially in the *primæ viæ*, or firſt paſſages (1).

This is confirmed by obſervations from all quarters; for it is only in ſummer that the bilious Diſeaſes, and the Dyſenteries, are very current and endemial with us in Holland. After the battle of Dettingen, near half the private men of the Britiſh army were taken with the Dyſentery, a calamity owing to heat and moiſture, having the night following lain on the field of battle without tents, expoſed to a heavy rain. The diſeaſe was common, though not nearly ſo frequent among the officers, of whom thoſe were firſt ſeized, who had lain wet at Dettingen, the reſt ſuffered by contagion (2). In proportion to the

(1) Boerhaave Inſt. Med. §. 746. 751.
Gaubius Pathol. §. 423, 424. 429, 430. 433. 436.
Stokke, l. c. p. 13—15. 21—28.
Home, Principia Medicinæ, p. 18.

(2) Pringle, part i. chap. iii.
In the autumn of the year 1744, the Dutch Auxiliaries being encamped on a high plain, near Liſle, the number of patients ſent to the General Hoſpital

greater

greater degrees of heat, the ſtomach and bowels are the more affected, and the breaſt leſs; but in winter, the very reverſe occurs.

Further, the diſeaſes ſet in ſoon or late, according to the different degrees of heat and moiſture: their duration, extent, and infection, together with their ſymptoms, depend on the like qualities of the weather. The firſt appearance does not occur, until the continuance of the heat begins to produce putrefactions, with noxious exhalations from the waters. In October theſe exhalations abate, and in November the froſts bring them to a period; herein reſembling the peſtilential Fever, which, according to the unanimous ſentiments of all Phyſicians, from the time of Hippocrates, are never felt in Europe, but in ſeaſons of a hot and moiſt in-

for the bilious Fever and Dyſentery were inconſiderable, and ſcarce equalled the returns of only four regiments, which covered the head-quarters at Ciſoin, their encampment being on a low dangerous ground; whilſt the Dutch Foot-guards, on that ſervice, who lay apart on a riſing, felt as little of thoſe diſeaſes, as the camp on the plain.

temperature, their deplorable havock ceaſing, as the air becomes cool and dry.

Between the Tropics the rainy ſeaſons, both by land and ſea, are the moſt unhealthy and dangerous; being productive of putrid Fevers and the Scurvy (1).

Epidemical diſtempers are much more common in hot than in cold climates (2).

Laſtly, let us call to mind, among other experiments of Boerhaave's, on this head, that of a dog ſhut up in a Sugar-baker's heated ſtove; the whole maſs of whoſe humours was, by the heat, corrupted to ſo high a degree, in a few minutes, as to emit an inſupportable ſtench; ſo thoroughly diſſolved, that the very ſaliva became bloody; and ſo horribly offenſive, as to throw a very vigorous man, concerned in the experiment, into faintings (3).

Hence then it is evident, that a hot, moiſt, and light air, is very productive of putrid Diſeaſes; add to this, what I ſhall hereafter adduce, concerning the cold of

(1) Pringle, part iii. chap. iv.

(2) Walton's obſervations on Mr. Sutton's invention.

(3) Boerhaave's Chem. tom. i. p. 275. Stokke, p. 34---38.

the

the nights, and the obſtruction of inſenſible perſpiration; and we ſhall readily apprehend---

Why a more copious perſpiration is neceſſary in the Weſt-Indies?

Why, in the torrid Zone, putrid Fevers are ſo very epidemic, ſo violent, and ſo mortal?

Why malignant Fevers are ſo extremely dangerous? and why their fatal conſequences are ſo very rapid too?

Why our bodies, both in heat and cold, if attended with dampneſs, contract ſuch a diſpoſition to the Scurvy? and why, to thoſe already labouring under diſtempers, ſuch an intemperature is a very aggravating circumſtance?

Why wet cloaths, and damp beds, ſpread putrid Fevers, Dyſenteries, and the Scurvy among a ſhip's company?

2. The fetid vapours in the air, which the great heat exhales in ſuch baneful quantities from a ſhip's hold, and from the marſhy coaſts of the Weſt-Indies, are proved by many well atteſted accounts, to be, in the higheſt degree, pernicious to health; and to have given riſe

to the moſt dangerous putrid Fevers. To theſe vapours, which the evening breeze (*) carries out to ſea, may it not be attributed, at leaſt in ſome meaſure, that ſhips are much more ſickly, whilſt at anchor near thoſe marſhy coaſts, than when on the main ſea?

The caſe of the Engliſh ſquadron under Commodore Mitchell (V.) in the year 1747, of which not one ſingle man had the Fever or Flux, whilſt both thoſe diſtempers raged with a fatal violence in the iſland of Walcheren, ſweeping away the very natives indiſcriminately with the Engliſh ſoldiers on duty there; this caſe, I ſay, inclines me to think, that the danger of theſe infectious vapours, to ſhips lying at any diſtance from the ſhore, is leſs than what is generally apprehended.

On the other hand, the great care and attention, which, for ſome years paſt, has been ſo exactly obſerved in Engliſh men of war, for purifying and renewing

(*) A Maſter of a ſhip, a man of veracity, and who has long uſed the Weſt-India trade, lately affirmed to me, that they know by the ſmell when they are drawing near to the land, though not within ſight of it.

the air both in the hold, and between decks, by means of Dr. Hales's and Mr. Sutton's uſeful ventilating engines, ſhew, there is ſufficient reaſon for concluding, that the exhalations from the bilge-water, ſtagnating in the bottom of the ſhip, are detrimental, and apt to occaſion putrid diſtempers. It is a current and frequent obſervation, that on pumping the ſhip, the lace on the hats, and the buckles, eſpecially of thoſe who happen to be between decks, contract a very foul hue and tarniſh.

3. The air itſelf, even abſtracted from ſuch contingent humidity and vapour, aſſumes a quality ſcarcely leſs noxious, for want of a ſucceſſive renovation (which all Naturaliſts hold to be of the utmoſt conſequence) when it is continually emitted among, and inhaled by, a great number of people though healthy; and much more if wounded perſons, or patients in the Dyſentery, or putrid or malignant Fevers, mingle their morbid perſpiration and effluvia with the air, to be inhaled by thoſe as yet in health. The air is alſo further contaminated by the fetid

exhalations ariſing from corrupted animal ſubſtances, when through negligence, or want of cleanlineſs, or from the fumes of the great number of candles, always burning in the lower parts of large ſhips, it becomes charged with ſimilar vapours.

This air being inhaled by the lungs, and blended with the aliments, is received into the body, where acting ſomewhat like yeaſt, it infects the juices with a general putreſcence, which is inductive of melancholy ſymptoms, eſpecially in the nervous ſyſtem; and both in the healthy and ſick brings on a very malignant putrid Fever, or a Dyſentery, or a complication of both; the contagion of which ſoon becomes very active and communicable.

Several caſes, both by land and ſea, relative to ſuch infections, are taken notice of by Pringle, Huxham, Lind, and others; and the like obſervations have been made by the phyſicians and ſurgeons of the Dutch forces, which ſerved as Auxiliaries to the Empreſs Queen, from 1743 to 1748.

Among others, I am acquainted with every circumſtance in the caſe of a perſon,

ſon, who, after contracting the infection, happily recovered; whilſt to ſome others, who very probably were infected by him, it proved fatal(1).

4. The alternate ſucceſſion of the morning and evening breezes, and that greater force with which the air is generally agitated in the Weſt Indies than in Europe, ſeem to be gracious diſpoſitions of the Ruler of the univerſe, indiſpenſibly neceſſary for maintaining a ſtated and frequent return of that cool temperature, whoſe effects are ſo ſalutary, that the Plague, the moſt dreadful of all viſitations, never has been known in thoſe climates.

On the other hand, however, it muſt be acknowledged, the evening breeze has been found pernicious, by forcibly propelling the cold and copious dews of the night againſt the bodies of thoſe, whom neceſſity, accident, or temerity, expoſes to them. This, immediately diſperſing the warm air which before environed them,

(1) This circumſtance relates to my own caſe, when in the autumn of the year 1743, I had the putrid Fever with a Dyſentery, in a very dangerous manner.

imparts, at firſt indeed, the ſenſation of an agreeable, but deceptive coolneſs, as it ſoon contracts the ſkin, ſtops the pores, and of courſe, directly obſtructs that perſpiration, which is ſo abſolutely neceſſary to health.

XLIX. Secondly, We now come to conſider, how far the uſual aliments of ſeamen contribute to engender, as it were, and to increaſe putrefaction. The rancid bacon, ſwarming with maggots, ſtrong butter, rotten and verminous cheeſe, damaged peaſe and biſcuit, either mouldy, or ſwarming with weavils (1), and other vermin, with the oatmeal in no better ſtate, is too truly and too often the condition of theſe proviſions in Weſt-India ſhips. This renders them ſo far from being nutritive, that they produce a putrid acrimony in the ſtomach and bowels, and thence infecting the juices, engender putrid diſeaſes. The inſtances of ſuch calamities are but too numerous in ſeamen, during

(1) Concerning the weavils, Dr. Lind obſerves, they are found to be very unwholeſome, and to have ſuch a cauſtic quality, as when applied to the ſkin in the form of a poultis, to raiſe bliſters like the Cantharides. Part ii. chap. iv.

long

long voyages; in the gariſons of beſieged fortreſſes; and in times of long dearth, when men are reduced to an abſolute neceſſity of uſing ſuch aliments.

If, on the contrary, all the proviſions be preſerved ſound and fit for uſe, the putrefaction, as an immediate effect of the *farinacea*, or of the bacon and ſtock-fiſh, merely as ſuch, is not much to be apprehended; and the people, if no other morbific cauſe ſupervenes, continue in a healthy ſtate; which, beſides the ſuffrage of experience in its favour, is pretty evidently confirmed by a compariſon of the ſecond and fifth inferences of my experiments (X). It ſhould, however, be obſerved at the ſame time, that theſe aliments being hard, and difficult of digeſtion, require the action of a ſound ſtomach, &c. to reduce them to a good chyle; and of courſe, if received into a weak ſtomach, where they undergo but a very ſlender alteration, the chyle produced from them muſt be crude, imperfectly elaborated, and from the nature of the farinaceous ſubſtances, and of the cheeſe, derive a ſlimy quality; from that

of

of the bacon and butter it becomes rancid; and the fiſh imparts to it the principles of putrefaction; whence the firſt ſeat of theſe diſeaſes is in the *primæ viæ*. Secondly, for want of a proper action of the chylopoietic organs, (*i. e.* the ſtomach and ſome other bowels) the chyle, beſides its deficiency in quantity, is not duly concocted; and thus is protruded into the lacteal veſſels with more difficulty.

Hence the material cauſe, the very foundation of our daily ſubſiſtence and repair, is both diminiſhed and depraved; a complete and ſalutary recruit of which is neceſſary to preſerve our fluids in their requiſite ſmoothneſs and conſiſtence; and to prevent that putrefaction to which they are otherwiſe naturally diſpoſed. Beſides, on the partial arrival of this imperfect chyle into the maſs of blood; if the general ſyſtem of the ſolids partakes, as uſual, of the debility of the concoctive organs, ſuch a crude chyle is leſs percolated through the ſmaller veſſels, and leſs intimately blended with the fluids; from whence it proves leſs aſſimilable to the body, and leſs adapted to repair thoſe

abraſions

abraſions of the veſſels, and of the fibres, which are occaſioned by the conſtant circulation of the blood, and the friction of the ſolids.

The natural conſequence of all which is, that the chyle, for want of that degree of perfection requiſite to nutrition, and through a deficiency of the quality proper to conſtitute and elaborate the perſpirable matter, to a ſufficient tenuity, for its being diſcharged through the pores; much, I ſay, of this inſufficiently elaborated chyle remains in the blood, where it degenerates more and more; and thus the juices, for want of due and proper recruits, ſuffer an alteration, and become putrified, much after the ſame manner as in thoſe miſerable people, who have periſhed by famine.

If (whatever be the acceſſory cauſes) ſuch putrefaction ſpeedily increaſes with an augmenting acrimony, the conſequence is a malignant Fever; but if it advances more inſenſibly, with a ſlowly increaſing relaxation of the ſolids, a Scurvy is the uſual conſequence.

It muſt be very obvious, then, that ſeamen are expoſed to the greateſt dangers of this laſt diſeaſe; if immediately after their recovering from the putrid Fever, and while they are ſtill weak, they are reduced to eat of the ſhip's ordinary proviſions.

