OBSERVATIONS

ON THE

DISEASES OF THE ARMY.

PART II.

IN the firſt part, I have given a general account of the more frequent diſeaſes of the army as they occurred in the courſe of the war. But for particular deſcriptions, for the cauſes, preſervatives, and cures, ſince they muſt have too much interrupted the ſeries of facts that were proper to be preſented in one view, I reſerved them for different parts of this work, and ſhall therefore proceed in this,

I. To divide the diſeaſes into their ſeveral claſſes.

II. To inquire into the cauſes, as far as they depend upon the air, diet, and other of the *non-naturals*.

III. To propoſe ſome means of prevention.

IV. To

IV. To compare the ſeaſons, with regard to health and ſickneſs, in order to compute what number of men may be relied on for ſervice at different times of the year.

CHAP. I.

Of the diviſion of the diſeaſes moſt incident to an army.

THE circumſtances of ſoldiers, in time of war, are different from thoſe of other people, in their being more expoſed to the injuries of the weather, and always crouded together in camps, barracks, and hoſpitals: therefore the moſt general diviſion of their diſtempers may be, into ſuch as ariſe from the intemperance of the weather, from bad air, and from infection.

Military diſeaſes depending on the weather are reducible to two ſorts, *viz.* to thoſe of *ſummer*, and to thoſe of *winter:* or, which is the ſame, to thoſe of the *camp*, and to thoſe of *garriſons*. But as expoſitions to cold are unavoidable upon the firſt encampment, as alſo for ſome time before an army uſually leaves the field, the winter diſeaſes, beginning about the end of Autumn, do not intirely ceaſe before the ſummer is well advanced; and on the other hand, as the heats of ſummer and the damps of autumn diſpoſe the body to ſickneſs, the camp-diſorders do not ceaſe intirely, but continue ſome time after the troops return

return into winter-quarters: ſo that whenever we mention diſeaſes as belonging to ſummer, or winter, to the camp, or garriſon, they are always to be underſtood as protracted in this manner.

If the more general diſeaſes of an army are not to be defined by the ſeaſons, but by the ſtate of the body that accompanies them, we may divide them into the *inflammatory*, and the *bilious* or *putrid;* the inflammatory being the ſame with thoſe of winter, and of the firſt encampment; and the bilious or putrid, the ſame with thoſe of the ſummer and autumn, and with part of thoſe which are carried from the field into the garriſons.

The moſt frequent winter or inflammatory diſorders are coughs, pleuriſies, peripneumonies, acute rheumatiſms, inflammations of the brain, of the bowels, and of other parts, attended with a fever; leſſer inflammations with little fever; and fevers of an inflammatory kind, where no part is ſo ſenſibly affected as to give a name to the diſeaſe. To the ſame claſs may alſo be referred ſuch of the chronic ailments as ariſe from inflammations, whereof the chief are old coughs, conſumptions, and the rheumatiſm without fever. Now all theſe diſtempers come originally from colds, which are ſuppoſed to occaſion a ſuppreſſion of perſpiration at a time when the fibres are moſt braced, the blood condenſed, and the pores of the ſkin and lungs moſt contracted.

But the diſeaſes of ſummer and autumn are of a different nature. During theſe ſeaſons the fibres are relaxed, the fluids are more rarified and diſpoſed to putrefaction; in which ſtate, if any ſtoppage happen to perſpiration, or to any of the excretions deſigned to carry off the more volatile or putrid parts of the blood, a fever is raiſed, which, according to the ſeat of the humours, their acrimony, or the vent given them, appears in the form of a remitting, or intermitting fever, a *cholera*, or a dyſentery. *Hippocrates* aſcribed diſtempers of this nature to a redundance of the bile; and moſt other authors, to a corruption of that humour; ſo that theſe ſummer and autumnal epidemics have been both early and generally called *bilious* *. In effect, in all hot countries, and in camps, where men are ſo much expoſed to the ſun, the gall, if not more abundant, is at this time more diſpoſed to corruption than uſual; and this circumſtance, though probably not the firſt cauſe of the fever, yet ſeems to be the attendant of moſt of the ſummer and autumnal diſorders, and concurs to make them worſe.

But when the ſame cauſes operate more ſlowly, or when the diſeaſes laſt mentioned are but imperfectly cured, the *viſcera* may be obſtructed, or affected in ſuch a manner as to give riſe to various chronic complaints: ſo that conſidering not only the variety, but the frequency of diſtem-

* *Putrid* would be more proper, but I have retained the ancient term *bilious*.

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pers appearing at this time, we ſhall find the ancient maxim that held, "the ſummer and autumn to be the "moſt fickly ſeaſons" *, not only verified with reſpect to the warmer climates, but alſo to a camp, where men are ſo much expoſed to heat and moiſture, the great cauſe of putrid and contagious diſeaſes.

Having laid down this general diſtinction between the ſummer and winter diſorders, it may be proper to diſtinguiſh the parts of both theſe ſeaſons, in order to ſee their influence upon the health, according as either is more or leſs advanced. When the winter begins, the men being thinly clad, are ſubject to coughs, pleuriſies, peripneumonies, and other inflammatory complaints. The ſame continue throughout the ſpring; but as the weather is then milder, the ſickneſs is conſiderably leſs: ſo that this ſeaſon is of all the year the moſt healthful to an army. But, as ſoon as the troops take the field, though no earlier than the firſt, or middle of May, by that change the winter diſorders recur, with ſeveral intermittents and fluxes of an inflammatory kind. In the beginning of June, moſt of the inflammatory or winter diſeaſes diſappear, and what remain are of a milder nature: on this account, and becauſe the autumnal epidemics have yet made no progreſs, this commonly proves the moſt healthful month

* Saluberrimum ver eſt; proxime deinde ab hoc hyems; periculoſior æſtas; autumnus longe periculoſiſſimus. CELS. (ex HIPP. *Aphor.*) lib. ii. cap. i.

of the campaign. July is likewiſe favourable, when the ſummer till then has not been very hot, and when the men have not lain in wet clothes, nor on wet ground; accidents that moſtly give riſe to the dyſentery. But in temperate years, and upon dry ground, the diſeaſes being milder, the remitting fevers and fluxes begin only about the middle or end of Auguſt, at the time when the days are ſtill hot, but when the cool nights bring on dews and fogs. The dyſentery declines with autumn, but the remitting fevers continue as long as the encampment, and never intirely ceaſe till the froſts begin. Laſtly, towards the end of the campaign, the cold weather renews many of the inflammatory ſymptoms, which, ſometimes by themſelves, but generally combined with the remitting fever, make the firſt diſeaſes of the winter.

Although this be the common courſe, yet we may obſerve, that neither the inflammatory nor the autumnal diſorders are ſo ſtrictly confined to their ſeaſons, but that by various accidents they may ſometimes be ſeen out of their place. In theſe matters, though there can be no ſpeaking with preciſion, it is of uſe to know what oftenеſt occurs. In the year 1746, when the troops encamped in the north of *Scotland*, the inflammatory diſeaſes, from the coldneſs of the climate, continued throughout ſummer; and the autumnal were either not ſeen, or were attended with ſo much inflammation, that bleeding made the greateſt part of the cure.

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It is to be further remarked, that as the two ſeaſons run inſenſibly into one another, there will be a mixture and confuſion of the two kinds of diſeaſes. Thus, in the end of June or beginning of July, whilſt the inflammatory ſymptoms recede, the bilious * are advancing; ſo that whatever cauſes bring on an illneſs, it may be either mildly inflammatory, or bilious, or have a mixture of the two. In the ſame manner, towards the decline of autumn, the bilious fevers begin to have additional coughs, ſtitches, rheumatic pains, or ſome other ſymptoms of the winter inflammations.

Laſtly, it is to be obſerved, that the diſeaſes of the winter, and thoſe of the ſummer differ conſiderably as to their cure. Thus, in all winter or inflammatory diſorders, the principal intentions are to diminiſh the force of the blood, to relax the fibres, and to make a revulſion from the parts inflamed; on which account the lancet and bliſters are the chief remedies. But in ſummer and autumn, while the humours are in a putreſcent ſtate, and the ſolids too much relaxed, ſuch medicines are moſt wanted as clear the firſt paſſages, correct or expel the more corrupted parts of the fluids, and brace the fibres; hence vomits, purges, acids, and the Bark are at that time of the greateſt ſervice.

