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3.
RATIONAL ADVICE

TO THE

MILITARY,

WHEN EXPOSED TO THE

INCLEMENCY

OF

HOT CLIMATES AND SEASONS.

BY ANDREW WILSON, M. D.

Fellow of the Royal College of Physicians, Edinburgh,

AND

Consulting Physician to the Medical Asylum in Welbeck Street.

L O N D O N :

Printed and Sold by W. RICHARDSON, opposite Salisbury Street :

Sold also by J. STRAHAN, N^o 67, in the Strand,

M DCC LXXX.

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THE CLIMATE AND SEASONS.

BY ANDREW WILSON, M.D.

Professor of the Royal College of Physicians, Edinburgh.

AND

Containing Hints to the Medical Officer in Warlike Service.

LONDON:

Printed and Sold by W. Richardson, opposite Salisbury Street;
and also by J. GARRARD, No. 47, in the Strand.

M DCCC LXV.

THIS small essay is calculated for the use of all our countrymen constantly passing to the East and West Indies, and becoming residents there, as well as for the present circumstances of our armies.

But as at no period of our history, the merit, the importance, the valour, and the loyalty of our armies have ever been more distinguished than they are at present; this small tribute of the highest regard, is respectfully inscribed to the gentlemen of the army, by

THE AUTHOR.

Beaufort Buildings,
28th Dec. 1780.

E R R A T A.

Page 8, line 1, *for of read if*

12, Note, l. 3 from bottom, *dele colon after diversities*

14, l. 8, *read* is retarded, and less

19. *dele* the

18, l. 1, *read* bilious

21, l. 8, *after recurrent add a period*

l. 21, *read* observation of

29, l. penult. *dele comma after parts, and place it after especially*

31, l. 2, *read* wastes the

33, Note, l. penult. *for digestion read* dejection

34, l. 4, *read* activity

35, l. 8, *read* mill

INTRODUCTION.

THE real and extensive importance of this subject did not strike me when I first engaged in writing the following pages, as it does now. I meant no more than to compose a few such private directions as I thought might prove useful to any individuals of my acquaintance, who might be called to service in dangerous climates. When I considered the subject attentively, the importance of its end struck me more and more sensibly ; till at last I determined, if there was any reason and weight in my sentiments, to give
A them

them the best chance I had access to of their being rendered as generally useful to my country as possible.

In the brief detail I have thought necessary to introduce of the origin and genius of the diseases of hot climates, in order to account for the few rules which I thought most calculated to prevent them, I have been as plain and intelligible as possible, and therefore have said nothing of *infection*, *marsh miasmata*, &c.

I am well satisfied, whatever truth or reality there may be in these obscure subjects, that every disease of climate almost, that we are acquainted with, may be referred to more certain, obvious, and intelligible causes; while there are no certain and
rational

rational means known, nor can be prescribed for obviating and preventing the influence of unintelligible causes.

What added to the importance of my views, was the idea that struck me of the possibility of rendering all the rules necessary for preserving the Health of soldiers a part of the discipline and exercise, that they might easily be made obliged to observe by the intervention of their inferior and non-commissioned officers.

There is one thing that I do not remember to have observed inculcated at all; which, yet I am authorised by too frequent and unquestionable observation to affirm, is of more consequence to be attended to than

any one thing in the whole doctrine of fevers.

The most malignant and fatal symptom, circumstance (or I know not what to call it) of almost any fever, is its being late and too far advanced before it is discovered. I am fully persuaded that this has proved the death of more persons in fevers than any other malignity in them commonly known among us.

I have seen many die of fevers, but more recover out of them: indeed I have met with very few, if any, instances of persons recovering, who went about (not knowing what was the matter with themselves) till the eighth or tenth day; when the fever had half, or more than half, run its course; while the poor patient, by
struggling

struggling against sickness, and endeavouring to throw it off, was thereby rendering his recovery impossible.

This must more frequently be the case with soldiers, than any set of men, being obliged to do duty as long as they can stand upon their legs. With submission I do suspect, this has carried off more men in that line of life than any other inherent malignity or putridity in the nature of fevers: *for all fevers* (I can scarcely even except true inflammatory ones) *become putrid before they can become mortal:* nor is there, in my opinion, *any fever really putrid until it is incurable.*

I am very sensible of the difficulty there must be in finding a remedy for this evil in an army doing the
duties

duties of a campaign. I know there are some men who would take the advantage of any particular attention paid to their health; but I know also, that there are many generous manly spirits among even the common foldiers (whom it is a thousand pities to lose) who would disdain complaining as long as they thought themselves capable of standing to their duty.