L. Thirdly, If we conſider the drinking water, which at ſea and in the hot climates is generally tainted, and ſometimes verminous (beſides the incident neceſſity of watering in ſome places where that element is naturally impure and unwholeſome) we ſhall infer this article of bad water, in long voyages, may well be claſſed, among the collateral cauſes, at leaſt, of putrid diſtempers; eſpecially, when greedily drank by ſeamen, in whom the heat, labour, and ſalt proviſions, concur to excite an impatient thirſt(1).

This circumſtance, I believe, will be thought to ſtand in no need of explication or arguments.

(1) I have often ſeen a man drink four or five cups of water ſucceſſively, after a ſalt beef dinner, each cup about half a pint. Biſſet, chap. ii. p. 50.

LI. Fourthly,

LI. Fourthly, the principal among the improper and pernicious remedies in putrid diſtempers (meer relaxatives univerſally excepted) are mercury and alcalious medicines, whether lixivial, or terreſtrial and abſorbent.

Hartman (1) is held to be the firſt who detected the bad effects of mercury in the Scurvy; in which opinion he has been followed by many great men of the preſent age, as Hoffman (2), Pringle (3), Huxham (4), Lind (5), and particularly Van Swieten; who has publickly animadverted on the illuſtrious Boerhaave himſelf, concerning the uſe of mercurials in the Scurvy (6); theſe gentlemen all agreeing, that its power chiefly conſiſts in weakening and relaxing the ſolids, and in attenuating and diſſolving the fluids.

Thus, in the Scurvy, a very ſmall quan-

(1) Jo. Hartmanni Prax. Chymatric. Genev. 1633. p. 89.

(2) Fr. Hoffmanni Medic. ration. ſyſtem, tom. iv. p. 5. 54.

(3) Pringle, append. paper iv. exp. xxvii. p. 395.

(4) Huxham, l. c. p. 46.

(5) Lind. l. c. part ii. chap. ii. p. 154.

(6) Van Swieten Comment. in H. Boerhaave, aph. de cogn. et curand. morb. tom. iii. p. 632.

tity

tity of mercury brings on a ſalivation (1).

What Mr. Kramer, in his *Caſe of the Imperial troops in Hungary*, ſays on this head, is very remarkable; "four hundred of the troops at Belgrade, having taken mercury without my advice, the dreadful conſequence was, that they all to a man died in a ſalivation (2)."

Hence, poſſibly, we are to look for the cauſe, why, after uſing mercury in venereal diſorders, the Peruvian Bark loſes a great part of its known efficacy in the moſt virulent caſes (3).

As to the alcaline and terreſtrial abſorbents of acidity, we learn from Pringle's experiments:

That chalk (4) in abſceſſes (5), and that oyſter-ſhells alſo (6), promote putrefaction.

(1) Lind, l. c. part ii. chap. ii. p. 163. 172. chap. v. p. 248. But concerning this judicious Writer, it is obſervable, that after condemning the uſe of mercury for ſcorbutic ulcers, he recommends it in compariſon of ſudorifics, p. 259.

(2) Lind, l. c. part iii. chap. ii. p. 417.

(3) Journ. de medic. tom. x. p. 214.

(4) Pringle, l. c. append. paper iii. exp. xxiii.

(5) Id. l. c. append. paper iii. exp. xxiii. paper iv. exp. xxvi. paper vi. exp. xl.

(6) Id. l. c. append. paper iv. exp. xxvii.

That

That crabs-eyes being mixed with ſalt of wormwood, the putreſcence was much leſs; the ſalt having, after three days warm digeſtion, neither tainted nor ſoftened the fleſh; whilſt the levigated chalk had greatly putrified and conſumed it (1).

That egg-ſhells, added to water, ſeem rather to reſiſt putrefaction, preſerving meat longer than pure water (2).

That the antiſeptic virtue of the *contrayerva* root is weakened by the addition of ſuch alcaline medicines, and ſuch earthy ſubſtances (3).

That on a tendency of the humours to putreſcence, the uſe of them, far from being a matter of indifference, is extremely pernicious (4).

That the *fœtor* or ſtink, in a carious bone, is not to be ſuppoſed to reſult from the marrow; but (other cauſes included) rather to the oſſeous matter, which, being an abſorbent earth, may act like chalk, or the *teſtacea*; and ſo may heighten the pu-

(1) Pringle, append. paper iii. exp. xxiii.
(2) Idem, append. paper iii. exp. xxiii.
(3) Idem, append. paper iv. exp. xxvii.
(4) Idem, append. paper iv. exp. xxvii.

trefaction

treſaction both of the ſmall veſſels, and of the matter iſſuing from the ſore; ſince the corruption of marrow tends more to the rancid, than to the cadaverous ſmell (1).

And that chalk is by no means proper for, but rather hurtful in, a Dyſentery (2).

LII. Fifthly, exceſſive motion or labour increaſes the velocity, and conſequently the heat, of the blood; to which I alſo add, the ſailors' being in a continuance of ſtormy weather, and totally debarred the refreſhment of ſleep, which, in ſuch a life as theirs, is ſo comfortable, and, indeed, neceſſary.

It is an obſervation of Dr. Schwenke's, from an experience on himſelf, and when in perfect health, that the number of the ſtrokes of his pulſe, from ſix o'clock in the morning until one in the afternoon, amounted to between fifty-five and ſixty-five in a minute; but at eleven o'clock at night generally aroſe to eighty; that even this number, after running or uſing ſome briſk exerciſe, was augmented to near a hundred and thirty, or a hundred

(1) Pringle, append. paper vii. exp. xlvii.
(2) Idem, part iii. chap. vi.

and

and forty (1); and, farther, that the heat of his body aroſe to ninety-five degrees by the thermometer, and at ten o'clock at night was mounted to ninety-ſix (2).

Thus, from a great increaſe of corporeal motion, and a long want of repoſe and ſleep, the ſame conſequences are to be expected as from Fevers, the nature of which conſiſts in an accelerated circulation of the blood, attended, of courſe, with an exceſſive heat; whence an enſuing putrefaction in the humours; even as a hare being ſhot, after being courſed a conſiderable time, becomes ſooner tainted than one that has been killed in its form.

It muſt be admitted, however, that in in a perſon, who is kept waking a very unuſual length of time, the diminution of the animal ſpirits cauſes a faintneſs in the motion of the heart and arteries; which obſtructs perſpiration, relaxes the fibres, and ſharpens the humours.

Mr. Grainger, ſurgeon of a regiment then quartered in the Highlands of Scotland, in a letter to Dr. Lind, ſays, the

(1) Th. Schwencke Hæmatologia.
(2) Idem, p. 43.

Scurvy began in March, raged in April, declined in May; and left us before the middle of June. During that period, he had ninety ſcorbutic patients at Fort William, while there were only two ſoldiers, out of four companies, ſeized with it at Fort Auguſtus; and but one in a Captain's command, at the barracks of Bernera. No officer had it in any of the three; and this great diſparity the Doctor partly imputes to the duty being much harder at Fort William, than at the two other gariſons (1).

In conſequence of which Dr. Lind is poſitive, that nothing more retards the recovery of a ſeaman, weakened by any preceding ſickneſs, than compelling him to do his uſual duty, from a falſe and vulgar notion, that this will preſerve him from the Scurvy (2).

LIII. Sixthly, On the contrary, too much reſt and ſluggiſhneſs is more common on board ſhips of war, the men often ſleeping the whole time they are off the watch.

(1) Lind, part ii. chap. ii.
(2) Idem.

The

The inſalutary conſequences of a want of proper exerciſe, and of too much ſleep, are a retardment, and partial obſtruction of the circulation of the blood, firſt in the ſmaller veſſels, and then gradually in the larger; a ſtagnation of the humours; in ſome places a degeneracy of the juices; the excretions and ſecretions prove imperfect, and are impeded with an enſuing relaxation of the ſolids; and the food being but ill digeſted, becomes corrupted from its long retention in its firſt paſſages; whence, laſtly, an unwholeſome and putrid accumulation of the fæces.

This, in particular, by obſtructing inſenſible perſpiration, according to Pringle (1), and Huxham (2), greatly diſpoſes the conſtitution to Fevers; and both Gaubius (3) and Lind (4), hold it to be no leſs introductive of the Scurvy.

For this reaſon it is, that theſe patients whoſe extreme weakneſs, after ſome violent diſtemper, will admit of but very

(1) Pringle, part ii. chap. ii. iii. append. paper i. exp. iii.

(2) Huxham, l. c. p. 25.

(3) Gaubius, Pathol. §. 515.

(4) Lind, part ii. chap. iv. part iii. chap. ii.

little motion, are moſt ſeverely handled by the Scurvy; which alſo very haſtily increaſes in them, if they perſiſt in their liſtleſs averſion to moderate exerciſe.

LIV. Seventhly, Melancholy is obſerved, of all the paſſions, moſt to relax the fibres; to retard the fluids; to weaken the ſtomach and bowels, and to prevent perſpiration, thus producing Fevers, and eſpecially the Scurvy.

Hence it is, that ſuch preſſed men, on board men of war, as lay their condition grievouſly to heart, are much more ſubject to the Scurvy, than thoſe who ſerve chearfully (1).

(1) Dr. Huxham concludes his method for preſerving the health of ſeamen, with theſe ſentiments equally judicious and benevolent. "This, indeed, may be deemed a very expenſive project; but, where the lives of ſo many brave and uſeful people are in the caſe, I think the coſt ſhould by no means come into competition with the advantages that may be received from it: the Romans conſtantly carried vinegar and wine in their fleets and armies; and the common ſoldier and ſailor daily partook of both: nay, they were at many other conſiderable expences to preſerve the health of their armies; and now if that glorious, prudent people, thought the life of a ſoldier ſo valuable, why ſhould not we have as much

LV. Eighthly,

LV. Eightly, Coſtiveneſs, if the fibres be in a relaxed ſtate, and the humours already incline to putrefaction, is, above any circumſtance, introductive of putrid diſeaſes; the uſual ejection of ſuperfluous and corrupted matter, partly effected by the digeſtion of the aliments, and partly carried out of the blood with the excreted juices, being then much more neceſſary than at any time: as, in ſuch a ſtate of the body, the inſenſible perſpiration is not ſeldom obſtructed, the conſequences of which are comparatively leſs, if nature, by the communication between that diſcharge, and the groſſer evacuation by the inteſtines, effects, thro' the laſt paſſage, a diſcharge of thoſe ſuperfluities; of which, as very pernicious to the body,

regard to a ſailor, who is altogether as uſeful to the commonwealth?

I cannot conclude without taking notice, that the uſual method of impreſſing ſeamen, on their return from long and tedious voyages, void of neceſſaries, and chagrined at not ſeeing their friends and families, hath been the bane of thouſands: and I could wiſh, for the honour of the nation, and the benefit of the marine, a method of manning our fleet could be found out, more conſiſtent with common humanity and Britiſh liberty."

it endeavours by all means to exonerate itſelf.

The effects of ſuch oppilations, or obſtructions, are, eſpecially in the Weſt-Indies, the Chocolate-Sickneſs, preternatural, and extremely painful ſtools, ſometimes ſanious, or a Flux, occaſioned by the acrimony of the matter; alſo exceſſive ſtimulations of the bowels, or elſe a Fever, if ſome of this feculent matter ſhould find its way into the blood through the lacteal ducts, or any other abſorbent veſſels; which, as we have ſeen before (XLVI.) becomes an additional and aggravating cauſe in haſtening putrefaction and malignant Fevers.

It has been obſerved, that perſons under a Dyſentery generally eſcape the putrid Fever; and when it happens, that they have both, it is alternately, the Fever ceaſing, on the appearance of the Dyſentery, and returning, when the latter diſappears.

That too great an acervation of excrementitious matter feeds the putrefaction in malignant Fevers.

That

That the greenneſs, accounted a certain mark of putrefaction, is in dead bodies firſt ſeen in the bowels, and parts adjacent to the excrements, which promote the putrefaction of ſuch parts.

That coſtiveneſs, or oppilations in the excrementitious paſſages, is not only frequently a forerunner of Fevers, but alſo generally accompanies them.

That in ſuch a caſe, the face not ſeldom appears ſwelled, or bloated, as the bowels, diſtended by the excrements, compreſs the large deſcending artery, and the heads of the arteries of the abdomen; from which circumſtance the blood, meeting with leſs reſiſtance upwards, directs its courſe thither.