* By this term, *bilious*, I would all along mean nothing more than the remitting and intermitting fevers, and the dyſentery, which are commonly attended with corrupted bile, without referring the firſt cauſe of theſe diſorders to that humour.

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Thus far we may claſs the diſeaſes depending upon the ſeaſons, or the weather. It remains to conſider ſuch as proceed from foul air, and from contagion. The moſt fatal are the dyſentery and hoſpital-fever, which, though ariſing from other cauſes, ſpread moſt by infection. As to the ſmall-pox and meaſles, they were never general, and therefore I ſhall not rank them among the epidemics of an army.

The *lues venerea* and itch are infections of a different kind. The firſt, not being more incident to ſoldiers than to other men, I ſhall likewiſe paſs over; but the latter, being ſo frequent in camps, barracks and hoſpitals, may be reckoned one of the military diſeaſes; and as ſuch ſhall be treated of in its proper place.

CHAP. II.

Of the cauſes of diſeaſes moſt incident to an army.

IT appears from the firſt part, that the moſt frequent diſeaſes of an army are owing either to the ſenſible changes in the air, and ſo have revolutions and periods like the ſeaſons on which they depend; or to ſuch accidents as are almoſt unavoidable in a military life. Wherefore it will be proper to have a thorough knowledge of both

both theſe cauſes, in order to find out ſome means for preventing their worſt effects.

§ 1.

Of the diſeaſes occaſioned by heat, and by cold.

GREAT heats are never ſo much the immediate as the remoter cauſe of a general ſickneſs, by relaxing the fibres and diſpoſing the humours to putrefaction whilſt the men are the whole day expoſed to the ſun *. This was the caſe in every campaign, where it was obſervable, that no epidemic ever enſued upon the greateſt heats till the perſpiration was ſtopped by wet clothes, wet beds, dews, or fogs, and then ſome bilious or putrid diſtemper was the conſequence. In the campaign of 1743, though the weather continued long hot, yet we had no great ſickneſs till the men lay wet after the battle of *Dettingen*, and then the dyſentery immediately appeared †. Again, in the year 1747, the ſummer was likewiſe hot, but without any bad effects till towards the end of Auguſt, when

* Soldiers in a camp ſuffer a great deal from heat, by being conſtantly expoſed to the ſun, either without any ſhade at all, or only ſheltered by a thin tent; and where the air being ſo much confined, the heat is often more inſupportable than without, in the ſun. This circumſtance, joined to the damps of a camp, ſeems to be the cauſe that the ſummer and autumnal diſeaſes of an army, even in a northern latitude, reſemble ſo much the epidemics of ſouthern countries, eſpecially of thoſe with a moiſt air.

† Part I. chap. iii.

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the nights growing cool, the dews and night-fogs occaſioning a ſtoppage of perſpiration brought on the ſame diſtemper *. And in the laſt campaign, though the heats were great, yet they were the cauſe of little ſickneſs till the troops were cantoned in the marſhes; where a conſiderable degree of putrefaction and moiſture being joined, the ardent, remitting, and intermitting fevers, and fluxes, were only the remoter effects of that heat †.

Nevertheleſs we muſt allow that the heats have been ſometimes ſo great as to prove the more immediate cauſe of particular diſorders: as when centinels were placed without cover, or frequent reliefs, in ſcorching heats; or when the troops marched, or were exerciſed in the heat of the day; or when the men imprudently lay down and fell aſleep in the ſun; all which circumſtances were apt to bring on diſtempers varying according to the ſeaſon. In the beginning of ſummer, ſuch errors produced inflammatory fevers; and in the end of it, or in the beginning of autumn, a remitting fever, or a dyſentery.

But cold is oftener the more immediate cauſe of diſeaſes, and is hurtful two ways; either when pure, or attended with moiſture; of which the laſt is the worſt. The diſorders ariſing from cold weather are all of the inflammatory kind, *viz.* coughs, pleuriſies, peripneumonies, rheu-

* Part I. chap. vii. † Part I. chap. viii.

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matic pains, and the like; together with conſumptions, which in the army are almoſt always owing to neglected colds. The mildneſs of our winters, and the little duty of our troops in time of peace, make expoſitions to cold leſs frequent at home. But in war, it is to be remembered what a change a ſoldier undergoes, from warm beds and the landlord's fire-ſide in *England*, to cold barracks, ſcanty fuel, and ſharp winters in the *Netherlands*; and all this without any addition of clothes. Now, how liable our men were to take cold, was ſeen in the account of the firſt garriſon-ſickneſs, and of the diſeaſes in the beginning and end of every campaign.

§ 2.

Of diſeaſes occaſioned by moiſture.

MOISTURE is one of the moſt frequent cauſes of ſickneſs. In the account of the diſeaſes of the firſt winter, we obſerved how much the men ſuffered by damp barracks, eſpecially at *Bruges*. The ſame remark was repeated in the next winter, and in the campaign of 1745. But ſoldiers are moſt liable to damps in their tents, where the air can never be thoroughly dry, by reaſon of a conſtant exhalation, and is often very moiſt from rains. Theſe damps are common to all camps, and particularly to thoſe in the lower and wetter parts of the *Netherlands*. But

obſerve, that neither canals, nor even large inundations where the water is deep, are nearly ſo dangerous, or exhale ſo much noxious vapours as marſhy grounds, or meadows that have been once floated and but lately drained; and that fields, though dry in appearance, may yet be moiſt by the tranſpiration of ſubterraneous water.

The moiſture of a ſeaſon is commonly eſtimated by the quantity of rain, whereas it depends more on the conſtancy of moiſt winds, whether they bring great rains or none at all *; but moſt of all upon cloſe weather, eſpecially in low and woody countries. In one caſe, rains will cauſe a dangerous moiſture of the air, when the water ſtagnates and corrupts in low grounds after land-floods; but otherwiſe, in the flatteſt countries, if provided with drains, frequent ſummer-ſhowers have a ſalutary effect, by tempering the heat, refreſhing the ſtagnating water, and precipitating all putrid exhalations †. It is remarkable that peſtilential diſeaſes have frequently occurred in dry and hot ſummers ‡; and agreeably to this, I have

* I made no experiments on the dryneſs and moiſture of different winds in the *Netherlands*; but truſted to the accounts of others. MUSSCHENBROEK reckons all their northerly winds drying, but the eaſt and north-eaſt the dryeſt, and the weſt and ſouth-weſt the moiſteſt. *Vid. Inſtitut. Phyſic. cap.* xlii. Compare Ld. BACON's Nat. Hiſt. cent. viii. exp. 786.

† Vide part I. ch. 1.

‡ Vide Ld. BACON's Nat. Hiſt. cent. iv. exp 383. DIEMERBR. de *Peſt. lib.* I. *cap.* viii. and of this work, part iii. ch. iv. § 4.

obſerved

obſerved that the moſt ſickly ſeaſons in the field have been attended with the greateſt heat, and the leaſt rain. But it will be proper to add, that though rains in ſummer may be generally conducive to health, yet they will be of bad conſequence when the men are obliged to march in them, or lie upon the ground whilſt it is wet with them.

Cold and moiſt air affecting the body, in winter produced many inflammatory diſorders, and relapſes into ſuch diſtempers as the men had been firſt ſeized with in autumn; and this effect was ſtill more manifeſt in the ſpring and beginning of ſummer, upon our firſt taking the field.

But the conſequences of moiſt air, after great heats of the weather and rarefaction of the blood, are more dangerous. For moiſture relaxes the fibres, as well as ſtops perſpiration; and when the humours are ſo much diſpoſed to corruption by the heat, it is not ſurprizing that the dyſentery and the bilious fever, both putrid diſeaſes, ſhould enſue.

The too great dryneſs of the air has likewiſe been mentioned by authors as the cauſe of epidemic diſeaſes, but I imagine, without reaſon. For, whether in winter-quarters, or in camps, the ſoldiers are always expoſed to too much moiſture. And as for the great droughts in ſummer, we are never thence to infer an over-dryneſs

of the air; for as long as there are vegetables to perſpire, the air will ſcarce ever want humidity ſufficient for health; ſo that perhaps it is in the ſandy deſarts only we can learn what diſtempers are incident to men breathing in too dry an atmoſphere.

§ 3.

Of diſeaſes ariſing from putrid air.