In a sickly season it might be of consequence for surgeons and their assistants to examine the state of the mens healths, and what complaints were among them, every morning: by their skilfulness and discretion they might easily distinguish between real complaints and fictitious ones. The advantage would soon be found of

of an early attention to the first symptoms of epidemics among soldiers; as it would certainly be found more than half the cure to obviate the symptoms of diseases in their earliest periods, before they had sapped the powers of life in the constitution.

This I can say with confidence, that in seasons when fevers were epidemic and very fatal to many; I have seen numberless fevers, that I had the greatest reason to suspect would otherwise have been dangerous, if not fatal, prove very mild and benign, requiring neither blister nor any other such powerful, tho' at best precarious medicines, merely by paying a requisite attention to them in their very commencement and first stages,

Upon

Upon the whole of this maxim, which I think will not be controverted by any persons of judgment in the profession of Medicine, is admitted; *that, namely, many may be saved by prevention, for every one that is recovered by medicine, after a disease has rooted itself in the constitution*; then it must be an object of the greatest importance, to chalk out some system of regimen for preventing and obviating, as much as possible, those diseases that are known to be epidemic in armies, and prove so fatal to them, especially in dangerous climates, to which their constitutions are not seasoned.

RATIONAL ADVICE

TO THE

MILITARY.

IT is an act of great service to the community in general, as well as of much humanity to particular individuals, to be in any degree instrumental in preserving the lives and the health of soldiers, so often necessarily exposed to the baneful vicissitudes of seasons and inclemency of climates, in the cause of their country.

The diseases that prove most fatal to soldiers in hot climates and seasons, cannot be prevented unless the inductive causes of them are known.

B

In

In such obscure and intricate subjects as that of the origin and remote causes of diseases; effects and causes are too often confounded, inverted in their order and influence, and mistaken for each other.

Bile being a leading symptom in all the *endemics* and *epidemics* of hot countries and seasons, we are apt to stop short here, without making any further enquiry, why such climates and seasons should so uniformly and universally generate that malignant symptom? Perhaps if that could be discovered and ascertained, the whole series of diseases, that seem to have any connexion with a vitiated state of the bile, might in a great measure be obviated and prevented.

It

It is not the heat nor cold of a climate alone that renders it unhealthy and pernicious; though by the incautioufness and indiscretion of individuals in the mismanagement of themselves, accidental diseases may be generated either in hot or in cold regions. But the climates that prove unhealthy are such as are either hot and moist, or cold and moist, at the same time.

In hot countries and seasons, unhealthfulness depends either, 1. on the particular season; such as the wet season in most tropical countries: or, 2. it depends on the sudden abrupt changes of the air within the space of a few hours from hot to cold, and from cold to hot again, very common also in the above

countries: or, 3. it depends on the situation and soil of particular spots in countries, yielding unsalutary and pernicious quantities of moist exhalations, which weaken the elasticity of the air, perhaps in some measure alter its properties, and also mingle with it in its application to our bodies *: or, 4. it consists in two or more

* The plains by the sea coasts and margins of great rivers, in countries and islands approaching to or lying within the tropics, are generally the spots, which the benefit of trade has directed Europeans to pitch upon for their settlements: these of consequence become the theatre of campaigns, when war is carried thither. These extended plains, however apparently dry they may seem at some seasons, are always comparatively moist and unwholesome; not only by reason of the rain which does not drain off them, as in countries that are healthy and abound in diversities: of elevations; but the soil being generally light, sandy, spongy, and fat, the waters of the seas and rivers, with

more of these circumstances combined.—The first is the cause of what are called *epidemic* diseases: the third constitutes *endemics*, or diseases confined to particular regions or tracts of country.