That patients, in the firſt ſtage of remittent ſummer diſeaſes, or putrid Fevers, on the failure of proper diſcharges by ſtool, fall into a continual Fever, and ſometimes turn yellow.

LVI. Ninthly, the obſtruction of inſenſible perſpiration, or of ſweat, alſo greatly conduces to the production of putrid diſtempers; ſince, however the habits of the body may be diſpoſed thereto; yet,

without the acceſſion of this determining cauſe, the Fever ſeldom ariſes to a great and evident degree. But on conſidering, firſt, the noxious quality of the perſpirable matter, which, if it be not already in a putreſcent ſtate, nor diſpoſed to one by any exceſſive heat of weather (when nature uſually eliminates it through the pores) yet becomes putreſcent by its longer detention in the blood: and if, at the ſame time, we take into the account, the great quantity of thoſe effluvia, or exhalations, it may eaſily be conceived, that this retained putreſcent vapour, or matter, acting like yeaſt on the juices, eſpecially on the bile, (which in all hot countries, if not ſuperabundant, is at leaſt very acrimonious, and as ſoon taints, tho' its putreſcence be not ſo ſtrong as that of blood and fleſh) dangerous, putrid diſeaſes muſt neceſſarily be the reſult in hot countries; and theſe diſeaſes will differ in their ſymptoms and degrees, according to the conſtitution of the perſon, or the nature and influence of other acceſſory cauſes.

If then, the ſolids being relaxed, and the fluids tending to putrefaction from other

other cauſes (which, in the torrid Zone, is more than generally the caſe) this diſcharge by the external pores be immediately ſtopped, and that throughout the whole ſurface of the body in the Weſt-Indies; this obſtruction produces violent putrid Fevers, which only vary in degree from our Summer and Camp-diſeaſes, known by the appellation of gall or bilious diſtempers.

Sometimes this diſtemper throws itſelf on the bowels, attacking them under the appearance of an acrid and corrupt bile, and thus brings on a Cholera, Dyſentery, or Chocolate Sickneſs.

If the putrid Fever continues, it becomes (as I have obſerved of an infarction and obſtruction in the excrementitious paſſages) the cauſe of an increaſe and aggravation of putrefaction; from which the yellow Fever, ſo common and fatal in the Weſt-Indies, the ſpotted malignant Fever, the Siam Sickneſs, or gangrenous malignant Fever, frequently deduce their origin.

As a complete unobſtructed perſpiration conſtitutes the principal diſcharge, by which the blood can free itſelf from

all

all peccant particles, as well thoſe generated within, as thoſe it may have imbibed by external contagion, it follows, that theſe laſt muſt prove much more active and noxious, when that out-let, whatever be the cauſe, is ſuddenly obſtructed; ſo that it becomes an introductory or collateral cauſe of great exacerbations in malignant Fevers, contracted by infection.

The putrid matter alſo produced by aliments, &c. (XLIX. §. 2.) when not ſufficiently diſcharged by perſpiration, becomes, from its retention and increaſe in the habit, an occaſional cauſe of the Scurvy.

As to every circumſtance, which has any conſiderable tendency to produce ſuch obſtructions, theſe have been already curſorily mentioned, in the inveſtigation of the other cauſes.

LVII. Tenthly and laſtly, profuſe ſweats not only weaken, but even diſſolve, the requiſite coheſion of the ſerous parts of the blood with the red globules; which confuſing and inſpiſſating, in ſome degree, the other ſecretions, impedes their paſſage,

and

and excites, on the over-diſtended pores, a dangerous ſenſation of cold.

LVIII. Hitherto I have taken an attentive ſurvey of the proximate cauſes of the diſeaſes uſually incident to ſeamen, in Weſt India voyages; together with their remoter ſeeds, and all the noxious powers that either produce or inflame them: And herein I have deſignedly omitted the different and contradictory opinions, which I have met with in the courſe of my reading; and which render the enquiry ſo diſagreeable and perplexing, that a diſcuſſion of the points debated would prove extremely difficult. This at firſt determined me to introduce the many different opinions on this head, with diſtinct confutations of them, in this performance: but reflecting that this would extend it much beyond the uſual limits of a Memoir, I deſiſted, though no ſmall part of ſuch inſertions, with my animadverſions on them, had already been committed to paper.

LIX. The ſource of theſe differences appears principally to ariſe from hence, that (which, indeed, is very common) the

the neceſſity of the concurrence of a predispoſition with one, or, as is generally the caſe, with many external cauſes, has been quite overlooked.

For the heterogeneity of the Torrid Zone, heat, moiſture, cold, want of freſh air, freſh herbage and garden ſtuff; the coarſe aliments, ſtinking water, laſſitude, profuſe ſweats, the length and duration of the voyage, &c. are not ſingly, or even conjointly, ſufficient in themſelves: though whenever exerted on bodies prediſpoſed to putreſcence, they bring on ſome of the Fevers already mentioned, or the Scurvy.

Thus, for want of attending to all the ſeveral acceſſory circumſtances, ſome have abſolutely ſet aſide, what by others is held an efficient cauſe, or exacerbating concomitant, though both ſides appeal to experience: ſome again, by a like negligence, have attributed the diſtempers to ſomething antecedent. Thus it has been pretended that brandy, diluted with water, engenders the Scurvy; but with equal reaſon might it be imputed to Malaga wine; becauſe, after drinking freely of that

that wine, a perſon may have happened to become ſcorbutic.

Further, originally to cauſe a diſeaſe, or to increaſe it after it has manifeſted itſelf, are two different things; ſince ſome cauſes muſt co-operate at the ſame time, and their action be very forcible (as the ſame diet is ſometimes innoxiouſly uſed for a conſiderable term, without intermiſſion) before a manifeſt diſeaſe reſults from it; the effects of many other cauſes being pernicious in ſuch diſtempers, and this is particularly applicable to the Scurvy.

LX. It will be ſuperfluous to deduce all the types of the three diſtempers from relaxations in the ſolids, attenuations in the fluids, and from ſuch affections of the nervous ſyſtem, throughout the whole machine, as may be cauſed by an inflammation in the brain, or by the confinement of feculent matters in the firſt paſſages.

LXI. Having thus gone through the firſt article of the queſtion, my concluſion is,

That

That the diſeaſes uſual among ſeamen in Weſt-India voyages, are not Fevers accompanied with inflammations, in one part of the body, but violent putrid Fevers, malignant Fevers, and the Scurvy.

That it is only in degree, and not in nature and quality, the diſeaſes in queſtion differ from thoſe obſerved to prevail in Europe, and particularly in the Netherlands.

That a putrefaction, conſiſting in a relaxation of the fibres, and a diſunion or degeneracy of the juices, is the proximate cauſe of all; differing, however, in the ſeveral modes of exiſtence, in proportion as they depend on the particular degree, the force, and concurrence of external cauſes.

That when, by a ſtrong and manifeſt tendency to putrefaction, whether occaſioned by ſuch a propenſity of the natural conſtitution, by the moiſt and hot temperature of the Torrid Zone, or by the uſe of vitiated or putreſcent aliments, verminous water, &c. the inſenſible perſpiration is greatly diminiſhed, or entirely ſtopped (to which morbid circumſtance,

in

in thoſe parts, men are greatly expoſed, from the coldneſs and the dampneſs of the nights) then, I ſay, Fevers are engendered.

Next, that a putreſcent ſubſtance being, by a violent increaſe of the putrid Fevers, or by the infectious air, ſtill further elaborated to a certain degree of acrimony, and mingled with the blood, it inflames the whole body, after the manner of a ferment, or yeaſt, diſſolves the craſis and coheſion of the fluids, and being attended by an inflammation in the brain, malignant Fevers are the conſequence.

Finally, it has been obſerved, that it is chiefly on the return of ſhips, that habits inclinable to putrefaction become inveterately infeſted with that terrible diſtemper the Scurvy: as they muſt be reduced to a greater degree of weakneſs by the long continuance of the cauſes already enumerated; whence neceſſarily follows a greater liſtleſſneſs to, and, indeed, a greater inability for, voluntary motion. Beſides, nutrition becoming extremely depraved from the daily increaſing corruption of both their ſolid and liquid food,

inſenſible

inſenſible perſpiration is continually more and more diminiſhed.

CHAP. VII.

Of the Cure.

LXII. AFTER theſe endeavours to give the honourable Society a ſatisfactory anſwer to the firſt clauſe of their Queſtion, I now proceed to the ſecond, which contains two diſtinct articles, the Cure, and the Prevention of the uſual diſtempers at ſea.

In this chapter I ſhall only conſider the former, reſerving the latter for the concluſion.

LXIII. It is a ſaying of Hippocrates, "That the knowledge of a diſtemper "leads to a knowledge of the proper re-"medies." Laying, therefore, my foundation on theſe premiſes, I conceive that the three diſeaſes in queſtion may, from the cloſe affinity of their nature and their cauſes, be included under one identical method of cure.

LXIV. This method of cure regards either the total and abſolute extinction of

of the diſeaſes themſelves; the removal of the cauſes, or morbific powers; or the abatement and diminution of their principal and ſevereſt ſymptoms.

For the accompliſhment of the firſt, the following indications muſt employ the Surgeon's continual regard, and regulate his conduct.

1. That the peccant acrimony and putrid ſubſtances are to be ſeparated and diſcharged.

2. Or elſe that they be corrected or mitigated: and,

3. That the vital powers be corroborated or reſtored.

LXV. To the firſt view, the general evacuations by phlebotomy, emetics, purges and ſudorifics, have been ſuppoſed to ſuffice.

With regard to Phlebotomy, however, it is generally found to be leſs neceſſary in (1) hot countries and ſeaſons, than in

(1) Agreeable to this, M. Van Swanten writes, "That at Batavia he often found much bleeding "quite unneceſſary in common Fevers; and ſome- "times very detrimental, by attracting the feculent "matter from the *primæ viæ* into the blood; on

the cold; and its benefit in putrid diſtempers is probably very limited, being proper only in the firſt ſtages of putrid Fevers, Dyſenteries, and malignant Fevers caught by contagion: and even then, if the patient ſhould be of a ſanguine, vigorous conſtitution, with a full and ſtrong pulſe; from which circumſtances the diſeaſe will appear more or leſs to partake of an inflammatory nature; even then in the two firſt diſtempers, this operation is generally performed only once; and, in the laſt, the quantity of blood taken away is very ſmall.

In ardent and putrid Fevers, the acceſs and increaſe of which are ſudden, and attended with violent head-achs, immediately followed by ſtrong deliriums, the lancet has been found indiſpenſibly neceſſary.

In doubtful ſymptoms, it is a good method to feel the pulſe whilſt the vein is opened; and to regulate the quantity to be taken away by the variation in the force or feebleneſs of its vibrations.

" which account he had long before relinquiſhed " the cuſtomary practice of taking away a great deal " of blood, as in truly inflammatory diſeaſes.

With

With regard to the timing of veneſection, whether in the height, or in the remiſſion of the paroxyſm, this ſeems leſs material than the neceſſary circumſtance of bleeding very early in the diſeaſe.

It muſt, however, be acknowledged, that, upon the whole, the pernicious effects of bleeding in putrid Fevers is atteſted by a great number of the moſt celebrated phyſicians, as Hippocrates, Aretæus, Celſus, Alexander, Fernelius, De Gorter, Glaſs, Bianchi, Junker, Huxham, and many others. Dr. Tiſſot (1), particularly, has lately demonſtrated this beyond all manner of doubt, not only from the authorities already mentioned, and thoſe of ſome eminent writers beſides; but principally from the experience of others, and his own, in many curious and convincing obſervations, ſupported by the moſt ſolid arguments: All this, I may affirm, perfectly agrees with my own uniform manner of treating the like Fevers, which have occurred to me in the courſe of my practice. Dr. Pringle calls the hæmorrhage in the Dyſentery, a deceitful indi-

(1) Tiſſot Diſſ. de Febribus Bilioſis, p. 121. 157.

cation, if ſuppoſed to demand repeated bleedings: Since, on the contrary, he warns practitioners againſt ſuch a practice, and plainly ſignifies, that if it be not uſed with great caution, it tends more to augment than to cure the diſeaſe.

Laſtly, it is accounted in general pernicious, to the higheſt degree, in malignant Fevers, when arrived to their ſtate, or ſecond ſtage, and alſo in a confirmed Scurvy.