I SHALL next conſider how the air is changed by putrefaction, which of all other cauſes of ſickneſs is the moſt fatal and the leaſt underſtood. This bad air ſo hurtful to an army may be divided into four kinds: the firſt, ariſing from the corrupted water of marſhes; the ſecond, from human excrements lying about the camp, in hot weather, when the dyſentery is frequent; the third, from ſtraw rotting in the tents; and the fourth kind, is that which is breathed in hoſpitals crouded with men ill of putrid diſtempers. Of this ſort alſo, but in a leſſer degree, is the air of full barracks not kept clean; and of tranſport-ſhips, when the men have little room, and are long on board.

As to the firſt kind of bad air, it may be obſerved, that during the late war the whole army never happened to encamp ſo near the marſhes as to receive any ſenſible harm thereby; but detachments have ſuffered from

from this cauſe; as one did in *Zealand*, another in the lines of *Bergen-op-Zoom* *; and in the laſt year of the war, a great part of the troops, being cantoned near the inundations of *Bois-le-duc*, became extremely ſickly †. Now, as the exhalations from marſhes do not conſiſt of watery vapours only, but alſo of putrid *effluvia* ariſing from innumerable vegetables and inſects that die and rot in them, it is no wonder that the diſtempers incident to thoſe who breathe ſuch air ſhould be of ſo malignant a nature; and that bilious fevers and fluxes ſhould be ſo frequent, infectious and dangerous in thoſe countries ‡.

Next to marſhes, the worſt encampments are on low grounds cloſe beſet with trees; for the air is then not only moiſt and hurtful in itſelf, but by ſtagnating becomes more ſuſceptible of corruption from the filth of the camp.

The ſecond and third kinds of bad air are owing to the privies of a camp, and to rotten ſtraw. Both theſe are always offenſive; but while the bloody flux prevails, as they contain the putrid excrements and *effluvia* of the ſick, they are then more infectious and dangerous. At certain ſeaſons, the moſt healthy have ſome diſpoſition to the dyſentery, which might go eaſily off, were it not for ſuch deſtructive ſteams which work like a ferment and ripen the diſtemper.

* Part i. ch. vii. † Part i. ch. viii. ‡ Vide part i. ch. vii. and viii.

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The laſt ſource is from hoſpitals, barracks, tranſport-ſhips, and in a word from every crouded place, where the air is ſo pent up as not only to loſe part of its vital principle by frequent reſpiration, but alſo to be ſubject to corruption from the perſpirable matter, which, as it is the moſt volatile part of the humours, is alſo the moſt putrefcent. Hence it is, that in proportion to the naſtineſs of ſuch places, to the number of dyſenteries, of foul ſores, and eſpecially of mortifications, the malignant fever is both frequent and mortal *.

§ 4.

Of diſeaſes ariſing from errors in diet.

IRREGULARITIES in diet are commonly, but unjuſtly, ſuppoſed to have the greateſt ſhare in producing military diſeaſes. Were this the caſe, the changes in the weather and ſeaſons would not ſo ſenſibly affect the health of ſoldiers; the ſobereſt and moſt regular corps would not be ſo ſickly; different nations in the ſame camp, living variouſly, would not be afflicted with the ſame diſtempers: nor would there be ſuch an inequality in the numbers of the ſick in different years, were the greateſt part of the diſeaſes owing to any other cauſes, than what have been

* This ſubject, of diſeaſes ariſing from putrid air, will be more fully treated in Part iii. ch. vi. § 6.

already

already aſſigned. All therefore that can be admitted on this article is, that there may be certain rules of diet, by the obſervation of which, ſoldiers may be made ſomewhat leſs liable to ſickneſs; but there can be none propoſed that will make any conſiderable exemption, if the weather, ground, and other circumſtances do not concur to favour them *.

A ſoldier in time of war, by the ſmallneſs of his pay, is ſecured againſt exceſs of eating, the moſt common error in diet. The danger is on the other hand; for when all are not obliged to eat in meſſes, ſome will be apt to ſpend their money upon ſtrong liquors, and to ſquander away in one day what is but bare maintenance for a week. But when every man is obliged to contribute his ſhare to a meſs, we may be aſſured there can be no errors in diet of conſequence, whilſt almoſt the whole pay is beſtowed upon common food. For as to the abuſe of ſpirits, and fruit, and drinking bad water, however generally they have been accuſed, I ſhall venture to affirm, that theſe three cauſes combined never occaſioned the tenth part of the ſickneſs in the army.

Firſt as to ſpirits, it is to be obſerved, that even when drunk to exceſs, they tend more to weaken the conſtitu-

* This article, upon diet, is only to be underſtood as relating to men in health, and not to the ſick, who are always ſuppoſed to be under the ſtricteſt regulations of diet, depending on the hoſpital, and never left to themſelves or their nurſes.

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tion than to produce any of the common camp-diſeaſes; or if ſome actually fell ill after hard drinking, it is certain a far greater number are preſerved by taking theſe liquors in moderation. Let us not confound the neceſſary uſe of ſpirits in a camp, with the vice of indulging them at home; but conſider, that ſoldiers are often to ſtruggle with the extremes of heat and cold, with moiſt and bad air, long marches, wet clothes, and ſcanty proviſions. Now, to enable them to undergo ſuch hardſhips, it is proper that they ſhould drink ſomething ſtronger than water, or even than ſmall-beer, which is always new and bad in camps, and even there too dear for their common uſe.

And as to fruit, another ſuppoſed cauſe of the camp-fever and dyſentery, it muſt be ſtill more innocent; ſince theſe diſeaſes being either of an inflammatory, or a putrid nature, cannot be owing to what is acid. Were the dyſentery the effect of eating too much fruit, ſhould we not find it more common among children? Nor indeed are the ſoldiers over-fond of it; or if they were, have they means to purchaſe it. We can ſcarce imagine when the daily pay, after ſtoppages, can but juſt procure a pound of good meat, that a man will beſtow any part of it upon fruit. A few diſorderly men may rob orchards, but the dyſentery and camp-fevers are diſeaſes to which the moſt regular are equally ſubject. It may be further remarked,

remarked, that our worſt flux began in the end of June *, when there was no other fruit to be had but ſtrawberries, which the ſoldiers never taſted; and that the ſame diſtemper intirely ceaſed about the firſt of October, when the grapes were ripe, and ſo plentiful in open vineyards that the men ate what quantity they pleaſed. To theſe arguments, add the authority of *Sydenham*, who never mentions fruit as the cauſe of the dyſenteries which were epidemic in *London* in his time †; and *Degner*, another diligent obſerver, and the author of a treatiſe on this diſeaſe, expreſsly ſays, that fruit had no ſhare in producing the dyſentery which raged ſome years ago at *Nimeguen* ‡.

This point being then ſo plain, it may ſeem ſtrange how a contrary opinion ſhould have ſo generally gained belief, if it be not thus accounted for. The bloody flux uſually coincides with that ſeaſon in which fruit is in the greateſt plenty; and as fruit is laxative and apt to gripe, it was natural to aſſign no other cauſe for the dyſentery than eating it immoderately; and the rather as the true cauſe was ſo little obvious. But beſides that ſtrong people are little ſubject to a looſeneſs from ſuch a cauſe, we may obſerve how different the camp-dyſentery is from a *diarrhœa*, in ſymptoms, danger, and cure. It may be allowed, that eating too much fruit diſpoſes the body to agues, eſpecially in a moiſt country; but the remitting fever of

* Part i. ch. iii. † Op. § 4. cap. iii. ‡ Hiſt. Dyſent. cap. ii. § 30.

the camp is ſomewhat of a different nature, as being moſtly attended with a ſenſible inflammation. But granting, that fruit is capable of producing both fevers and fluxes, ſuch as prevail in an army, yet in ſome hundreds which have been under my care for theſe diſtempers, as I never, upon the ſtricteſt inquiry, diſcovered this to be the cauſe, I muſt conclude that it rarely takes place, and may be well omitted in the account. At the ſame time it will be proper to obſerve, that whoever is actually under the cure of a flux, or but lately recovered, ſhould be cautious with regard to fruit; for, though the acid may be good for correcting the diſpoſition to putrefaction, yet the bowels may be too much relaxed, and in too tender a ſtate to bear any ſharp, cold, or flatulent aliment. For the ſame reaſon, thoſe who have lately recovered of intermittents, muſt either forbear eating it, or uſe it moderately. Nor ſhould the moſt healthy perſon eat freely of it in cloſe and marſhy countries; becauſe whatever is of ſo very cooling and relaxing a nature, may too much weaken the habit, and thereby check perſpiration; by which means fruit, though really acid, may lay the foundation of ſome putrid diſeaſe.