The primary and direct effect of hot seasons upon persons not accustomed to them is, to open the pores of the skin, and to exhale encreased quantities of animal fluids by sweat,

with which they are almost level, are attracted under ground, thro' them, to a great extent; where, by the heat of the sun, they ferment with the soil before they are exhaled. This state of the air encreases the relaxation, that a constant profuse perspiration imperceptibly produces in habits not tempered to such regions. It is not merely the encrease of cold that renders the evenings so remarkably dangerous in these countries, but the encrease of exhalations that become more condensed by the cold, and stagnant in the lower atmosphere.

and

and perspiration: this of itself does no hurt, if people are careful not to cool themselves indiscreetly, especially when their stomachs are full, or when they go to sleep.

The first *remote* consequential effect of a continued uncommon degree of perspiration is retarded, less frequent alvine excretions. Every person of self observation must have remarked, that pretty urgent calls to that discharge are immediately suspended by any exercise or accident that puts them into a profuse sweat: the internal circulation, and the functions that depend thereon, are preserved steady and regular, by the due re-action of the skin, returning the the circulation, and as it were concentrating it inwardly again. When
this

this action of the skin is relaxed and its tone in a great measure lost, by long very profuse perspiration or sweat, the re-acting balance of the circulation is weakened in proportion, and of course the internal functions become more languid by the want of that repressure that ought to support their vigor.

When this excessive waste of our fluids by the skin is continued, or renewed day after day without remission, the circulation, and consequently that mucous secretion that lubricates and facilitates the progressive descent of the indigestible parts of our food, becomes habitually impaired and more sluggish; of consequence digestion becomes more weak and imperfect; and lastly, from the
major

major parts of these retarded venous fluids of the intestines passing thro' the liver, and there giving off the bilous secretion, in its way to the heart, the secretion of the bile becomes, 1. retarded; 2. it becomes accumulated in the liver; 3. it becomes vitiated or altered in its qualities by its retardation; 4. it is discharged or rather expelled irregularly and spasmodically, by the excessive efforts of the overcharged vessels to unload themselves; 5. the natural peristaltic motion of the stomach and intestines being weakened, the irritation of uncommon quantities of vitiated bile throws them into spasmodic, and often inverted action §.

§ Almost all the blood of the intestines and of the parts contained in the belly, in its return from them to the heart, passes through the liver, and there the bile is separated from, or rather

Hence we perceive a natural foundation is laid for generating one or other of these diseases of the bowels or liver (according to the particular biases of different constitutions, or other accidental circumstances) which are so prevalent in hot seasons and climates; such as, the dry belly ach,

rather concocted and digested out of, that returning blood. Hence it is that the liver and intestines affect each other immediately. If the liver is obstructed, the bile becomes vitiated and unfit for promoting digestion: and in some cases of its obstruction dropsies of the belly are produced. On the other hand, if the functions of the intestines are disordered, and the blood is returned from them too slowly, the liver is apt to become overcharged with blood or bile; for the generation of bile encreases in proportion to the slowness of the circulation in the liver.—When the liver is overcharged, and cannot freely pass the blood sent to it, it is very apt to regurgitate upon the intestines, especially the lowest ones, and there to produce piles, hemorrhoids, dysenteries, bloody fluxes, &c.

C

choleras

choleras, bilous vomitings, dyenteries, acidities in the first passages, obstructions of the liver, jaundice, &c.

2. The second remote consequential effect of continued uncommon degrees of perspiration is, that the re-acting tone of the skin, that is, the resisting elasticity of its vessels, becomes insensibly weaker, and more unable to exert such a re-action upon the cutaneous fluids, as is necessary to return them with wonted energy, and thereby to preserve the vigor of the internal circulation; insomuch that, if even the excessive heats were to abate, yet the skin, after being relaxed to a certain degree, could not recover its tone for some time.

The consequence of this is, the natural constitutional heat of the
body

body becomes impaired (for that always varies in proportion to the vigor of the circulation); the circulation becomes languid; and, in proportion as that decays, the blood requires a greater disposition to an internal fermentative, or, what is commonly called, a *putrid*, motion.

When the habit is reduced to this state, which it often is, without any positive sense or symptom of a formed disease, or any felt uneasiness, besides a want of wonted vigor, the first accidental exposure to cold or moisture, or the first fatigue, will produce a fever; or rather a chillness, coldness, and listlessness, with pain in the bones or joints, or in the head, and great thirst; while the remaining powers of the constitution raise a

fever, by their efforts to repel these symptoms.