LXVI. But with regard to other evacuations, the diſcharge or expulſion of putrid ſubſtances by emetics and purgatives, in putrid Fevers, is of acknowledged and eſtabliſhed benefit, in conſequence of which it has been recommended by phyſicians of the greateſt experience; and that not only becauſe nature itſelf points it out, by nauſeas, by ſpontaneous vomiting, the Cholera, Flux, &c. thus taking the ſame way to prevent a remittent or intermittent Fever, by the ejection of ſuch putreſcent ſubſtances out of the bowels, and by thus preventing their commixture with the blood (whence the diſeaſe might degenerate into a continual yellow

yellow and malignant Fever) but likewiſe, becauſe experience teaches us, that the omiſſion of it gives a worſe aſpect to every ſubſequent ſymptom: and becauſe, when duly adminiſtered, their conſequences are found to be highly beneficial.

Dr. Pringle (1) in proving, that wherever putrid Fevers occur, they are always the ſame diſeaſes, ſays, "In Guinea, if dur-"ing a remitting Fever, a diſcharge of "the putrid Bile be not made in time, "the diſtemper aſſumes the form of a "continual and malignant Fever; the "pulſe ſinks, and a delirium comes on, "which is generally fatal."

Were more authorities requiſite, I could prove this opinion to have been countenanced by the greateſt men in all ages. Whoever only reads what the very learned Dr. Glaſs (2), who illuſtrates Hippo-

(1) Pringle, part iii. chap. iv. where he adds, "In that country, the rainy ſeaſon begins about "the end of April, and continues until paſt June, "in which period, Fluxes and Fevers are very fre-"quent, and no leſs on board the ſhips lying "off the coaſt than on ſhore, but do not affect ſuch as "keep out at ſea beyond the limits of the foggy air.

(2) Glaſs, Comment. de Febribus. Lond. 1742.--p. 95---125.

crates by Hippocrates, has ſaid on this ſubject, will, I am perſuaded, readily acquieſce in the explanation he gives of the word ὀργᾶν, *turgere*, which occurs in the twenty-ſecond Aphoriſm of the firſt Book: where that writer not only ſhews, that Hippocrates there, and in other places, by no means repreſents thoſe remedies as ſeldom or never neceſſary (as a noted writer has lately aſſerted, though in general terms, and without taking the leaſt notice of that celebrated Engliſh writer; even while he himſelf predicates the eminent, and extenſive benefit of them in Fevers) indicating at the ſame time the diſtinct uſe of them by ſymptoms, which direct, when emetics are to be adminiſtered, and when purgatives.

A copy of a Latin letter, which I have now by me, dated the 11th of November, 1727, and addreſſed by the great Boerhaave to his friend Mr. Beſtaud, has theſe words, "This autumn has been "unhappily diſtinguiſhed here, by a ge- "neral and very malignant Fever, which "has proved fatal to great numbers; all "the adjacent places being full of ſick "people.

" people. Though it is a long time ſince " I have left off practice, I never had ſo " many patients on my hands; however, " by the uſe of emetics, &c. I have had " the pleaſure of ſeeing them all do well."

On reviſing the notes I made during my attending the lectures of Mr. Oogler-dyk Schacht, Profeſſor at Leyden, I find that great man has obſerved, " That eme- " tics were generally very ſucceſsful in " the autumnal Fevers of 1720, and " 1727." As a moſt remarkable confir-mation of the great propriety of emetics in ſuch caſes, this learned Profeſſor, my highly reſpected Maſter, ſays in another place, " It happened in the month of " Auguſt 1729, when only in one day, " above two hundred perſons applied to " me for advice in ſuch Fevers, and by " means of the Ipecacuana they all reco- " vered."

My own experience has further con-vinced me of the utility of ſuch a me-thod, having uſed it in a great number of ſummer Fevers, and having ſeldom failed of the like happy conſequences; ſo ſpeedily checking the progreſs of the

malignity, that on a manifeſt turgeſcence of the putrid matter, which is commonly the caſe, I never depart from this method; unleſs with regard to particular conſtitutions, or for other very cogent reaſons.

Is it not running too great a hazard, and that probably for want of making a few right diſtinctions, totally to explode emetics and purgatives in ardent inflammations, and ardent putrid Fevers? Should any one, after only a ſuperficial acquaintance with the Peruvian Bark, condemn it, is his authority to prevail above that of another, who, from a thouſand happy trials, has had an intimate and certain knowledge of its excellent effects?

However, if ſuch a Fever has continued for ſome time, or has been neglected at the beginning, or from an intermittent is forming itſelf into a continual Fever, or is attended by an inflammation, then, indeed, I muſt acknowledge emetics, and other copious evacutions, to be very detrimental.

Laſtly, that a malignant Fever by infection may be ſtifled in its birth, or arreſted

reſted in its progreſs, an emetic, together with other remedies, is recommended in the beginning, but not after ſome continuance of the diſeaſe; and, in caſe of a conſiderable coſtiveneſs, care muſt be taken to keep the body open; as the diſcharge of bilious matter, or excrements, towards the laſt ſtage of the diſeaſe, is accounted a very promiſing appearance.

In the Scurvy emetics are judiciouſly avoided, as they increaſe the pains, the proſtration of ſtrength, the difficulty of breathing, and the bleeding at the noſe, without mitigating any of the ſymptoms; beſides, that the ſtomach rarely needs any evacuation in this caſe: but a gentle opening purge, repeated about the third day, has been often attended with a good conſequence.

LXVII. With regard to emetics in violent putrid Fevers, with little ſenſible intermiſſion or remiſſion, and a propenſity to vomit, the Ipecacuana alone is uſed: but in ſuch as are ſenſibly remittent or intermittent, the preparations of antimony, either alone, or mixed with Ipecacuana, are preferred. I have often ſucceeded very

very well, by increaſing the emetic powder of the Ipecacuana with two grains of emetic Tartar; in which I am warranted by the authority both of Dr. Pringle (1), and Dr. Tiſſot (2); and, if theſe medicines be attended either by themſelves, or by their commixture with another, with a moderate operation alſo by ſtool, their ſalutary conſequences may be conſiderably augmented by it; ſince in fact it has frequently been experienced, that by ſuch a happy operation only, the danger has been immediately averted, and an entire recovery, under proper management, has ſpeedily enſued.

LVIII. As to aperients, working gently, without exciting much ſtimulation in the ſolids, or any conſiderable commotion in the blood; eſpecially if ſuch aperients are at the ſame time of an antiſeptic nature, as Manna, or Cream of Tartar; but above all Tamarinds, adminiſtered by intervals, in any form or manner, ſo as to effect and to continue a moderate laxity of the belly in the patients, are by far the moſt

(1) Pringle, part iii. chap. iv.
(2) Tiſſot, p. 33.

eligible

eligible in putrid Fevers. Where milk can be procured, which is not always the caſe at ſea, let Tamarind-whey be preferred to all other remedies.

In malignant Fevers, a moderately ſtimulating clyſter injected now and then, alone ſuffices to remove coſtiveneſs.

A ptiſan of Barley and Senna leaves, mixed with Cream of Tartar, or Sea-water, or a decoction of Tamarinds, or the Sea-onion, that is the ſquill, or the oxymel of ſquills, has been found to anſwer very well in the Scurvy; though frequently freſh greens and fruits effect a recovery, without any aſſiſtance from the *materia medica.*

LXIX. It has been obſerved, that in hot countries healthy people generally ſweat very much; and this, from the greater diſpoſition of the humours to putreſcence, may be accounted one of the principal preſervatives of health. A maſter of a ſhip aſſured me, that if he could but keep himſelf in a breathing ſweat, he always found he was healthy and alert. However, I entirely agree with thoſe writers, who, for irreſiſtible reaſons, forbid

the uſe of ſtrong, hot ſudorifics, unleſs as preſervatives.

A malignant Fever by contagion, and ſlow in its progreſs, has ſometimes been removed in its firſt ſtage by ſweating only.

The cure alſo is very much promoted, if in the further courſe of the diſeaſe, the free diſcharge be equably continued: notwithſtanding an exceſſive and impetuous expulſion of it is generally attended with bad conſequences.

Of all evacuants, however, thoſe which promote perſpiration, ſeem beſt adapted to the Scurvy.

It is obſerved, that, if a few days after the uſe of greens, a certain openneſs of the pores enſues, by which the teguments become ſoft and moiſt, this proves a favourable prognoſtic; and it may be conſidered as an intimation, from nature herſelf, of the patient's approaching recovery.

In remittent and intermittent putrid Fevers, when the ſweat is not proportionate to the heat, the *ſpiritus Mindereri*, given before the heat is over, may be of advantage,

advantage, as it operates without increaſing the motion of the blood. "I have," ſays Dr. Pringle, "obſerved in the hoſ-"pitals, that when men were brought "in from the camp with Fevers, nothing "ſo much promoted a diaphoreſis, as "waſhing their feet and hands, and ſome-"times their whole body, with warm "water and vinegar, and giving them "clean linen. So that officers judge right "for the health of the men, as well as "for their appearance, when they ſtrictly "require the cleanneſs of their perſons "and cloaths (1)."

In the early invaſion of malignant Fevers, the above-mentioned ſpirit alone often ſuffices; and for the times when, and the ſymptoms and circumſtances in which, muſk, volatile alcaline ſalts, ſnake-root, contrayerva, camphire, &c. are to be exhibited to promote perſpiration, no better Writer can be conſulted than Dr. Pringle, who has given a judicious and circumſtantial detail of all that relates to the exhibition of them.

(1) Pringle, part ii. chap. ii.

On

On the firſt appearance of the Scurvy, a decoction of barley with vinegar, or with inſpiſſated juice of lemons, adminiſtered as a gentle ſudorific, will have a benign effect.

Beſides the freſh greens uſed as food, and which alſo contribute to open the pores, a decoction of the freſh ſprigs of guaiacum, which may be eaſily procured in the Weſt-Indies, is much commended, as of itſelf conſiderably promoting perſpiration.

LXX. Though the diſcharge or elimination of the putrid humours is, as we have ſeen, very neceſſary in thoſe diſeaſes, yet that alone does not effect a cure; all the juices of our bodies being more or leſs affected by the corrupted matter. Therefore, the evacuants are to be aſſiſted with ſuch medicines as correct the putrid matter, that is, ſo far, as if not entirely to remove, at leaſt to diminiſh their noxious qualities.

LXXI. Such correctives are ſcarce to be enumerated. From among the ſeveral claſſes of medicines, many may be uſed of more or leſs efficacy, but a detail of them would

would far exceed the proper limits of a memoir or performance of this kind; and, I hope, it will be accounted ſatisfactory, if from each claſs I ſpecify thoſe, which are eſteemed antiſeptics, or potent reſiſters of putreſcence; after which I ſhall ſpeak more diffuſely of two particular remedies, which are judged to anſwer this ſecond indication above all others; and, laſtly, I ſhall treat of the beneficial uſe of wine, which, conſidered as a powerful antiſeptic and corrective, properly belongs, indeed, to this ſecond head; yet, as it has been generally directed to be uſed as a common and highly preſervative liquor, I ſhall reſerve it for the third, in order to avoid any needleſs repetitions.

LXXII. The ſaid claſſes are:

1. The diluents; and of theſe water and whey are the principal; ſince a dilution of the putrid ſubſtances, renders them leſs coherent, and promotes the expulſion of them; whence it is that patients under putrid Fevers are ſo extremely delighted, ſo conſiderably refreſhed, with thoſe liquids.

2. The

2. The vegetable acids, whether unfermented, as ſorrel, orange, and lemon juice, tamarinds, all kinds of fruits, and acid eſculents; or fermented, as Rheniſh or Moſelle wine, cyder, vinegar or alegar, oxymel, tartar, and the cream of tartar; vinegar-whey; butter-milk, &c.

Acids from minerals; as ſpirit and elixir of vitriol, ſpirit of ſea-ſalt, of ſaltpetre, &c. are likewiſe, as every phyſician knows, paſſionately coveted by ſuch patients; and their ſalutary effects have been demonſtrated by frequent experience, both in putrid Fevers and in the Scurvy: nevertheleſs to thoſe patients, whoſe bowels are weak and tender, ſuch remedies are to be adminiſtered with caution; on which account it is, that Dr. Warren, in his *Eſſay on the malignant Fevers in Barbadoes*, is of opinion, that in treating thoſe diſtempers, we are not to be too free with acids. (See Pringle, third edit. p. 274.): and from the trials made by Dr Lind, on twelve ſick men in the Saliſbury, an Engliſh ſhip of war, it appeared that, in the Scurvy, they are not all equally good. (See Lind, p. 191 to 196, and 258 to 265.)