Laſtly, that many diſeaſes are owing to bad water, has been an ancient and prevailing opinion; and even *Hippocrates* refers various diſorders to that cauſe. But, without entering into an inquiry about the juſtneſs of ſuch

notions, I ſhall only remark, that we are not to apply what is ſaid of the water in the country where that author practiſed, to what our army commonly drank, which was plentiful and good. The only exception worth notice was in *Zealand*, where the water being indeed leſs pure, it might concur with other cauſes in making the ſickneſs more general in that country *. But in all other places our water was blameleſs, and particularly in the two ſeaſons during which the bloody-flux was moſt epidemic †.

To conclude, whoever will peruſe the account of the ſeveral campaigns, will ſee ſuch an uniformity in the riſe and periods of the diſeaſes, and that ſo much connected with the ſtate of the air, as will be ſufficient to convince him, that neither the abuſe of ſpirits, nor of fruit, nor drinking bad water, could have any conſiderable ſhare in producing them.

§ 5.

Of diſeaſes ariſing from exceſs of reſt, and motion; of ſleeping, and watching; and from want of cleanlineſs.

THE life of a foot-ſoldier is divided between the two extremes of labour and inactivity. Sometimes he is

* Part I. chap. i. and vii.

† *Viz.* In the camp at *Hanau*, in the year 1743; and at *Maeſtricht* 1747. See part i. chap. iii. and vii.

ready to ſink under fatigue, when having his arms, accoutrements and knapſack to carry, he is obliged to make long marches, eſpecially in hot or rainy weather: though the moſt frequent errors of men of that rank are on the ſide of reſt. But the cavalry lead a more uniform life, having little fatigue by marches, and a conſtant but eaſy exerciſe, both in the field and in quarters, in the care of their horſes; one reaſon for their better health.

Sometimes the ſervice requires ſuch frequent returns of duty, that the men have not time to ſleep; but ſuch occurrences are rare, and generally when ſoldiers are off duty they ſleep too much, which enervates the body, and renders it more ſubject to diſeaſes.

It is well known how neceſſary it is to keep up the perſpiration; and alſo, how much the uncleanlineſs of the perſon will concur with other things to fruſtrate that intention. I have obſerved in the hoſpitals, that when men were brought in from the camp with fevers, nothing ſo much promoted a *diaphoreſis*, as waſhing their feet and hands, and ſometimes their whole body, with warm water and vinegar, and giving them clean linen. So that officers judge rightly with reſpect to the health of the men, as well as to their appearance, when they ſtrictly require cleanneſs in their perſons and clothes.

Under this head, it will be proper to mention the itch, the moſt general diſtemper among ſoldiers. This ſpreads ſo

ſo eaſily by the contact of the foul perſon, or of his clothes, that one in the ſame tent, meſs, or barrack, will often communicate it to the reſt: this circumſtance, joined to the little attention which men of that rank have to cleanlineſs, makes it difficult to keep it under, though the cure of each individual be generally eaſy.

CHAP. III.

Of the general means of preventing diſeaſes in an army.

ALTHOUGH moſt of the forementioned cauſes depend on the changes of the air, and other circumſtances which can ſcarce be avoided, yet as all theſe only diſpoſe the body to ſickneſs, and do not neceſſarily bring it on, it follows, that ſuch proviſion may be made, as ſhall prepare the ſoldier to withſtand moſt of the hardſhips incident to a military life. But as this maxim cannot hold ſtrictly with a multitude, it can only be admitted ſo far, as a large body of men, loſing but a few by ſickneſs, may be ſaid to be healthy. I need ſcarce add, that the preſervatives from diſeaſes are not to depend on medicines, nor on any thing which a ſoldier ſhall have in his power to neglect; but upon ſuch orders only, as, at the ſame time that they do not appear unreaſonable to him, he ſhall be made to obey.

We

We ſhall therefore inquire into the means of preſervation from ſickneſs, in the order of its cauſes before-mentioned *; whereof the chief depending on the air, we ſhall conſider the proper precautions to be uſed in regard to that; and ſhall next propoſe ſome regulations about the diet, and other points that may fall under the direction of the officers.

§ 1.

How to prevent diſeaſes ariſing from heat, and cold.

TO palliate the effects of intemperate heat, commanders have found it expedient ſo to direct the marches, that the men ſhould come to their ground before the heat of the day; and to give orders that none of them ſleep out of their tents, which in fixed encampments may be covered with boughs, to ſhade them from the ſun †. It is a rule of ſome importance, to have the ſoldiers early out, and exerciſed before the cool of the morning is paſſed; for by that means not only the ſultry heats are avoided, but the blood being cooled, and the fibres braced, the body will be better prepared to bear the heat of the day. Laſtly, in hot weather, it will be found proper to ſhorten the centinel-duty, whenever the men are to ſtand without any ſhade.

* Ch. ii.

† Ne aridis, et ſine opacitate arborum, campis aut collibus, ne ſine tentoris æſtate, milites commorentur. VEGET. *De Re Milit. lib.* iii. *cap.* ii.

The

The preſervatives from cold conſiſt of clothes, bedding, and fuel. The experience which we have had of the uſe of under-waiſtcoats, during the winter-campaign in *Great-Britain* *, ſhould teach us to make the ſame proviſion for the whole army, in any future war. None of the foreign ſoldiers are without this neceſſary part of clothing; and indeed no man of the meaneſt condition abroad. Under-waiſtcoats would not only be uſeful in winter-quarters, but greatly ſo, on firſt taking the field, and towards the end of the campaign. How much likewiſe watch-coats were wanted for centinel-duty, appeared from the general account of the diſeaſes during the firſt winter. A third article, is to provide ſtrong ſhoes for the ſoldiers; for it is well known how eaſily men catch cold by wet feet.

The ſecond means of preſervation mentioned was bedding, by which is underſtood a blanket for every tent of the infantry. This proviſion, regarded by other nations, has generally been neglected both by the *French* and our army. We have obſerved of what advantage the cloaks were to the cavalry; how uſeful therefore blankets muſt be in preſerving the health of the foot, in the beginning and end of a campaign, is obvious. The only point to be conſidered is, whether the expence, and impediment of ſo much baggage, will over-balance that advantage †.

* Part 1. chap. vi.

† Since the firſt editions of this work, all the foot upon ſervice have been provided with blankets.

The

The laſt article was fuel. Of this our ſoldiers might require a greater ſupply, as being of all military people the leaſt inured to cold: but, as bearing ſome degree of it in winter-quarters may tend to harden them againſt an early campaign, all that is requiſite, is to give them enough for dreſſing their victuals, correcting the dampneſs of their barracks, and the rigour of a ſevere winter; and to truſt rather to their warmer clothes and exerciſe, than to fire, for preventing diſeaſes ariſing from cold. We find theſe two articles of clothes and fuel particularly recommended to the care of commanding officers by *Vigetius*, an author who has preſerved the maxims of the old *Roman* diſcipline *.

§ 2.

How to prevent diſeaſes ariſing from moiſture.

WHEN troops are to go into garriſon, it is the buſineſs of the quarter-maſters to examine every barrack offered by the magiſtrates of the place, and to reject all ground-floors in houſes, which either have been uninhabited, or have any ſigns of moiſture. We had an inſtance of the comparative dryneſs of upper ſtories †, which are always

* Non lignorum patiantur (milites) inopiam, aut minor illis veſtium ſuppetat copia; nec ſanitati enim nec expeditioni idoneus miles eſt, qui algere compellitur. *De Re Milit. lib.* iii. *cap.* ii.

† Vid. part i. chap. ii.

always preferable, and particularly in the *Netherlands*, where the houſes are without drains. But if dry habitations cannot be procured, the only reſource againſt ſickneſs from moiſture will be an increaſe of fuel.

In the field, the beſt ſecurity is by making trenches around the tents; by which means not only the natural moiſture of the ground is leſſened, but the rain-water is intercepted and carried off without wetting the ſtraw. This is always neceſſary when a camp is to remain above a night or two on the ſame ground.