Two things are observable in the genius of all such fevers: 1. They are never so high and so violent in their symptoms, as fevers bred in sound constitutions from accidental causes; or if they do seem high and violent in their attack, it is only a flash in their first onset; for these symptoms will not bear bleeding; and the fever soon subsides from the seeming ardency of its first symptoms: 2. The other thing remarkable in the nature of these fevers is, that they generally degenerate into remittents or intermittents of various irregular types.

All fevers in their commencement may be referred to a morbid state of
the

the skin; but an habitual diseased temperament of the skin may, with strict propriety, be considered as the pathognomonic character of intermittents of every kind. Nothing else can account for a fever being either regularly or irregularly recurrent, until that degree of relaxation, inaction, or torpidity in the cutaneous system of vessels, constituting the universal sensible viscous and periphery of our frame, that gives rise to an intermittent, is removed, and the skin's natural re-action and vigor is restored || (which is often done by sudden, unexpected,

|| This sentiment respecting the primary seat and cause of intermittents may be deemed new and peculiar; it is what I have long entertained, and am persuaded that the attention and observation others turned to the subject, may soon make me not singular in the opinion.

The

unexpected, trifling, and seemingly inadequate means). You may vomit and purge, give alteratives, and administer correctors of bile as long as you please, yet still the intermittent paroxysms will recur.

The intention of this detail is not to introduce and point out the manner of curing the diseases of hot sea-

The importance of the skin, and the variety of its offices, has never been so particularly enquired into, as is perhaps requisite to the understanding of many of the phenomena of the human frame, relative both to health, and to diseases. It is not merely a comprehending organ and a seat of sense; a filtre for our fluids, and the ornamental covering and defence of our whole interior composition; but it seems to me to bear a general relation also to the powers and functions of every internal part, to sympathize with the private actions of each particular viscus, and in short to act in some sort as the regulator of the whole animal system.

sons

sons and climates, but the rational means of preventing them, and of apprising the unwary how to avoid and obviate the dangers of seasons to which they are not accustomed.

The means of prevention, or of preserving the health in such cases, may be comprehended under these three heads: 1. Using proper means to moderate profuse perspiration, and regulate the immediate consequences of it. 2. Preserving the tone and vigor of the cutaneous vessels. 3. Regulating the functions of the first passages, and of their immediate subsidiary, the liver.

1. As to the article of perspiration when it is excessive, it is not by the waste of fluids that people generally

generally suffer, but by their indiscretion in cooling themselves, by courting the cool air and breezes, or fanning themselves. If men have not the opportunity of shifting after violent exercise, profuse sweating, or even after being wetted; instead of exposing themselves to the air, they ought to button close up, and even wrap themselves in a great coat or morning gown, in order to exclude the access of the air to any thing that is wet or damp about them. In case of being wet, indeed, when they cannot change their linen they should, if possible, continue in exercise till their cloaths are perfectly dry. But as to sweating, it is sufficient that they cover themselves and their damp linen from the impression of the air; for they will catch
no

no harm from their skins absorbing again their own moisture, but rather the contrary; for the absorption of saline moisture of any kind is far from being so hurtful and pernicious, as the absorption of cold fresh water only. This is well known to seafaring people, who rarely catch any harm from being wetted with sea water.

It is in the last degree imprudent for people, when they are hot, to indulge their thirst with large draughts of cold water, or even of very small liquors. Spirits, however unseasonable in general, are in cases of excessive sweating, fatigue, or being wet, so far from being hurtful, that a large dram of them is the most seasonable cordial; at once relieving fa-

D

tigue,

tigue, quenching thirst, and resisting the impression of cold moisture upon the skin, by bracing and stimulating the vessels of the stomach, &c. for that has the same salutary re-action upon the skin, as the skin has upon the internal parts.

If gentlemen, or even common men, have it in their power to shift when they are wet, either with sweat or otherways, they ought always to do it, and in doing it they ought to rub their skin with a brush, or pretty hard coarse piece of cloth, till it glows, and then immediately dress — Here I must take occasion to observe, that cotton is a much more suitable cloth than linen, for shirts in warm climates: it is not so cold upon the skin when wet, and it dries sooner than

than linen; if soldiers in the West Indies and other hot climates were obliged to wear coarse cotton shirts, and to have them made both in the neck and in the sleeves without drawing, it would, I believe, be of advantage both to their health and to their cleanliness.