3. Alcaline

3. Alcaline ſalts, whether fixed, as *cineres clavellati depur:* or purified pot-aſh, ſalt of tartar, of wormwood, &c. volatile ſpirit, and ſalt of hartſhorn, ſpirit of ſal ammoniac. Dr. Pringle, in recommending theſe, ſays, "Herein I rely "more on practice than theory."

Or alcaleſcent, and diſtinguiſhed by the name of antiſcorbutic, as *cochlearia*, or ſcurvy-graſs, water-creſſes, pepper-wort, muſtard, garlic, onions, leeks, red cabbage, ſquills, turnips, green ſprigs of pine, guaiacum, &c.

Dr. Pringle, contrary to the general opinion of phyſicians, has demonſtrated by experiments, that all the before-mentioned remedies are ſo far from promoting corruption, that they ſtrongly oppoſe it(1); one grain of volatile ſalt of hartſhorn having preſerved fleſh from corruption, better than four grains of culinary or rock-ſalt, and than two grains of vitriolated ſalt of tartar, or volatile alcaline ſalt of hartſhorn, ſaturated with vinegar(2).

(1) Pringle, append. paper ii. exp. ix.

(2) Idem, ibid. where the Doctor gives a curious table of the comparative powers of ſalts in reſiſting putrefaction, founded on his own experiments.

That putrid ſubſtances differ very widely from the alcaline, and acid.

4. Neutral ſalts; ſal ammoniac, common ſalt, ſea-water, ſal gemma, or rock-ſalt, ſaltpetre, ſoluble tartar, vitriolated tartar, the ſaline acid mixture of Riverius, *ſpiritus Mindereri*, ſugar, &c.

As to common culinary ſalt in particular, I ſhall only quote the following paſſage from Dr. Lind(1): "To two ſcorbutics, with very rotten gums, ſwelled "legs, and with the ſinews of the knees "contracted, I every day, for the ſpace "of a fortnight, gave half a pint of ſea-"water, with which they were very com-"plying, but it had no manner of effect "on them; they continued in the ſame "condition, even as if they had been left "to themſelves without any remedies "given them. This trial was ſeveral "times repeated, and here and there a "patient imagined he perceived ſome-"thing of a good effect from it: it ſeems "that the Scurvy can by no means be "imputed to the ſalt abſtractedly; though "affording no proper nouriſhment, it may

(1) Lind, p. 86---89. p. 111---115.

"be

" be looked on as one of the occaſional " cauſes of that horrid malady."

5. The bitters; contrayerva, gentian, rhubarb, ſnake-root, orange-peel, Weſt-India or white cinnamon, wormwood, the leſſer centaury, ſenna, myrrh, &c. are chiefly proper for thoſe who are on the recovery, either from Fevers or the Scurvy.

6. The aromatics; angelica, wild valerian, cinamon, mint, chamomile flowers, ſaffron, camphire, muſk, &c.

7. The aſtringents; oak bark, Peruvian bark, ground-ivy tea, red roſes, gall-nuts, catechu, alum, lime-water, red wine, &c.

LXXIII. Of all the before-mentioned remedies, the Peruvian bark, and orange and lemon juice, for their excellence, deſerve the name of ſpecifics againſt putrefaction.

As to the former, Dr. Pringle ſays, " That he put a piece of fleſh, weighing " two drachms, putrified in a former ex- " periment, and ſo ſpungy as to be ſpe- " cifically lighter than water, into a few " ounces of a ſtrong infuſion of chamo-

" mile flowers; the infuſion was renew-
" ed twice or thrice, in as many days:
" when perceiving the *fætor* gone, he put
" the fleſh into a clean bottle, with a freſh
" infuſion, and after a twelvemonth, it
" was ſtill firm and uncorrupted."

In the ſame manner, he ſucceeded in ſweetening ſeveral thin pieces of corrupted fleſh, by repeated affuſions of a ſtrong decoction of the bark.

Concerning its uſe in putrid diſtempers, it may be ſaid:

That it is found more neceſſary and beneficial in ſummer than in vernal putrid Fevers, and in hot than in cold countries; perhaps, from the greater relaxation of the ſolids at that ſeaſon, and in ſuch climates.

That in remittent putrid Fevers, the firſt paſſages being cleanſed, it may ſafely be adminiſtered during the ſweats, and at the ceſſation of them, particularly, if the urine be turbid.

That if, in the beginning, it be ſuſpected that a great deal of putrid matter has inſinuated itſelf into the blood, rhubarb is to be added to the bark, which, however,

however, is afterwards to be uſed ſimply, by itſelf.

That it prevents returns both of putrid Fevers, and of the Dyſentery.

That it is adminiſtered with good effect in malignant Fevers, either before the humours become ſo very much rarified, as to occaſion an inflammation in the brain, or afterwards, on the appearance of mortifications, or livid *petechiæ*, or ſpots (1).

And, that although many experiments further manifeſt its ſalutary operation towards the Cure of the Scurvy; yet this chiefly is, and oftenest happens, after the uſe of freſh eſculent vegetables, and the juice of the acid fruits, for ſome continuance.

(1) Beſides the learned Mr. de Haan, and others, Mr. Bon, my collegue in the Camp-hoſpital, has, after Dr. Pringle's example, tried the Peruvian bark in malignant Fevers, and found it highly beneficial. *Vide* Dr. Van de Kaar's Notes in his tranſlation of Baron Van Swieten's treatiſe of Camp-diſeaſes, p. 81.

I ſhould digreſs too far in giving a detail of many caſes within my own experience, and others of my medical acquaintance, all concurring to manifeſt the great utility of this valuable remedy in Fevers of this ſpecies.

LXXIV. With regard to orange and lemon juice; though all greens and fruits, almoſt indiſcriminately, are very remarkably conducive to the Cure of the Scurvy, thoſe juices muſt be acknowledged to have the moſt extraordinary and ſpecific efficacy in this caſe. So many inſtances are produced by Lind and others, in confirmation of this aſſertion, that a great confidence may very rationally be placed in their ſingularly ſalutiferous conſequences.

LXXV. But what more eſpecially demand our notice, are the trials made by the above-named gentleman (1) in the ſame ſhip, and at the ſame time, on twelve ſcorbutic patients, with very nearly the ſame ſymptoms, all lying in one birth, and all put to the ſame ſolid and liquid diet.

For the ſpace of a fortnight, beginning the 20th of May, 1747, he gave every day to each two, out of twelve patients, whom he divided into ſix pair or claſſes, as follows:

(1) Lind, part ii. chap. iv.

To

To the firſt two, he gave daily one quart of cyder.

To the ſecond, two ſpoonfuls of vinegar, three times a day upon an empty ſtomach: their gruels and other food were alſo well acidulated with it.

To the third, twenty-five drops of *elixir vitrioli*, three times a day, upon an empty ſtomach; they uſed alſo, during the ſame term, a gargle, ſtrongly acidulated with it, for their mouths.

The fourth pair were two patients very highly afflicted; having a ſtiffneſs of the tendons in the hams. Theſe took daily half a pint of ſea-water.

The fifth claſs had, each of them, two oranges and a lemon daily allowed them, which they eat with great avidity, at different hours, upon an empty ſtomach.

The laſt two remaining patients took the bigneſs of a nutmeg, three times a day, of an electuary made of garlic, muſtard-ſeed, horſe-radiſh, balſam of Peru, and gum myrrh.

The two who had made uſe of the oranges and lemons, were ſo readily relieved, that in ſix days one was able to

do duty; the ſpots on his body were not, indeed, totally vaniſhed, nor the gums reſtored to their natural ſoundneſs; yet, without any further help than a gargariſm, with ſome drops of *elixir vitrioli*, he was perfectly recovered on our arrival at Plymouth, the 16th of June. The ſecond likewiſe was ſo much more advanced in his cure, than all the others, in whoſe condition he had been, that, in a week's time, he was able to attend the other patients: Next to theſe, they to whom cyder had been given, were in the beſt ſtate.

In the remainder little alteration appeared in ſome ſymptoms, except that the gums, by means of a vitriolic gargle, were much mended.

Dr. Lind quotes part of a letter to himſelf, from a ſurgeon of an Engliſh ſhip of war, in the Weſt-Indies, which ſays: "As to oranges and lemons I have always found them, when properly and ſufficiently uſed, an infallible Cure in every ſtage and ſpecies of the diſeaſe, if there was any degree of natural ſtrength left; and where a Diarrhœa, Lientery, or Dyſentery, were

were not joined to the other ſcorbutic ſymptoms. Of this we had a moſt convincing proof when we arrived at the Daniſh iſland of St. Thomas, where a hundred and twenty patients, in all the different ſtages of this diſtemper, were cured in a fortnight by limes alone, little or no other refreſhments being to be had."

Matters, however, by all accounts, ſeem much mended, and both the Jamaica, and the Weſt-India ſhips, are more healthy than formerly; for which it is thought they are, in a great meaſure, indebted to the plentiful uſe of limes, in a liquor called *punch* (1), a mixture of the ſaccharine and acid.

The benefit of theſe fruits, in the Scurvy, extends to all ſtages and periods of the diſeaſe; and, how different ſoever their appearances may be, the uſe of them is ever ſafe and effectual; provided, however, there be not an utter proſtration of ſtrength, nor any Dyſentery nor Flux of any kind, according to the judicious ſurgeon above cited.

(1) The punch uſually drank in the Weſt Indies is rich of the fruit, and obtains more and more in the Spaniſh ſettlements.

To

To this it is objected, that, on ſhore, theſe fruits are far from conſtantly producing ſuch healing effects. In anſwer to which the ſame writer (1) obſerves, that this rather proceeds from confounding other diſeaſes with the Scurvy; which diſeaſes have no manner of relation to it; and he appeals to the (2) daily experience occurring among ſeamen, the journals of hoſpital ſhips, and the example of the Engliſh Eaſt-India ſhips, in oppoſition to the declared ſentiment of Boerhaave and others, that the Cure of the Scurvy is the *ne plus ultra*, the maſterpiece of the whole ſcience of medicine.

It has been often ſeen in that diſeaſe, that the ſick, when in extreme langour, and, as it were, at the laſt gaſp, revive at the very ſight of oranges and lemons, and eat them with a reliſh and ecſtaſy, eaſier to be imagined than deſcribed; when at the ſame time they avow the greateſt averſion to all kinds of officinal drugs, to all medical compoſitions (3).

(1) Lind, part ii. chap. iv. p. 203.

(2) Idem, ibid. p. 204.

(3) Of the happy effect of thoſe fruits, which will be ſpoken of more at large in the ſequel, I beg leave to give the following inſtance:

It

It is a very pertinent and pious reflection of the ſame author's, that theſe fruits, by a moſt gracious diſpenſation of the adorable Ruler of the univerſe, abound in an inexhauſtible exuberance all over the Torrid Zone, and throughout the whole year, as the pot-herbs and other eatable greens do in the ſummers of the temperate climates.

Some precaution, however, muſt be taken, that in the firſt days, the ſick men

" The year when that brave Admiral, Sir Charles Wager, commanded our fleet in the Baltic, his ſailors were terribly afflicted with the Scurvy; but he obſerved, that the Dutch ſhips then in company were much more free from this diſeaſe. He could impute this to nothing but their different food, which was ſtock-fiſh and grout; whereas ours was ſalt fiſh and oat-meal. He was then come laſt from the Mediterranean; and had, at Leghorn, taken in a great quantity of lemons and oranges. Recollecting, from what he had often heard, how effectual theſe fruits were in the cure of this diſtemper, he ordered a cheſt of each to be brought upon deck, and opened every day. The men, beſides eating what they would, mixed the juice in their beer. It was alſo their conſtant diverſion to pelt one another with the rinds, ſo that the deck was always ſtrewed and wet with the fragrant liquor. The happy effect was, that he brought his ſailors home in good health." Mead on the Scurvy.

do not eat too greedily, as of greens and fruit in general, ſo likewiſe of oranges and lemons, leſt their ſtomachs ſhould be diſordered by too ſudden an accumulation of different and conflicting fluids; and they ſhould throw themſelves into a Dyſentery, to which, otherwiſe, they are very liable; though an evacuation ſomething freer than uſual, may prove rather beneficial, from its promoting the diſcharge of the acrid matter.

Though oranges are unanimouſly preferred to lemons, yet the combined uſe of both, at the ſame time, is ſuppoſed more efficacious than either ſeparately.