It is of great importance to allow the ſoldiers plenty of ſtraw, and to have it often renewed; for a dry and freſh bedding is not only comfortable, but a preſervative againſt diſeaſes, and one reaſon of the better health which ſoldiers generally enjoy upon ſhifting ground, as the damp or rotten ſtraw is then left behind. But in fixed camps, when the ſtraw is not often enough changed, it will be proper to have the tents opened every day for ſome hours; and once in a few days to have all the ſtraw taken out and well aired: without this precaution it will not only grow damp, but ſoon rot and prove unwholeſome.

It will alſo be neceſſary for the officers to air their tents daily; without which every thing will contract moiſture. They are farther to be adviſed not to lay their matraſs upon the graſs, but to raiſe their bedding from the ground,

or to uſe a bed-ſtead. Oil-clothes ſpread on the ground of the tent, and kept dry, intercept much of the riſing vapour. Towards the end of the ſeaſon, when the weather grows cold and damp, it will be found uſeful to burn ſpirits in the evening, in order to warm and correct the air in the tent. But at no time are the officers to confine the air too much, not even in cold weather, and eſpecially when ſick; taking it for a rule, that there is more danger in breathing in a moiſt atmoſphere, loaded with their own *effluvia*, than in an open tent with a cloſe marquiſe.

Soldiers are unavoidably expoſed to rain on marches and out-duty, and upon having wet-clothes are liable to ſickneſs, unleſs they be allowed to cut down wood to burn in the rear of the camp; an indulgence which I have obſerved to be neceſſary on theſe occaſions.

Where the grounds are equally dry, the camps are always moſt healthful on the banks of large rivers; becauſe in the hot ſeaſon, ſituations of this kind have a ſtream of freſh air from the water, tending to carry off both the moiſt and putrid exhalations. And in cantonments, we are not only to ſeek villages removed from marſhy grounds, but ſuch as are leaſt choaked with plantations, and ſtand higheſt above the ſubterraneous water. In moiſt countries, towns are generally preferable to villages, or ſingle dwellings, for the reaſons already given *.

* Part I. chap. i. and chap. viii.

§ 3.

§ 3.

How to prevent diſeaſes ariſing from putrid air.

HAVING in the laſt chapter mentioned the common ſources of putrid air affecting an army, I ſhall now offer a few conſiderations upon the means of removing, or leſſening each in particular.

Firſt, with regard to the putrid air of marſhes and other ſtagnating water, the preſervatives mentioned under the article of moiſt air are in a great meaſure applicable here. If the military operations ſhall oblige an army to continue long upon ſuch ground, the beſt expedient will be to make frequent removes *; for, by ſhifting, the ſtraw will be changed, the men will have more exerciſe, and the privies will be left behind, which in camps are more than ordinarily noxious on account of the frequency of the dyſentery.

As for cantonments in marſhy grounds, if the troops muſt remain there in the dangerous ſeaſon, it will be better to float the fields intirely, than to leave them half dry: for the ſhallower the water is, the more it will

* Si autumnali æſtivoque tempore diutius in iiſdem locis militum multitudo conſiſtat, ex contagione aquarum et odoris ipſius fœditate, vitiatis hauſtibus, et aëre corrupto, pernicioſiſſimus naſcitur morbus, qui prohiberi aliter non poteſt niſi frequenti mutatione caſtrorum. VEGET. *De Re Milit. lib.* iii. *cap.* ii.

corrupt, and the evaporation will alſo be greater in proportion. The regiment at *Helvoirt*, which lay off the inundation about half a league only, was an inſtance how near troops may lie to marſhes without any remarkable ſickneſs *; at leaſt if the wind ſhould carry the vapours a different way. Commodore *Mitchel*'s ſquadron in *Zealand*, and the healthy cantonments at *Eyndhoven*, *Lind* and *Zelſt*, in a ſickly neighbourhood, afforded more inſtances of the ſame nature †. Nay, it has been obſerved at *Rome*, that the ſphere of malignant vapours from the adjoining marſhes has extended to thoſe parts only which lay nearеſt them, occaſioning bad fevers there, whilſt the reſt of the city was healthful ‡. Thus, ſometimes a little remove from the marſhes may prevent a general ſickneſs; but if that be inconſiſtent with the ſervice, as happened in the campaign of 1747, when ſome battalions were ſent to *Zealand*, and in the ſummer following, when our troops were cantoned among the inundations, we muſt be content to palliate what we cannot avoid. But as this is chiefly to be done by diet and exerciſe, we ſhall poſtpone the rules, till we come to treat of thoſe articles.

Whenever the dyſentery begins to ſpread, the beſt means of preſerving health are to leave the ground, with the privies, foul ſtraw, and other filth of the camp; which

* Part 1. chap. viii.

† Part 1. chap. vii. and chap. viii.

‡ LANCIS. De Nox. Palud. Effluv. lib. ii. epid. i. cap. iii.

method

method is to be repeated once or twice more, or oftner, if conſiſtent with the military operations; or at leaſt till the middle of *September*, when the danger is in a great meaſure at an end. The firſt campaign furniſhed a good argument for this practice; for the long continuance on the ſame ground, at *Hanau*, kept up the rage of the dyſentery, which, upon decamping, ſuddenly abated *. And in the year 1745, the flux was milder than ever was known, which we imputed not only to the coolneſs of the ſeaſon, but alſo to the frequent removes during the time that the army was moſt liable to the diſtemper †. But if any circumſtance ſhould make it improper to change the ground, when the dyſentery begins to ſpread, other methods muſt be taken to check its progreſs.

In order therefore to preſerve a purity of air in the the dyſenteric ſeaſon, let there be ſome ſlight penalty, but ſtrictly inflicted, upon every man that ſhall eaſe himſelf any where about the camp, but on the privies. Further, from the middle of July, or upon the appearance of a ſpreading flux, let the privies be made deeper than uſual, and once a day a thick layer of earth thrown into them, till the pits are near full, which are then to be well covered, and ſupplied by others. It may alſo be proper to order the pits to be made either in the front or rear, as the then ſtationary winds may beſt carry off their *effluvia* from

* Part i. chap. iii. † Part i. chap. v.

the

the camp. Moreover, it will be neceſſary frequently to change the ſtraw, as not only apt to rot, but to retain the infectious ſteams of thoſe who have fallen ill of the diſtemper. But if freſh ſtraw cannot be procured, more care muſt be taken in airing the tents and the old ſtraw, as before directed.

Laſtly, when the diſeaſe begins to be frequent, the ſick ſhould not be ſent to one common hoſpital; at leaſt not in ſuch numbers as to vitiate the air, ſo as not only to communicate the infection to others, but to keep it up among themſelves. This rule will be much enforced by attending to the facts mentioned in the account of the campaign in *Germany* *, compared with what paſſed in the ſummer 1747 †. Therefore when the dyſentery prevails, the regimental ſurgeons are to treat the ſlighter caſes in the camp itſelf, and as many of the reſt as they can conveniently attend or accommodate in the regimental hoſpitals, which are then particularly to be choſen ſpacious and airy. Barns, granaries and the like places, will allow the ſteams to diſperſe, without any danger from cold, ſince the weather is uſually warm during that ſeaſon. As to the general hoſpital, let it receive ſuch only as the regimental hoſpitals cannot well contain, and the ſick that cannot be moved with the army. Without this diſperſion of the ſick, the general hoſpital may, in

* Part I. chap. iii. † Ibid. chap. vii.

bad

bad ſeaſons, be charged with ſome thouſands, who cannot be well attended, but by a greater number of phyſicians than has been allowed by the public. But, were that objection removed, it would be ſtill unadviſeable to have but one common hoſpital, on account of the mortality that uſually enſues upon crouding together ſuch a number of men, ill of ſo putrid a diſeaſe.

Having, in the account of almoſt every campaign, mentioned the fatal effects of the hoſpital-fever, I need not urge the neceſſity of uſing precautions againſt it. Without entering upon a particular deſcription of its nature, which is reſerved for the third part of this work, I ſhall at preſent only propoſe the means whereby this diſeaſe may be kept either from appearing at all, or, at leaſt, with ſo much contagion and danger. Theſe means ſhall be conſidered under two heads; one, relating to the choice of hoſpitals; and the other, to the right management of the air therein.