2. For preserving the vigor and tone of the vessels of the skin, so apt to decay so remarkably and insensibly in hot and moist seasons and climates, frequent brisk friction, till the skin is put into a glow, is of great use, as I have intimated before. Cold bathing, where there is any possibility of access to it, should be also regularly practised—but continuing in the water for pleasure, for any length of time, ought by all means to be

avoided, as tending to chill too much the natural heat of the skin, which is too apt to decay of itself in these regions—coming out of the water is another opportunity of using friction—The colder the water used for bathing, so much the better—bathing in sea water, which is I believe accessible over all the West Indies, is preferable to fresh water, as the salt in the water tends to stimulate the finer vessels of the skin—when proper vessels can be procured to bathe in, fresh water is easily made salt †.

† There is a disease, if a certain antidote against all other diseases of hot climates deserves that name, called the *prickly heat*, very common in the West Indies; I am told that soldiers are, with great propriety, forbidden to bathe, when they have that symptom of health upon them, lest they should repell it. I scarcely believe that cold bathing would repell

These articles, however neglected and overlooked, on account of their obviousness and simplicity, would, I believe, be found to be of immense consequence to the *health of soldiers*,

pell it, the paddling too long in the water, till the skin is over-cooled, may: therefore it is a prudent precaution to prohibit bathing to persons with that symptom of health upon them. Almost all spontaneous cutaneous eruptions are critical, and never ought to be repelled but with the greatest caution: yet I am confident that hundreds in this island lose their lives annually by having critical eruptions, under the foolish idea of their being the itch, indiscreetly repelled. The childish idea, I must call it, though patronised by a very respectable character, of the itch being owing to animalculæ, and of sulphur's being their specific poison, has proved the death of multitudes; yet every pretender to physic is, I am ashamed to say it, taught to pronounce instantaneously upon that disease, by inspection between the joints of the fingers; not knowing that it is the tendency of every kind of universal eruption to affect those parts, especially where the skin falls into folds or deep wrinkles.

if

if attended to regularly, whenever they are practicable—But there is one piece of regimen more uncommon, and indeed unthought of, which, I believe, united with a regular observance of the rules above described, would be found a sovereign antidote against the malignity of noxious hot climates and seasons; that is, occasionally anointing the body with a little sweet oil after bathing or friction. Whatever idea we may entertain of this practice among the ancients, and even still among the natives of many countries, as a matter of indelicacy, I am confident it was accounted of great importance among them as a preservative of health. It is equally calculated for resisting the bad influence of *cold*, of *heat*, and of *moisture* upon the body: besides checking

checking that perpetual excess of perspiration, which not only wastes animal fluids, but exhausts the innate heat of the constitution.

I believe our ideas, as to the disagreeableness of anointing, are owing to our inexperience of it: but even granting it to be unpleasant to such as are unaccustomed to the practice, yet the consideration of its being a preservative of health in climates that have so often proved fatal to British constitutions, is sufficient to remove any objection of that kind, to revive its practice, and enforce its utility.— Simple fresh oil for that purpose might be improved both in respect of elegance and of salubrity, by incorporating with it a smaller or greater proportion of some fragrant
essence

essence or aromatic balsam.—The certain effect of oil to be determined even *à priori*, in restraining excess of perspiration, and thereby the waste of natural heat; and in resisting the bad influence of cold and moisture upon the surface of the body, ought to be sufficient to enforce the use of it experimentally. Though I could adduce many medical facts relative to this subject to corroborate my recommendation of reviving the practice of anointing as a prophylactic medicine, this is not the place for it*.

* I must insist upon it, and recommend it to the serious attention of every one concerned, that reason points out anointing as a sovereign antidote and defence against both cold and moisture, and the deleterious consequences of a continued too profuse perspiration.