LXXVI. As theſe fruits ſoon vitiate, ſo as to become unfit for uſe, unleſs carefully preſerved, and are not to be had in ſufficient plenty, at all times and places, the following method is uſed in England (1), for keeping their juice ſeveral years ſucceſſively, and for ſtill retaining all its ſavour, and its medical qualities.

Lemon juice, indeed, is extremely difficult to preſerve; but as to orange juice only, let the fruits be all ſound, ſince a ſingle

(1) Lind, part ii. chap. iv. p. 207—211.

rotten

rotten one would corrupt the whole quantity of juice: after letting it reſt ſome time, pour it clean off, or rather filtre it; then evaporate it gently in a *balneum Mariæ*, until it be gradually reduced to the conſiſtence of a ſyrup, adding to it ſome freſh rinds: when cold, cork it up in a bottle; and afterwards pour a little of the beſt Florence oil over the top of the juice; to which the acceſs of the air muſt be ſtill farther prevented, by a covering of wax or reſin over the cork. Two dozen of good oranges, weighing five pounds four ounces, will yield one pound nine ounces and a half of depurated juice; which, when evaporated, will be reduced to about five ounces of the *rob*, or extract; and this, in bulk, will be equal to leſs than three ounces of water; ſo that thus the acid and virtues of twelve dozen of lemons or oranges may be contained in a quart-bottle, and preſerved for ſeveral years.

LXXVII. As a third and laſt article, I had propoſed to offer ſome things for ſupporting what little natural ſtrength might be left, and for invigorating the

ſpirits

ſpirits of the men under pain and langour; to which end the diſcharge or correction of the morbid matter, (LXV. LXX. LXXI. LXXVI.) unqueſtionably do co-operate; from whence we may conſider this important particular, as in a great meaſure already fully diſcuſſed; the corroborants, which almoſt ſingly agree to remove or reſiſt all the three diſeaſes, having been, together with their virtues and uſes, particulariſed under theſe heads; whence nothing ſeems wanting, but to add a few words with reſpect to their diet.

LXXVIII. To this end ſuch ſolid and liquid aliment muſt be ſerved them, and in ſuch an allowance, as neither in quality nor quantity to exceed the ſtrength of the digeſtive faculty; and ſuch as alſo militate againſt the cauſes of thoſe diſtempers, nothing being nutritive but what is properly digeſted; ſince it otherwiſe becomes rather noxious to ourſelves, and nutritive only of diſtempers; according to that Aphoriſm of Hippocrates, which affirms, that the more impure and diſtempered bodies are nouriſhed, the more they

they are hurt; an aphoriſm directly applicable to our preſent purpoſe (1).

LXXIX. In putrid Fevers, at the beginning, all light broths and ſpoon-meat prepared with ſweet water, are moſt proper, with the addition of barley, rice or ſea-biſcuit boiled in them; and ſuch are rendered ſtill more wholeſome and palatable, by a proper commixture of acids, and of ſugar or melaſſes. Beſides theſe, ſhould the ſhip be in harbour, where ſuch things can be had, butter-milk and vinegar-whey will be found a very ſalutary variety. Theſe few ſuffice, in the firſt ſtage of the diſeaſe; and, did not reaſon and experience, on all ſides, confirm the benefit of this, the great averſion of the patients to all other foods, eſpecially fleſh, &c. and their fondneſs for theſe, or the like liquors, would naturally lead us to the adminiſtration of them.

Afterwards, when the body is moderately cleanſed, the firſt aliments given are, boiled pulſe and greens, and ripe fruits where they are to be had: Barley or rice, ſweetened agreeably with ſugar

(1) Hippocrates, ſect. ii. aph. x.

or

or melaſſes; and, if the weakneſs of the patient requires it, ſome wine, meat-broth, with acids; then, laſt of all, freſh meat, till a ſufficient recruit of ſtrength and alacrity enſue.

LXXX. In malignant Fevers the ſick have little or no appetite to any food, ſo that ſimple panada is all that ſeems neceſſary: when the Fever, however, has continued ſome time, the pulſe being not over-quick, the tongue moiſt, with a ſlow ſpeech, and very little or no thirſt, ſome wine ſhould be added to the panada, and wine-whey may be uſed for drink: in ſuch circumſtances wine is highly commended by ſeveral perſons, of diſtinguiſhed character in phyſic, as a moſt excellent corroborant.

Dr. Pringle ventures even farther, and ſays, that he has obſerved, when the pulſe in theſe Fevers was ſunk, and at the ſame time very frequent, that in proportion as it roſe with wine, it became more ſlow and diſtinct; adding, he has experienced the good effects of wine, even when the tongue has been both foul and dry (1).

(1) Pringle, part iii. chap. vii. He adds, "The ſureſt indication for wine is taken from the long conti-

The

The like virtue has alſo been experienced in ſpirituous liquors, eſpecially when properly diluted with water.

The relief evidently communicated to the ſick by wine, is a certain indication, that we are to proceed in the moderate uſe of it: nevertheleſs, ſhould the Fever be attended with a delirium; or if the patient, after drinking it, becomes delirious, his ſpeech quick, and his looks wild, attended with ſudden jerks or twitches, this liquor, with other hot and cordial medicines, is to be abſtained from. Indeed, its goods effects may be often predicted, as it were, from the great fondneſs of the patients for it; ſome of whom will think they are never ſufficiently indulged with panada, if wine is mixed with it.

This remarkable appetency of wine and ſtrong liquor in convaleſcents, from

nuance of the diſeaſe, the languor, dejection, the ſlowneſs and faintneſs of the voice. I have ſeen, in caſes of this kind, ſtrange inſtances of the power of inſtinct; for when wine was to do good, the ſick ſwallowed it greedily, and aſked for more: when it was to heat them, or raiſe the delirium, they either ſhewed an indifference, or an averſion to it.

putrid Fevers, the Dyſentery, or malignant Fevers, their ſtrength at the ſame time being at a very low ebb, is often extremely violent. In regard to the perſon I have already mentioned (XLVIII. n. 3.) I am conſcious, that though remarkably moderate in regard to wine, and even deteſting ſpirituous liquors when in health, yet he was inſatiably fond of the wine called St. Lawrence, and of Geneva(1). The general allowance of wine for patients, is half a pint each day.

LXXXI. From a multitude of obſervations, concerning the food proper in a Sea-ſcurvy, an alteration of diet is judged indiſpenſibly neceſſary; ſuch as freſh meat, broth, freſh bread, and freſh or pickled greens, for eatables; the liquors,

(1) As a perſon under extreme hunger and thirſt could not poſſibly forbear eating and drinking meats and liquors ſet before him, as little ſhould I have been able to have kept myſelf from the moſt ſhameful ebriety, had not that exceſſive fondneſs for ſpirituous liquors gone off with my diſtemper: for as long as that continued, it was found neceſſary to gratify this eager propenſity, in ſome meaſure; and, that the pleaſure might continue the longer, I myſelf directed theſe liquors to be inſtilled, as it were, into my mouth, *per deliquium*, or drop by drop.

milk,

milk, whey, butter-milk, ſlummery mingled with honey, wine or ſugar, cyder, negus, acid rum-punch, and ſangree, *i. e.* water and wine acidulated and moderately ſweetened.

Mr. Biſſet (1), contrary to Dr. Lind (2), affirms, that brandy, rum, and other ſpirituous liquors, if uſed according to the manner introduced into the Engliſh navy by Admiral Vernon, when in the Weſt-Indies, that is, diluted with three times the quantity of water, are of good effect in the Scurvy; being both powerful antiſeptics and corroboratives; adding, however, that the addition of ſugar and lemon juice is a vaſt improvement of that beverage.

The latter writer (2), with due deference to his judgment, ſeems to lay too great a ſtreſs upon rice, which he conſiders as a ſpecific againſt the Scurvy; for it is in the return home that this diſtemper chiefly rages; notwithſtanding the men have then a plentiful allowance of it. May not the happy recovery of ſuch

(1) Biſſet, p. 47.
(2) Lind, part ii. chap. i. p. 118.

numbers from the Scurvy among the Engliſh in Cumberland-bay, be attributed to the rich Malaga wine, of which each man had half a pint a day; and to the ſugar put into the rice, rather than to the rice alone? Had the decoction of guaiacum, the ſweet water, and the elixir of vitriol, no ſhare in this fortunate event? And, muſt we not, in a conſiderable degree, aſcribe this happy recovery of ſo many ſcorbutics to their being on ſhore, where they could rove about at pleaſure?

LXXXII. How the noxious cauſes, which have either produced or promoted the ſaid diſtempers, are to be removed or corrected, may, in many reſpects, be eaſily collected, partly from a knowledge and examination of the cauſes themſelves; partly from what has already been ſaid concerning the neceſſary diet; as well as from the ſubſequent rules I ſhall lay down in the ſequel, relating to preſervatives from ſuch diſeaſes; ſo that all to be ſubjoined here, on this head, is:

That the purifying of the air, the method of which I ſhall hereafter indicate, and cleanlineſs, are of ſuch eſſential importance

portance in Fevers and Dyſenteries, that, without due attention to theſe points, a recovery is ſcarcely to be expected.

That with reſpect to malignant Fevers, of a ſlow progreſs, the change of air alone, has been frequently known to check, and even ſtop them effectually.

That ſcorbutics, in general, manifeſt a paſſionate longing for a land air; and that they are even not a little relieved, immediately on being brought on ſhore.

That thoſe who are under an intermitting Fever, attended with an extreme proſtration of ſtrength, muſt be continually kept in bed, and not be permitted even to ſit up in it.

That ſuch ſcorbutics as labour under the higheſt ſymptoms of it, muſt, however vegete and chearful they may appear, be ſerved with a glaſs of wine, and ſome orange or lemon juice in it, before they are carried on ſhore.

LXXXIII. All that now remains concerning the Cure of the uſual ſea-diſtempers, is briefly to ſhew, by what methods ſome of their principal ſymptoms, with ſuch exacerbations as often accompany

them, may be either mitigated, or entirely ſubdued.

The Dyſentery, as a moſt dangerous ſymptom, and generally combined with, or ſubſequent to, a common putrid Fever, when violent, demands our particular attention and aſſiduity. Terrible as the appearance of this ſymptom is, our art is not deſtitute of ſuch remedies, and ſuch a regimen, as are pretty generally ſuperior to its malignity and violence.

In the firſt appearance of this ſymptom, before a ſtate of extreme debility enſues from it, one or two drachms of ipecacuanha root may ſafely, and even with advantage, be adminiſtered, by way of infuſion, in ſome white wine, or in ſubſtance, in different forms; which exhibition of it in ſubſtance may be ſo conducted, that, according to Geoffrey (1), ten, or even ſix grains of it ſhall have an equal effect to one or even two ſcruples. After the puking occaſioned by it, let the patient drink eight ounces, or half a pint of water, either alone, or with a mixture of honey; when this is caſt up, a like quantity, repeating

(1) Geoffrey, Mat. Med. tom. ii. pag. 94.

peating it after every vomition, till it is retained, and then generally the Flux ceaſes. An hour afterwards give him, by way of cordial, a toaſt rubbed with nutmeg, and wine mulled with ſugar and ſpices; at night an opiate, wherein there cannot be a better ingredient, than a grain or a grain and a half of that drug from which the medicine derives its appellation of an opiate. This proceſs is repeated the enſuing day, and likewiſe the third and fourth, according to the exigence of the caſe. In the mean time, the patient is to drink plentifully of milk and barley-water mixed, or barley-water with wine and cinnamon, or ſuch other liquids anſwering the ſame intention.

By proceeding in this manner, moſt Dyſenteries will be brought to a happy period.

But as all bodies cannot conveniently bear the ſtrong and repeated operations of emetics; in theſe caſes recourſe muſt be had to rhubarb, either ſimply in ſubſtance, or combined with lixivial ſalt, as Degnerus recommends; uſing, as to the reſt, thoſe cordials and anodynes which

I have ſpecified in the preceding caſe. This method will alſo be found equally effectual with the former.

The peccant matter being now diſcharged by theſe remedies, notwithſtanding the Dyſentery ſtill continues, from the weakneſs of the viſcera, the *ſimaruba* may be called in, as its ſingular virtue in ſuppreſſing the Dyſentery is unqueſtionable. With it may be united other aſtringents and emollients, which, whatever way they are adminiſtered, whether as clyſters, or by draughts, are alſo of manifeſt and approved efficacy in this caſe: ſuch as caſcarilla, pomegranate ſhells, oak bark, Magellan's cinnamon, commonly called winter's bark, contrayerva, ſalep, tormentilla, izinglaſs, *pulvis diatragacanthus frigidus*, or refrigerative powder of gum-dragon, theriaca Andromachi, diaſcordium Fracaſtorii, and Sylvius's conſerve of red roſes, &c. all which are to be differently combined and varied, according to the different circumſtances of the diſeaſe and the patient; and, on this head, Degnerus gives us ſome very ample and very judicious directions.