In treating of the bloody-flux, the moſt airy and ſpacious houſes, to be procured in the neighbourhood of the camp, were recommended, for the better recovery of the ſick, and for guarding againſt infection. Now the ſame means will alſo tend to prevent the hoſpital-fever, as the dyſentery is ſo apt to breed it *. On theſe occaſions, it is

* The putrid *effluvia* of the dyſenteric *fæces* are not only apt to propagate the dyſentery, but likewiſe to breed the jail or hoſpital-fever, with, or without bloody ſtools.

common to look out for close and warm houſes, and therefore to prefer a peaſant's houſe to his barn; but experience has convinced us, that air, more than warmth, is requiſite. For this reaſon, not only barns, ſtables, granaries and other out-houſes, but, above all, churches make the beſt hoſpitals, from the beginning of June till October. Of this there was an inſtance in the campaign of 1747, when a large church at *Maeſtricht* was applied to that uſe; and where, notwithſtanding above an hundred lay in it, with foul ſores, fluxes, and other putrid diſeaſes, for three months together (during the greateſt part of which time the weather was very hot) there was no appearance of this fever *. Therefore we may lay it down as a rule, that the more freſh air we let into hoſpitals, the leſs danger there is of breeding this diſtemper.

Another point to be obſerved in a fixed camp, is to have the regimental hoſpitals ſcattered, and not crouded into one village. And for the ſame reaſon, if it ſhould be neceſſary for the general hoſpital to admit a great number at a time (which muſt frequently be the caſe, upon the motion of an army after a long encampment) it will be proper to have the ſick diſperſed into two or three villages, rather than kept in one; though a narrower compaſs may be more for the œconomy of the hoſpital, and the eaſier attendance on the ſick. The want of pure and

* Part 1. chap. vii.

wholeſome

wholeſome air can never be compenſated by diet or medicine: ſo that there appears the greater neceſſity of carrying, at all times, as many of the ſick along with their regiments as can eaſily be tranſported in waggons.

It may be neceſſary to add the following diſtinction. In the firſt part of a campaign, when inflammatory diſtempers prevail, thoſe who are taken ill are to be left behind, as ſuch caſes leaſt admit of motion, and at the ſame time are not infectious. But thoſe who fall ill from the end of ſummer to the decline of autumn, as having diſeaſes of a putrid kind, but which bear motion and generally mend upon a change of air, are rather to be carried with their regiments and diſperſed, than collected into one general hoſpital to propagate the infection.

As theſe regimental hoſpitals are of ſuch conſequence, it would be proper to ſupply them with blankets and medicines from the public ſtores, with an allowance alſo for nurſes and other neceſſaries. Nor is this care requiſite in the field only, but alſo in winter quarters; as there will generally be more ſick, on breaking up camp, than can be well attended by the phyſicians upon the eſtabliſhment. In the campaign 1743, about 3000 were left in the general hoſpitals; and in the year 1747, upon going into winter-quarters, the *returns* of the ſick amounted to 4000. In the courſe of the war, one phyſician has ſometimes had the charge of 700 at a time; in which caſe, though

the hoſpital might be ſaid to have a phyſician, it could reap little advantage from his attendance. But ſuppoſe, that a ſufficient number of phyſicians were employed, and that every other circumſtance were in proportion, yet the crouds, by corrupting the air, would render moſt of the care ineffectual. This may eaſily be conceived from what has really happened; for paſſing over the peſtilential mortality in the hoſpitals of the firſt campaign, and taking the reſt ſince at a medium, there has been commonly ſuch a degree of bad air in them, as to render the practice but little ſucceſsful; inſomuch, that upon the moſt favourable computation, I have not found that fewer than one in ten died of all that were admitted. Beſides the better chance for good air, there is a farther advantage accruing from regimental hoſpitals, which is, that the ſeveral ſurgeons are beſt acquainted with the conſtitution and diſpoſition of their patients, as well as with all the circumſtances of their diſtempers. And as the phyſician is ſtill to be reſorted to in any caſe of difficulty, or is to make regular viſits, there can be no objection made to this method of treating the ſick, which, as often as it has been tried, I have obſerved to have been more ſucceſsful than that of one large and general hoſpital. To enable the ſurgeons the better to attend thoſe of their own regiments, it would be proper in time of war to give each an additional mate, as it muſt often happen that the ſick will be too numerous to be well taken

care of by himſelf and one mate only: beſides, in ſickly times, one of them may fall ill, or poſſibly both at once.

We ſhall next conſider the general hoſpitals which are of two kinds, *viz.* the flying hoſpital attending the camp at ſome convenient diſtance, and the ſtationary hoſpital which is fixed to a place. In the choice of both, thoſe who have the direction ſhould take care that the wards be as large and airy as poſſible, remembering that warmth is not wanting in ſummer, and that in winter it is chiefly to be procured by fires. It would alſo be better to have the general hoſpitals in towns than in villages, as the former will furniſh larger wards, beſides other conveniencies.

As to the diſpoſition of hoſpitals, with regard to preſerving the purity of the air, the beſt rule is, to admit ſo few patients into each ward, that a perſon unacquainted with the danger of bad air, might imagine there was room to take in double or triple the number. It will alſo be found a good expedient, when the cielings are low, to remove ſome part of them, and to open the garret ſtory to the tiles. It is ſurprizing in how few days the air will be corrupted in cloſe and crouded wards, and what makes it hard to remedy the evil, is the difficulty of convincing either the nurſes or the ſick themſelves, of the neceſſity of opening the doors or windows at any time for air. I have generally found thoſe wards the moſt healthful, when, by

broken windows and other wants of repair, the air could not be excluded.

It is therefore probable, that when fire-places are wanting, a preſervative would be found in the uſe of the late reverend Dr. *Hale*'s ventilators, whereof ſome might be made for the hoſpitals ſmall enough to be eaſily carried about. By ſuch an invention we might hope for a conſiderable purification of the air in every ward; and the working them might be a good exerciſe for the convaleſcents. As theſe ventilators muſt be of a ſmaller ſize, for the convenience of carriage, the ſame might be likewiſe uſed on board the tranſport ſhips *.

In winter-hoſpitals, chimneys only ſhould be uſed, and ſtoves never; for, though the latter may warm a large ward

* I was favoured with the following paper of directions from the celebrated inventor, whom I conſulted on this occaſion, but his method was never put in practice.

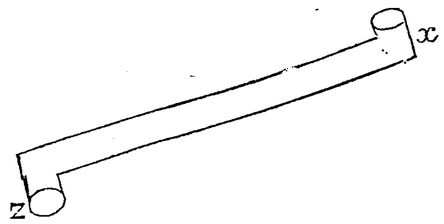
Some conſiderations about means to draw the foul air out of the ſick rooms of occaſional army-hoſpitals, in private houſes in towns.

As it ſeems improper to draw the air out of theſe rooms, by ſmall moveable ventilators placed in the paſſages between the rooms, becauſe the foul air that is drawn out will ſoon return from thoſe paſſages into the ſick rooms; ſo the moſt likely means that occur to me for doing it, is to have a board ſcrewed faſt, and not nailed, becauſe of the noiſe, to the upper part of a window on the outſide of each room. This board is to have a round hole in it, and alſo the glaſs oppoſite to it, of a ſize to receive a trunk of a ſufficient length to reach from the window to a ſmall ventilator on the ground through which the foul air is to be drawn out of each room, the freſh air entering in at the door: this is to be repeated as often in a day as ſhall be thought proper.

ward better and at leſs expence, yet by making ſcarce any draught of air they will be apt to promote its putrefaction, whereas a fire kept up in a chimney acts like a conſtant ventilator.

If ventilators are uſed, other precautions will be the leſs neceſſary; but if they are not, we muſt have recourſe to ſuch other means as may help to purify the air. Among theſe, the moſt common is burning frankincenſe, the wood or berries of juniper, or ſome other reſinous or antiſeptic vegetable. The ſteams of vinegar are often recommended on theſe occaſions, and probably would beſt

It will be requiſite to have the holes both in the board fixed over the window, and in the ſide of the ventilator made round to receive the correſponding round orifices of the trunks; by which means the ſame trunk may ſerve for windows of different heights, by being placed more or leſs obliquely, thus: viz. *x, the end at the window; z, the end fixed to the ventilator.*



There may be trunks of different lengths, and made to join into each other, for the higher windows. As theſe trunks are to be made of thin fir-boards, about five inches broad, they need not be nailed together in the form of a trunk till they are to be uſed, and may therefore lie in a ſmall compaſs.