3. By a proper attention to and regulation of what relates to the first passages, not only all the diseases of the bowels, such as choleras, dry gripes, dysentery, jaundices, might be obviated and prevented; but even that tendency to putridity which so remarkably stigmatizes the diseases of hot climates—1. The whole of this management, so far as relates to medicine, consists in preventing unnatural, which is always diseased, costiveness: by which means that sluggishness of the bowels induced by excessive perspiration is relieved, and the stagnated bile, that encreases excrementitious putridity, is discharged*. For this purpose I would

* No person is secure against an attack of some of the epidemics of hot climates, who has not a natural digestion once every day, besides a gentle laxative at least once in six days.

not recommend laxatives that are intirely cooling; but rather such as at the same time gently stimulate, quickening the inactivity of the bowels, and keeping up the peristaltic motion, by a moderate irritation—

2. In respect of diet—ripe fruits must be very intemperately used indeed, before they can become hurtful—It matters not how little animal food is used in hot seasons and climates—rice is the most natural food in hot climates, and it has many advantages above every other grain. It is as nutritive as any; its dryness makes it keep well; it is wholesome; is easily dressed, and by various dressings it can be made as continually palatable as any species of bread or food. It is a constant and principal dish, not only among the poorer Asiatics, but
at

at their most elegant entertainments ||.

|| No other grain that Europeans have access to, has all the qualities of rice, while it has all the nutritive properties of any other grain—it keeps better than any other grain, or, any biscuit or bread made of them; it requires neither the mill, the sieve, nor the baker; but can be extemporaneously dressed by every body. And if men were at any time reduced to that necessity, the hardship would not be great to eat it dry, while in respect of nutriment, an handful of it would go as far and be more easily carried about with one upon such a pinch, than twice as much bread. A dish of it boiled, with a little butter and sugar added to it, and seasoned with pepper or ginger, makes a very comfortable meal, which bread alone is never accounted, and it is far more wholesome than meat in hot seasons. The many conveniences of this grain should be particularly attended to by them who have the charge of providing for armies. It is not by improvident chance that rice is found to be the native and principal farinaceous production of the light and marshy soil of extensive plains in warmer countries. It is by a determinate providence that the driest grain, which requires the least preparation, is appro-

In all hot countries men ought to be furnished with a proper portion of pepper, ginger, or some other similar seasoning. It may seem preposterous to superficial judges to recommend hot seasonings in hot countries; but they are absolutely requisite, for the same reason that I have recommended a glass of spirits, when people are faint with heat and sweating †.

priated for the food of such as inhabit climates that require such an antidote and corrector of the heat and moisture of the air.

† It is very observable that hot climates abound in these warm aromatic productions that we call hot, but which the inhabitants of these countries experience to be cool and refreshing in their effects, used as seasoning to their food; by stimulating and resisting that internal languor, that the digestive power of the stomach and intestines are so apt to contract from excessive perspiration and want of proper re-action of the skin upon the internal circulation.

It is also remarkable that the acrid productions in our comparatively colder climates, such

We who are accustomed to long kept liquors, have a prejudiced opinion, that fermenting and newly fermented liquors are unwholesome; but that idea is not just. The qualities of what now goes by the denomination of fixed air, generated by fermentation, may convince us of the contrary—as fermenting liquors are great resisters of putrefaction, which property is counterbalanced by no bad quality, they may always be easily had from sugars in plenty, in hot countries, where the process of fermentation is so quick,

as mustard, horse-radish, cresses, scurvy grass, onions, garlic, &c. are generally more volatile in their nature than the ginger, peppers, nutmegs, cloves, &c. of tropical climates. Our volatile stimulants being more adapted to promote a defective perspiration and correct the scorbutic effects of it in our fluids.

and

and it is safer to drink them, at least in part, than too much water, tho' it was always good *.

Little more is requisite in the management of soldiers, in such climates as these observations are calculated for, than that they avoid eating and drinking plentifully at one and the same time. Excess of liquor is doubly unwholesome when it is taken upon a full stomach.

* I suppose that in the West Indies and in all countries where they have long hot seasons, the process of fermentation may be completed in a day or two; and the very great salutariness of a moderate use of new fermented liquors, before their effervescence is quite ceased, as highly antiseptic and resisting all tendency to putridity, will not now be questioned after the various elaborate investigations that have been made into the properties of fixable airs.

We

We know what success has attended the proper management of sailors. I am persuaded, that from the above hints a regimen for preserving the health of soldiers in hot countries may be deduced, that may perhaps prove equally successful and beneficial to our armies.

P O S T S C R I P T.

THE bloody flux is one of the diseases that proves most fatal to Europeans in hot climates. It does not depend on the moisture of seasons or climates, though these may aggravate its symptoms. Its immediate cause is the unremittent heat weakening the digestive action and the peristaltic motion of the bowels, in the manner before described; whence the liver becomes overcharged, and does not admit the blood returning from the intestines so freely as it ought: it regurgitates upon the intestines, and produces choleras, iliac passions, dry gripes, inflammations of the bowels, &c.

but

but most especially it is apt to recoil upon the rectum or lowest portion of the intestines; which inflaming, brings on a tenesmus, or constant pressing to stool, with a discharge of nothing but slime or mucus and blood from the inflamed gut.