LXXXIV.

LXXXIV. A ſimple Flux may be ſuppoſed by ſome to merit a particular diſcuſſion; but as this ſymptom is ſeldom dangerous, and muſt rather be conſidered as a fortunate outlet, which nature herſelf has elected for the diſcharge of the morbific humours, I cannot think that any very particular method of Cure is neceſſarily indicated here: Practitioners, who are of a different opinion, may ſatisfy themſelves, by ſelecting from the various remedies ſpecified in the foregoing ſheets, and which are known to be ſo very beneficial in a Dyſentery, ſuch as they may judge more peculiar, and appropriate to one from ſuch cauſes.

LXXXV. The Chocolate or Coffee-ſickneſs, or the Black-ſickneſs, as it is called by Hippocrates (for I conſider theſe different appellations as having the ſame ſignification and import) is a ſymptom from a higher degree of putrefaction. This appellation, at the ſame time, is not taken from the blackiſh hue, or ſhade of the ſkin, but is derived from the fetid blackiſh matter diſcharged thro' the firſt paſſages, which may be conjectured to be either corrupted

corrupted bile, or poſſibly extravaſated blood; and hence we probably ought to deduce the origin of thoſe black blotches on the ſurface, which diſtinguiſh this deforming and dreadful malady.

In abating or removing this diſtemper, acids ſhould certainly take the lead of all other medicines; theſe intitled to our next choice, are ſuch as promote the diſcharge of the putreſcent humours, as caſſia, tamarinds, &c.; and theſe, again, are to be ſucceeded by corroboratives and cordials; ſince the natural ſtrength is, in this caſe, reduced to the loweſt ebb. The particular remedies correſponding to theſe ſeveral indications, have been ſufficiently ſpecified in the preceding pages.

The benefits accruing from this conduct in the *morbus niger*, or black Fever, are confirmed, with variety of obſervations, by M. Varnier (1), a French phyſician, who recommends it from experience, in the ſtrongeſt manner.

LXXXVI. The delirium, whether conſidered as a ſymptom of the putrid Fever,

(1) Recueil de Medicine, Chirurgie, &c. Fevr. 1757. p. 83.

or

or as a conſequence of the ſtimulating acrimony of corrupt matter, accumulated in the *primæ viæ*; or, as occaſioned by an obſtruction of inſenſible perſpiration, is relieved by the ſame medicines, which are generally efficacious in other Fevers.

In a faint pulſe, the application of leeches to the temples is held more adviſeable than opening a vein.

Of epiſpaſtics, or bliſters, I ſhall only ſay, that they are too often uſed unſeaſonably and prematurely; particularly in the firſt ſtage of a diſeaſe, and when the rapid ferment of the blood ſeems conſiderably to interdict all ſtimulation; but afterwards, and ſubſequent to proper evacuations, they have ſometimes been recurred to with remarkable good effects.

They are then applied to the head by way of preventing a retention of urine; but, according to the judgment of Dr. Whytt, not until twelve or fourteen hours after ſhaving the head cloſe.

LXXXVII. Should a putrid Fever, in the beginning, be attended with convulſions, there is no need of having recourſe to any particular anticonvulſive medicines; ſince,

ſince, upon opening the *primæ viæ*, the great alimentary canal, they very generally diſappear.

LXXXVIII. The ſymptom, termed in Latin, *meteoriſmus*, is an inflation of the belly, accompanied with rumbling noiſes, occaſioned by extravaſated, putrid matter in the firſt paſſages.

This ſymptom is frequently ſeen in putrid Fevers, eſpecially when the corrupted humour, or matter, for want of a ſufficient attenuation, by a due proportion of drink, has not been ejected within a convenient time, to prevent its conſiderable accumulation; which may, undoubtedly, prove very dangerous, by its compreſſing the midriff, and thence becoming a painful impediment to reſpiration, not to mention other detrimental conſequences.

Dr. Tiſſot(1) affirms, that, in this caſe, he has ſeen very good effects from applying clouts dipped in cold water on the belly, and renewing them every quarter of an hour; the patient, at the ſame time, drinking three ounces of cold water, as often as the moiſt clouts are renewed.

(1) Tiſſot, p. 116, 117.

LXXXIX.

LXXXIX. In a ſcorbutic rottenneſs of the gums, or ulcers in the mouth, a gargle of the bark, or of tincture of myrrh, acidulated with lemon juice, and ſweetened with honey, or melaſſes, is uſually called in as a topical auxiliary.

XC. In an exceſſive ſalivation, whether ſpontaneous, or occaſioned by an injudicious uſe of mercury, epiſpaſtics, are applied to ſeveral parts of the body, and ſinapiſms to the feet. Alſo clyſters or gentle laxatives are to be adminiſtered; but eſpecially diaphoretics of theriaca, camphor, and flower of brimſtone, for ſpeedily diverting the ſaliva from the ſalivary glands; and, at the ſame time, aſtringent and mucilaginous gargles; a due regard being always to be had to the ſupport of the *vis vitæ*.

XCI. In dangerous hæmorrhages from the noſtrils, gums, &c. alum, juice of acacia, elixir of vitriol, and the bark, are adminiſtered inwardly, with good conſequences.

XCII. In vertigos, or deliquiums, the beſt cordial is a glaſs of generous wine, with orange or lemon juice.

Mr.

Mr. Reynolds (1), an Engliſh ſurgeon, for preventing the ſcorbutic men from fainting, when they are moved, recommends a girth round the belly, as to patients after the *paracenteſis*, or tapping, in a dropſy.

XCIII. In obſtinate wakefulneſs, and difficulty of breathing, few things have been found more beneficial than camphor; eſpecially when the patients complain of pain, and particularly in the ſide, in which caſe, a little oxymel of ſquills muſt be added to it. At the ſame time a fomentation of equal parts of brandy, beer, and vinegar, with camphor and Caſtile ſoap, is accounted a moſt excellent external anodyne.

XCIV. Some other methods, very much approved, are, when the ſkin is disfigured with blotches, to rub the legs, &c. three or four times a day with freſh limes, lemons, or oranges: In an œdematous ſwelling of the legs, firſt to pour cold ſea-water on them; then having rubbed them with the ſaid fruits, to apply a diſcuſſing poultice, or plaiſter; and in a hard

(1) Gentl. Mag. for Jan. 1758.

ſwelling

ſwelling of the calf of the leg, attended with pain, a ſtiffneſs, and induration in the knees, a contraction of the flexors, muſcles, or tendons, and a tenſion of the fibres, to foment them with the pulp of China oranges, or to fumigate them with the ſteam of hot water and a little vinegar, is alſo highly commended.

XCV. Laſtly, we muſt obſerve, that ſevere and frequent returns of fainting, difficulty of breathing, colliquations, the jaundice, indurations in the inteſtines, the dropſy, mortifications, and ſtiffneſs, with an immobility, and *anchyloſis* of the limbs and joints, are ſeldom thoroughly cured; and, in the Scurvy, are generally fatal.

CHAP. VIII.

Of Preſervatives.

XCVI. I Now come to the ſecond clauſe of the laſt part of the Society's Queſtion, which relates to Preſervatives from the uſual ſhip-diſeaſes.

Intereſting and important as the ſubject is, I may, however, be allowed to diſcuſs it with the greater brevity, as the knowledge

knowledge of the cauſes which produce theſe diſtempers, points out to us, in a conſiderable meaſure, what is to be done, and what is to be avoided; and the very ſame methods and medicines which I have recommended for the cure of theſe diſeaſes, are alſo applicable as Preſervatives from them. I may, therefore, the more readily hope to be excuſed, if I mention only ſome particulars relating to this head, and confine myſelf to the moſt important rules directed for attaining this capital purpoſe. Now, as I ſhall adapt theſe regulations to the circumſtances of a common foremaſt-man, I ſhall obſerve, that all the Preſervatives are to be very ſimple, of a moderate or even low price, and yet efficacious; eaſily carried to ſea; diſpoſed to keep ſound; and, laſtly, to ſerve both in Fevers, and in the Scurvy.

XCVII. It muſt be previouſly remarked, that Preſervatives may be conſidered in a two-fold light; firſt, to ſecure the health of the men againſt any attacks of thoſe diſeaſes; and, ſecondly, to preſerve convaleſcents, or thoſe who are lately recovered, from relapſes.

The

The means for accompliſhing both theſe ends are ſo ſimilar, and ſo connected, that what is ſerviceable in one, alſo conduces to the other: Inſomuch that the whole may be comprized in two documents, or directions.

The firſt is, to keep at a diſtance, to remove, or to correct the external cauſes, to which ſhip-diſeaſes are uſually owing.

The ſecond, that the bodies of the ſeamen be kept in ſuch a temperature and ſtate, as not to be ſuſceptible of thoſe diſeaſes; that is, either totally to preclude from the body, or to extirpate in due time, the inward prediſpoſing cauſes.

What I had juſt premiſed above, comes alſo under notice here, viz. that the means which anſwer the latter object, likewiſe conduce to the former, and *vice verſa*.

XCVIII. To attain the firſt end, the following intentions ſhould be purſued with the ſtricteſt aſſiduity.

1. We muſt effect the utmoſt poſſible purification of the air, and a preſervation of it in that pure ſtate.

That both are neceſſary, as well for preventing diſeaſes and contagions, as for

promoting a ſpeedy recovery, and ſubſequent indemnity from them, during the remaining term of the voyage, is too evident, from what has been ſaid, to ſtand in need of any arguments; and, though Dr. Lind (1) avers, that he never knew the Scurvy to be produced from foul and putrid air only; and, that ſhips, in which Mr. Sutton's engine was uſed, have been invaded by it; and alſo adds, it has been cured amidſt ſuch a vitiated air; yet he candidly acknowledges, that the impurity of the air greatly contributes to heighten the malignity of that diſtemper; and that it may reaſonably be conſidered as a collateral, or concurrent cauſe. There are two ways of purifying the air in a ſhip: Either by depriving that already in the ſhip of its noxious qualities, as moiſture, heat, &c. which is effected by nothing more effectually, than the uſual fumigation, by burning tar, or pitch, twice a day in a pot, and ſhifting it to different parts of the ſhip. Or (2), by continually

(1) Lind, part ii. chap. i. p. 99, 100.
(2) Idem, ibid. chap. iv. p. 232.

intro-

introducing freſh air throughout the ſeveral parts of the ſhip.

To effect this important, and moſt ſalutary purpoſe, many machines have been invented; but, as far as I am a judge, that of Mr. (*) Sutton, an Engliſhman, beſides the ſimplicity of its conſtruction, anſwers the beſt of any which have hitherto appeared.

It conſiſts of copper-pipes, or conduits, which are extended from all parts of the ſhip, where the air is to be kept purified, to the galley, or cook-room; by the means or medium of which pipes, a communication is preſerved between thoſe parts and the fire-place.

The manner of its action, and the advantages obtained thereby, are at preſent very readily conceivable: For the air of the galley being heated by the fire, and conſequently rarefied, the denſer air in the

(*) Our author, at the time of writing this, had probably received no information of the much better conſequences of the late Dr. Hales's ventilators, which are very juſtly preferred by thoſe, who have ſeen the effects of both on board of ſhips. See alſo medical Obſervations and Inquiries, Vol. ii. p. 7. N. *.

ſeveral parts of the ſhip, flows with a continual current through the pipes to the galley, where it is diſcharged; being as inceſſantly replaced by a freſh ſtream of ſucceeding air from without, whence a continual circulation of the pure ineffæte element is preſerved.

The utility of this method is evinced by ſo many inſtances among the inventor's countrymen, and the ſimplicity ſo eaſily underſtood, that I have long been ſurprized, it has not been adopted in our marine: and the rather, as the wind-ſails uſed on board our ſhips, beſides their anſwering this end but very imperfectly, are attended with many inconveniences, as Mr. Watſon (1), an Engliſh phyſiologiſt has clearly demonſtrated.