A very ſmall ventilator will be ſufficient for this purpoſe: viz. *about five feet long, and twenty inches wide and deep, ſuch as is deſcribed in my ventilator book, fig.* 6.

anſwer

anſwer the purpoſe; but being not ſo commodiouſly diffuſed as other things that burn, they have hitherto been leſs uſed. The burning of ſulphur, or gun-powder, is alſo mentioned by authors as proper in ſuch caſes; and from the acidity of their ſteams they ſeem likely to ſucceed.

§ 4.

How to prevent diſeaſes ariſing from improper diet.

IT is to be obſerved, that no orders will be able to reſtrain ſoldiers from eating and drinking what they like, if they have money to purchaſe it. Therefore a fundamental rule, and indeed almoſt the only one needful, is to oblige the men to eat in meſſes; by which means, we may be aſſured that the beſt part of their pay will be beſtowed on wholeſome food, in as much as what is agreeable to the majority has the beſt chance for anſwering that character. And it will be ſufficient to leave the choice to their taſte and experience, without ſearching too ſcrupulouſly into the nature of particular aliments, which even with more delicate people ſeldom offend ſo much in kind as in quantity. The greateſt impediments to meſſing, are the wives and children, who muſt often be maintained on the pay of the men: in ſuch circumſtances, it is not improper food, but the want of it, that may endanger a ſoldier's health. This method being eſtabliſhed, it

it only remains to take care that the men be ſupplied with good bread; and that the markets be ſo regulated that the traders have encouragement to come to the camp, and the meſſes have good proviſions at a moderate price, vegetables in particular, which during the hot weather ought to make a great part of the diet. Though the pay of a *Britiſh* ſoldier is better than that of other troops abroad, yet his oeconomy is leſs; ſo that after giving in his proportion to the meſs, there is little danger of his having wherewithal to make a debauch. How far ſome quantity of ſtrong liquors is uſeful, has been already ſhewn *.

As the heats of ſummer tend to produce diſeaſes in autumn, by diſpoſing the humours to corruption, it were to be wiſhed that during the hot ſeaſon the diet was ſo ordered that this tendency might in ſome meaſure be corrected. It may deſerve our notice, that the *Romans* conſidered vinegar as one of the moſt neceſſary proviſions of an army †. Now, whether this was only uſed by way of ſeaſoning to their victuals, or mixed with water and drunk whilſt they were hot or feveriſh, it muſt have had a good effect in correcting the too great putreſcency of the blood during the ſummer. Vinegar-whey,

* Part ii. chap. ii. § 4.

† Hyeme lignorum et pabuli, æſtate aquarum vitanda eſt difficultas. Frumenti vero, vini, *aceti*, nec non etiam ſalis omni tempore vitanda neceſſitas. VEGET. De Re Milit. lib. iii. cap. iii.

already

already known in the hoſpital, is a cooling medicine in inflammatory fevers, and was liked by the patients. But the ſureſt way of making ſoldiers take vinegar or any other acid, by way of preſervative, is by mixing it with ſuch a proportion of ſpirits as may be thought a proper quantity for each man; and eſpecially when troops are ſent into *Zealand*, or the more marſhy parts of *Brabant* or *Flanders*, during the ſickly ſeaſon in thoſe countries.

Pork has ſometimes been forbid in camps, being looked upon as unwholeſome. *Sanctorius* obſerves that it checks perſpiration; and as it corrupts ſooner than beef or mutton, it may be preſumed to afford a leſs proper nouriſhment than either, when there is danger from putrefaction. It is alſo believed, that in camps, the meat in general is too little bled, and thereby becoming ſooner tainted, concurs with other cauſes in breeding putrid diſeaſes.

In eſtabliſhing the meſſes, ſome regulations might be made with regard to an allowance of ſpirits, whether by ſtoppages on the pay, or otherwiſe. This is already practiſed in the navy, and probably for the ſame reaſon for which it might ſometimes be proper here; ſince, in ſhips, men are alſo liable to diſtempers ariſing from moiſt and corrupted air.

The officers, whether in camp, or in cantonments in a moiſt country, are expoſed, though in a leſs degree than the

the common men, to the ſame diſeaſes of the ſeaſon and climate. Their chief rule in diet, in ſickly times, is to eat moderately, avoiding ſurfeits and indigeſtion *. Wine is neceſſary; but exceſs in every thing is at this time dangerous. I ſhall conclude with that prudent rule of *Celſus* for preſerving men againſt diſtempers ariſing from a moiſt and corrupted ſtate of the air: *Tum vitare oportet fatigationem, cruditatem, frigus, calorem, libidinem* †.

§ 5.

How to prevent diſeaſes ariſing from errors in exerciſe.

THE greateſt fatigue which a ſoldier undergoes is in making long marches, eſpecially in hot or rainy weather. When the ſervice requires it, ſuch hardſhips muſt be endured; but they will be attended with leſs ſickneſs, if care be taken to ſupply good proviſions and plenty of dry ſtraw. At other times, when diſpatch is not required, ſhort marches before the heat of the day, with proper halts, are ſo far from haraſſing the troops, that nothing can be more conducive to preſerve their health. In fixed camps, as there is always more ſickneſs from inactivity than from fatigue, it would be neceſſary to make proper regulations about the exerciſe at ſuch times; and the

* Si qua intemperantia ſubeſt, tutior eſt in potione quàm in eſcâ. CELSUS De Med. lib. i. cap. ii.

† Lib. i. cap. x.

rather, as our ſoldiers left to themſelves are naturally too indolent to uſe what is proper for them.

The exerciſe of a ſoldier may be conſidered under three heads; the firſt relates to his duty; the ſecond, to his living more commodiouſly; and the third, to his diverſions.

The firſt, conſiſting chiefly in the exerciſe of his arms, will be no leſs the means of preſerving his health than of making him expert in his duty *; and frequent returns of this, early and before the ſun grows hot, will be more advantageous than repeating it ſeldom, and ſtaying too long out at a time: for, a camp affording little convenience for refreſhment, all unneceſſary fatigue is to be avoided.

As to the ſecond article, cutting boughs for ſhading their tents, making trenches around them for carrying off the water, airing the ſtraw, cleaning their clothes and accoutrements, and aſſiſting in the buſineſs of the meſs, are all things which, as they muſt be ſtrictly executed by orders, ought to be no diſagreeable exerciſe to the men for ſome part of the day.

* Rei militaris periti, plus quotidiana armorum exercitia ad ſanitatem militum putaverunt prodeſſe, quam medicos. — ex quo intelligitur quanto ſtudioſiùs armorum artem docendus ſit ſemper exercitus, cum ei laboris conſuetudo et in caſtris ſanitatem, et in conflictu poſſit præſtare victoriam. VEGET. De Re Milit. lib. iii. *cap.* ii.

Laſtly,

Laſtly, as to diverſions, ſince nothing of that ſort can be enforced by orders, the men muſt be encouraged to them, either by the example of their officers, or by ſmall premiums to thoſe who ſhall excel in any kind of ſports, which ſhall be judged moſt proper for anſwering this purpoſe. But herein ſome caution is neceſſary with regard to exceſs, becauſe our common people generally obſerve no medium between their love of eaſe and purſuing the moſt violent exerciſe. And however neceſſary motion may be to troops in fixed camps, we are to beware, on the other hand, of giving them too much fatigue, eſpecially in hot weather, and in times of ſickneſs; and above all, of expoſing them to wet clothes, which, as has been fully ſet forth, is one of the moſt frequent cauſes of camp-diſeaſes.

CHAP. IV.

The ſeaſons compared, with regard to the health of an army.

IN the beginning of every campaign we are to expect, for the firſt month at leaſt, that the *returns* will be conſiderably higher than if the men had remained in quarters. The earlieſt encampment began on the 8th of April *, and produced ſuch a number of ſick, that in a month's time the *returns* amounted to $\frac{1}{27}$th part of the whole. In the year 1745, the campaign was opened on the 25th of April; and in 1747, on the 23d of the ſame month; both

* Part i. chap. viii.

in the *Low-Countries:* but in the year 1746, the troops encamped on the 23d of April, in the north of *Scotland*; which, conſidering the latitude, may be reckoned of all the earlieſt campaign during the war. And from all theſe inſtances there is reaſon to believe, that the firſt proportion mentioned will generally hold, when the army takes the field, in *Flanders*, in the firſt or ſecond week of April.