I say nothing of the method of curing this disease, which is now pretty well established. I have endeavoured to prove, in my essay on the autumnal dysentery †, that it is, and ought to be treated, as a costiveness; and that nothing can be more repugnant to the cure of it in any of its stages, than astringents, absorbents, or even anodynes, further than as these last are necessary to soothe and allay the grievous pains and unremitting tenesmus, that never give the

† First published in the year 1759.

poor patients a minute's ease. A diarrhœa, or purging of loose excrementitious stools, may admit of the above-mentioned treatment; but I have shewn in that essay, that a true dysentery is the very reverse of a diarrhœa, and cannot be cured but by purging, and vomits acting as purges.

My reason for touching upon this subject here is to inculcate, that the disease may be prevented by the same means by which it must be cured. I am fully persuaded, that no person, while his body is kept regularly open, and his bowels preserved in their natural action, from end to end, will be seized with this disease. Therefore it is on this and on many other accounts a matter of the greatest importance with persons
migrating

migrating into hot climates, and becoming residents there, to guard against costiveness, and by some means or other to keep their constitutions always rather leaning towards the other extreme.

I think it not amiss to subjoin to the above hints, for the benefit of the military, a new proposal in regard to the management of sea water by distillation: though, if what I have to propose is found to succeed, as I apprehend it will, it is more adapted to the service of the navy, than of landmen, yet it may have its occasional use, in respect of them also.

Various methods have been tried, and some of them, by accounts,

with pretty good success, for the sweetening of sea water by distillation: but I wonder it has not occurred to any to do it by discharging the marine acid with one of the stronger acids of nitre, or rather vitriol.

When the marine acid is discharged from its alkaline basis by either of the above acids, being very volatile, it will dispose the water it mixes with to rise in distillation with less force of fire, and consequently to carry less over the helm with it to give the water any disagreeable taste than otherwise; while, if any such substance did rise in the distillation in this manner, the flavour would be quite covered by the agreeable tartness

tartness that the marine acid would impart to the water.

But this, though a great advantage, is in my opinion the smallest one that would be derived from this mode of preparing sea water for internal use. The marine acid is admitted to be one of the most powerful antiscorbutics of any, and to be a great resister of putrefaction; therefore such water, moderately used, would be not only wholesome, but medicinal in all cases where any tendency to dissolution of the fluids was to be obviated. I do apprehend that the marine acid, being very elastic and volatile, would be found more efficacious in this respect than fixable air itself.

N. B.

N. B. Such water would make both very wholesome and very agreeable punch; or by mixing spirits with the water, before distillation, it would be made to rise still more easily, and the distilled water would be found lightly impregnated with a very salutary dulcified marine acid; though indeed the marine acid, perhaps on account of its volatility and weakness, combines more imperfectly with spirits than the stronger acids do.

The residuum would contain a Glauber's salt or a cubical nitre, which might be purified by the fire; though perhaps the nitre might in part de-flagrate with the residuous unctuous parts of the sea water.

I have

I have above intimated the propriety of a glass of spirits in preference to any cooling draughts, when the spirits are exhausted by great heat or fatigue. I here add upon the article of fatigue, that as upon such occasions a glass of spirits or some glasses of wine are great restoratives, and give almost immediate refreshment; so on the contrary, indulging freely in eating at such times is very hurtful, when fatigue has rendered the power of digestion languid and weak: it renders sleep troublesome and unrefreshing, besides afterwards oppressing the habit with a load of crude ill concocted aliments taken into it —when men are much fatigued, they should only eat a little dry bread with some glasses of such liquor as they have access to, and then com-
mit

mit themselves to rest, as warmly covered as possibly they can; for a fatigued person runs a double risk of catching cold by the least exposure during sleep, and consequently of falling a martyr to the predominant epidemic

As the autumnal season in our temperate climates, corresponds most with the nature of hot climates; what I have said in respect of the latter, in the above little tract, may be extended to the autumnal diseases armies are most exposed to in our own regions

F I N I S.