This method of renewing the air has been adopted in Sweden, with the following improvement, which the Royal Academy of that nation have thought fit to add, by way of obviating any danger from the fire, however inconſiderable, and eaſily guarded againſt. That no live coals

(1) Obſervations on Mr. Sutton's invention, &c. p. 58.

may

may fall into the open tubes, or conduits, they recommend, that, at the fire-place the pipes be cloſed, and the air in them being expanded by the heat, and having an outlet into the warm and highly rarefied air of the chimney, the benefits will be the ſame (1).

Other regulations, very juſtly thought to conduce to purifying the air, and to preventing any infection, are, That the ſhip be always kept clean and lightſome between decks; in rainy or ſtormy weather, as dry as poſſible; and that, in fair weather, the ports be opened: That the ſhip's crew be obliged to keep their cloaths and their perſons clean; thoſe who are actually ſeized with the putrid Fever, or Dyſentery, ſhould be ſeparated from the healthy; and, upon coming into a harbour, or arriving on a coaſt, they ſhould, as ſoon as poſſible, be conveyed on ſhore; they are, every time, to be moſt carefully waſhed and cleanſed; the fæces of ſuch Dyſenterics, as are confined to their bed, muſt be thrown away immediately; and,

(1) Commentar. de rebus in ſcientia natur. et medic. geſtis, tom. vii. §. iv. P. iv. 587.

any foul linen tainted with their ordure ſhould be well waſhed, whether from their bodies, or their bedding: The dead ſhould be kept on board no longer than neceſſary, and their cloaths and bedding ſhould be alſo thrown overboard.

Another particular of the greateſt importance, for ſecuring the health of the ſeamen, againſt the ill conſequences of the heat and moiſture, and the cold of the nights in the Torrid Zone, is, on the one hand, as far as it may conſiſt with the neceſſary ſervice, to ſuſpend all labour and hard work, during the hotter part of the day; and, on the other, not to ſuffer the men to loiter upon deck in the night, eſpecially in the more cool, and damp, early hours towards the morning; or to doze againſt the ſhip's ſide in the open air. Care ſhould alſo be taken, that the beds in dry weather be aired, at leaſt, once a week, and the hammocks ſhould always be covered with a tarpaulin; that the men, on coming off duty, lay aſide their cloaths, if wet, and, by no means ſleep in them: and, that every man, on his coming on board, if in want, be provided

vided with a ſufficient ſtock of cloaths to keep himſelf clean and dry; and, particularly, that he be not unprovided of a watch-coat.

It might alſo be of great advantage, in point of health, if every ſhip were furniſhed, at the publick expence, even with ſome ſupernumerary watch-coats to ſhift the men, during their nightly duty, or in a continuance of very wet and ſtormy weather.

As to infectious bodies, which ſometimes float in the very air, and againſt which no natural vigour is a ſufficient defence (whatever ſome of the antients, and many chemiſts, may pretend) no medical Preſervatives have hitherto been diſcovered, the nature and form of the poiſon remaining ſtill a myſtery to us. Wherefore, the only reſource, or means, within our power in this reſpect, is, carefully to refreſh and purify the air, according to the preceding directions.

2. Such meats and drinks ſhould be uſed, and in ſuch a manner, as are particularly wholeſome, comfortable, and beneficial to ſeamen.

To this end, with regard to the quantity, moderation is to be regarded; exceſs having often proved one of the principal cauſes of their maladies; wherefore, in my opinion, it is adviſeable, that the allowance of aliments ſhould be determined according to the various junctures; it is better to eat often, than to overload or ſurcharge the ſtomach at once.

With reſpect to the quality of their ſolid and liquid food, I would recommend this general rule---That it be of an antiſeptic nature, putrefaction being the proximate cauſe of the principal diſtempers at ſea: Hence, all vitiated foods and drinks muſt be extremely pernicious.

Farther, concerning their quality, it may generally be ſufficient to obſerve the propenſity of nature herſelf on this head; experience having ſhewn thoſe foods to be the moſt effectual Preſervatives againſt putrid diſtempers, which the men, by a natural ſuggeſtion, are ſo paſſionately fond of.

It has generally been thought ſtrange, that the inhabitants of hot countries ſhould ſeaſon their food much higher, and be

be fonder of ſpices, than thoſe of temperate climates. But, is it not evident, on a farther reflection, that the moderate uſe of theſe generous productions, conſidering the relaxed ſtate of the veſſels, and the tendency of the humours to putrefaction, may be abſolutely neceſſary? In what other climates, in fact, does nature produce the hot and aromatic plants, and fruits, in ſuch variety and abundance?

This we ought certainly to contemplate, as a ſignal mark of the benign and bountiful care of Heaven for mankind; according to the medical axiom, *Ubi morbus, ibi remedium:* From ſuch a paſſionate appetite and fondneſs it is, that the men, as ſoon as brought on ſhore, long ſo very much for greens, ſoft bread, broth, and meat. This all captains and maſters of ſhips ſhould therefore conſider, as a certain and ſtrong indication of what is neceſſary for the preſervation of the ſeamen; and thus, from time to time, avail themſelves of every convenient opportunity, to procure them ſuch refreſhments (1).

(1) Our appetites, if not depraved, are, upon this and many other occaſions, the moſt faithful monitors,

Concerning

Concerning the ſhip's allowance, in particular, the following rules are indiſpenſibly to be obſerved.

The peaſe and oatmeal, in long voyages, ſhould be dried in the oven; a convenience, which few large merchant-ſhips, and ſhips of war, at preſent are unprovided of; and if, after this precaution, any mites, maggots, weavils, &c. appear in theſe leguminous aliments, they are to be carefully ſifted and cleaned.

and point out the quality of ſuch food, as is ſuited to our digeſtive organs, and to the ſtate and condition of the body. For where there is a diſpoſition to the ſcorbutic laxity and putreſcence, from a long continuance in the moiſt ſea air (concurring with the viſcous, glutinous, and too ſolid diet uſed there) nature points out the remedy. In ſuch a ſituation, the ignorant ſailor, and the learned phyſician, will equally long, with the moſt craving anxiety, for green vegetables, and the freſh fruits of the earth; from whoſe healing, attenuating, and ſaponaceous virtues, relief only can be had. All ſuch people, in the height of this malady, not only employ their thoughts all day long, on ſatisfying this importunate demand of nature; but are apt to have their deluded fancies tantalized in ſleep, with the agreeable ideas of feaſting upon them at land. What nature, from an inward feeling, makes them thus ſtrongly deſire, conſtant experience confirms to be the moſt certain prevention, and the beſt cure, of their diſeaſe.

When

When the ſhip's bread is any ways mouldy, let it alſo feel the oven, or be laid in the galley, till it be thoroughly dried.

No putrid, tainted fleſh, nor ruſty bacon, ſhould be ſerved to the people, or, if unavoidable in long voyages, it ſhould be iſſued in a ſmaller quantity; and at the ſame time to prevent, as much as poſſible, its pernicious effects, ſuch meat is to be ſteeped in water, or frequently waſhed, and a portion of vinegar ſhould be given with it; or, which is ſtill better, freſh orange, or lime juice, whenever it is procurable, which it generally is in moſt parts of the Weſt-Indies.

The Engliſh writers mention, with great commendation, pickled cabbage, pickled French beans, &c. as ſome *ſuccedaneum*, or ſubſtitute, in the want of freſh greens at ſea; but acknowledge, that the ſame vegetables, when dry, were void of any ſalubrious, or even nutritive quality.

Dr. Lind (1) accounts an addition of muſtard-ſeed, onion, or leeks, to the ſhip's proviſion, to be ſo very efficacious againſt

(1) Lind, part ii. chap. iv. p. 233.

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the Scurvy, that he declares, he never ſaw any one affected with it, who made uſe of that method; and he earneſtly wiſhes, that ſhips were allowed a plentiful ſtore of thoſe moſt wholeſome and antiſcorbutic vegetables (1).

Mr. Biſſet recommends water-gruel, of the conſiſtence of cream, and ſweetened with melaſſes, as imparting to it an aperient and deterſive quality; and that pulverized pepper be always mixed with the boiled peaſe, in the proportion of (*) half an ounce, to a hundred men, whereby this meal will be greatly improved, which otherwiſe would be apt to generate ſlime in the firſt paſſages, and conſequently flatulencies and indigeſtion, with a morbid lentor, or viſcidity, of the maſs of blood.

Sometimes the ſhip's company, on board the men of war of this ſtate, are

(1) Biſſet, p. 87, ſeconds him, and recommends that a competency of made muſtard be ſerved to each meſs, on beef and pork days; or onions, or pickled cabbages.

(*) The Dutch original ſays, two ounces and a half. This would give each man between twelve and thirteen grains of pepper, being five times that quantity, which the tranſlator ſeems to have preferred.

ſerved

ſerved biſcuit boiled in beer, with melaſſes, ſome pounded ginger being afterwards added to it; and I cannot help thinking that it would not be amiſs, were it made an eſtabliſhed allowance twice a week, in lieu of peaſe or oatmeal; two or three pounds of melaſſes would ſerve a hundred men; ſo that the meſs would not be very expenſive.

With reſpect to their drink, I ſhall premiſe ſome particulars, not inſignificant, I hope, relating to the water; and then offer ſome directions, with regard to ſuch liquors as may be moſt proper and wholeſome for ſeamen.

To purify foul and bad water, taken out of ponds, and full of heterogeneous particles, ſo as to render it fit for uſe, the moſt ſimple and eaſy method is the following, which was tried with good ſucceſs in Hungary, to the great relief of the Auſtrian army.

A long ſmall boat is divided into ſeveral different apartments, by croſs partitions. They fill them all, except the laſt, with ſand. The boat is put into the lake. A hole, level with the ſurface of the water, is made in the end of the boat,

which

which lets the water into the firſt diviſion; from this it gets into the ſecond, by a hole made in the bottom of the firſt partition; from the ſecond it runs into the third, through a hole in the top of the ſecond partition; and ſo alternately above and below, that it may be obliged to paſs through all the ſand. At the top of the laſt diviſion there is a pipe through which the water comes, at pleaſure, as pure as from a fine ſpring. By the ſame contrivance ſeamen, when meeting abroad with ſuch foul, or unhealthy water, may purify even the hardeſt kind of it: And, for the ſame purpoſe, in a houſe, he propoſes ſome caſks divided in the middle, and filled with ſand; into the firſt of theſe diviſions, the water may be thrown as into a ciſtern; the caſks ought, for this purpoſe, to be joined by pipes; and by making the water thus circulate through eight or ten diviſions filled with ſand to the top; a pure artificial ſpring may be had any where (1).

(1) Such are not uncommon in France, but of a more elegant conſtruction, and with improvements, called *Fontaines domeſtiques*. See *Journal Oeconomique*.

Mr.

Mr. William Chapman, maſter of an Engliſh merchant-ſhip, being diſtreſſed for want of water, relieved his men by mixing ſome wood-aſhes with ſea-water, and thus diſtilling it. He ſays, and his narrative has all the appearance of truth and benevolence, that the water came off pure and tranſparent, was light, and lathered well; and, on his arrival at Shields, he invited ſeveral of his acquaintance on board to taſte the water, of which they drank ſeveral glaſſes, and thought it nothing inferior to ſpring-water. He adds, that he made them a bowl of punch of it, which was highly commended (1).

I have diſtilled ſea-water, as brought hither in water-boats, for the ſalt-boilers, and to me it appeared as pure and palatable as the beſt river water.

I am farther informed by a captain of one of the States ſhips, that a man of war of three hundred men, bound to the Weſt-Indies, generally takes in ſixty whole and ſixty half leggers, beſides twenty whole and twenty half aums, of water;

(1) Gentl. Mag. July 1759.

or,

or, according to a later eſtabliſhment of the Maeze Admiralty, ſeventy-five whole and eighty-eight half-leggers; thirty whole and twelve half aums, of which are daily expended twenty or twenty-four anchors. Now to obtain ſuch a quantity, I have found, by experience, that a common diſtilling kettle, with two ſacks of Sunderland coals, of which nineteen go to a *hoed* (*), is ſufficient.

Such a kettle, with its worm, vat, and fire-place, will require a ſpace of ten or eleven Rhynland feet, ſquare, with nine feet in height; and thirty *hoeds* of coals, which will laſt forty weeks, take up twelve hundred ſquare feet.

Therefore, if no other difficulties offer againſt an eſſay for introducing the general uſe of ſuch water in our navy, and merchant ſhipping, as a much leſs number of caſks would be required, I am inclined to think, that room might be found for the Still, and all its appurtenances, without any inconvenience.

(*) Some dry Dutch meaſure for coals, or other things.

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