But if the troops were to continue in quarters till the middle of May, the ſickneſs of the firſt month would be conſiderably leſs, though perhaps not ſo much as might be expected. Thus, in the firſt campaign, the *Britiſh* encamping on the 17th of May *, had in the hoſpital, after the firſt month, about $\frac{1}{32}$ part of the whole number; a proportion, however, which we cannot offer as a general one, becauſe the men had then made a long march, and it was their firſt campaign. The next year, when the troops marched out on the 13th of May, after a month's encampment, there was found in the hoſpitals about $\frac{5}{40}$th part only; but as the weather was then mild, and other circumſtances favourable, the proportion may perhaps be reduced in common years to $\frac{1}{30}$th: ſo that, *cæteris paribus*, the number of the ſick will be after the firſt month about $\frac{1}{4}$th greater when the army encamps in the middle of April, than when it takes the field a month later.

After the firſt fortnight or three weeks of the encampment, the ſickneſs daily decreaſes, as the moſt infirm are already

* Part i. chap. iii.

already in the hoſpital, the reſt more hardened, and as the weather is growing daily warmer. This healthy ſtate continues throughout the ſummer *, unleſs by ſome extraordinary expoſition to rain, the men get wet clothes, or lie wet; in which caſe, in proportion to the preceding heats, the dyſentery will be more or leſs frequent.

The great ſickneſs commonly begins about the middle or end of Auguſt, whilſt the days are ſtill hot, but the nights cool and damp, with fogs and dews; then, if not ſooner, the dyſentery prevails, and though its violence is ended by the beginning of October, yet the remitting fever gaining ground continues throughout the reſt of the campaign, and never intirely ceaſes, even in quarters, till the froſts begin.

The ſickneſs in the beginning of the campaign is ſo uniform, that the number may be nearly predicted; but for the reſt of the ſeaſon, as the diſeaſes are then of a contagious nature, and depend ſo much upon the heats of the ſummer, we cannot well foreſee how many may fall ſick from the beginning to the end of autumn. At the end of the campaign in *Germany*, the number in the hoſpitals was to the men in health as 3 to 13. In 1747, when the troops left the field, the ſick made about $\frac{1}{3}$th part of the whole number: but if we conſider by itſelf the detachment ſent that year into *Zealand*, this proportion was juſt

* That is, until the middle of Auguſt.

juſt inverted; for the men in health were to the diſeaſed, only as 1 to 4. Upon cloſing the campaign in 1744, though half of the army were new men, we had but 1 in 17 ſick; and in the year following, which was remarkable for health, there was not above 1 in 26 ill: but in both theſe years the troops returned into winter-quarters ſooner than uſual.

I have obſerved, that the laſt fortnight of a campaign, if continued till the beginning of November, is attended with more ſickneſs than the firſt two months of the encampment. If campaigns are therefore to laſt ſix months, it imports much as to health, whether they begin early, or late. For though it may be thought ſafer for troops to delay encamping till the beginning of May, and to ſtay out till the end of October, yet experience ſhews it is better to go out a fortnight ſooner, in order to return ſo much the earlier into winter-quarters.

We have already obſerved, that the remitting fever does not always terminate with the campaign, but continues in quarters till the froſts begin; and that there are no other acute diſtempers, excepting ſuch as are occaſioned by great colds *, from that period till the next encampment. But of chronic diſeaſes, ſince the autumn has laid ſo large a foundation for them, a variety will always

* Part ii. chap. i. and ii.

occur,

occur, and thoſe generally ariſing from obſtructed *viſcera*. Yet upon the whole, the *returns* of the ſick will ſo much decreaſe, that if the troops are but tolerably accommodated, and the foregoing autumn has not been unuſually bad, they will probably next ſpring take the field without leaving above one man in 40 behind.

Winter-expeditions, though ſevere in appearance, are attended with little ſickneſs, if the men have good ſhoes, quarters, fuel, and proviſions. Of this, we had one proof in the march into *Germany*; and another, in that to the North in the year of the rebellion. But long marches in ſummer are not without danger, unleſs they are made in the night, or ſo early in the morning as to be finiſhed before the heat of the day.

Thoſe who fall ill in the camp (eſpecially in the decline of ſummer) ſo as to be confined for ſome time to the hoſpital, are during that ſeaſon not to be relied upon for ſervice; for being weakened by their ſickneſs and lying warm while under cure, they will be liable to relapſe as ſoon as they return to the field. It would therefore be proper to employ the convaleſcents in garriſons for the remainder of the campaign, or at leaſt till they have full time to recover; for which end hoſpitals have neither accommodation nor air. It would alſo tend much to prevent diſeaſes, if the ſickly, or unſeaſoned corps, were

ſent

ſent a fortnight earlier than the reſt into winter-quarters, whenever that is conſiſtent with the ſervice.

Having mentioned the ſeaſoning of troops, it may be proper to add the following caution, as a miſtake here may be made ſo eaſily. By well-ſeaſoned troops are commonly underſtood, ſuch as having gone through much fatigue are therefore ſuppoſed beſt qualified to bear more. But in this we may be deceived; becauſe ſuch corps as have been rendered ſickly by ſervice, will never afterwards be ſtrong, or fit for new labour, till all the infirm are dead or diſmiſſed. For, as ſoldiers in time of war are not only ſubject to violent diſorders, but have little time or convenience for recovery, if once they fall ill, it is odds but their conſtitution will be ſo weakened, as to make them ever after more liable to diſeaſes. I ſhall mention two inſtances. In the year before the war our troops having encamped on *Lexden-heath* near *Colcheſter*, and ſtaid out late, returned ſickly into quarters. Now, it was obſervable, that thoſe who recovered and went over to *Flanders* were the firſt ſick in the garriſons; and that the ſame men, with others who were taken ill in the *Low-Countries*, were alſo moſt ſickly in the cantonments, and afterwards in the camps in *Germany*. So that theſe corps were never healthy till they loſt all their weak men; which indeed in a great meaſure happened during the courſe of the firſt campaign. The ſecond inſtance is of thoſe detachments

ments in *Zealand*, and at *Bergen-op-Zoom*, which ſuffering greatly by the bad air of the country, the ſame battalions, in the beginning of the next campaign, were remarkably more ſickly than any of the reſt *. But as the firſt campaign in *Flanders* (though ſucceeding the ſickly one in *Germany*) was healthful †, and as the next was ſtill more ſo ‡, ſome may thence infer that troops are only liable to ſuffer in the firſt year, and being then ſeaſoned will afterwards undergo the uſual military fatigues unhurt. But, beſides that the weather was very favourable during the ſecond and third campaigns, and that the camp broke up early in both, it muſt be remembered, that all the corps which had been in *Germany* had loſt almoſt all their ſickly men there; ſo that thoſe who took the field in the next year were either old ſoldiers, who had never been ill, or recruits, *additionals*, or regiments which had come freſh from *England:* theſe therefore holding out well, were rather a proof of what is advanced above. And if the third campaign was ſtill more healthful than the ſecond, it is to be obſerved, that the army happened then to be in its beſt ſtate; conſiſting chiefly of freſh ſoldiers, or of men who never had been ill, or of thoſe who were properly ſeaſoned by having made a ſhort campaign in moderate weather. But as a clear proof that the health and hardineſs of troops is not to be meaſured by

* Part i. chap. vii. and viii. † Part i. chap. iv. ‡ Chap. v.

the time they have ſerved, in the two laſt years of the war, the ſick were in proportion as numerous as they had been in the two firſt: and what happened in the cantonments in *Dutch-Brabant*, during the laſt campaign, ſhews that no ſeaſoning can avail againſt the influence of the moiſt and corrupted air of marſhes.

The whole amounts to this. Conſidering all the hardſhips, and expoſitions to colds attending the eaſieſt ſervice, thoſe troops will be beſt ſeaſoned to undergo the fatigues of a ſecond campaign, whoſe conſtitution has been leaſt weakened in the firſt.

OBSER-

OBSERVATIONS ON THE DISEASES OF THE ARMY.

PART III.

CHAP. I.

Obſervations on colds, and inflammatory fevers in general.

HAVING laid down the diviſion of the diſeaſes moſt incident to an army, with the remoter cauſes and means of prevention, I ſhall proceed in this part to offer ſome practical obſervations upon each diſtemper, in the order in which they were propoſed*; and therefore ſhall begin with ſuch as depend upon inflammation only.

But as inflammatory diſorders are every where common, and are treated by ſo many authors, I ſhall not enter in-

* Part ii. chap. i.