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THE INFLUENCE OF TROPICAL CLIMATES ON EUROPEAN CONSTITUTIONS.

TO WHICH IS ADDED

Tropical Hygiene;

OR THE

PRESERVATION OF HEALTH

IN

ALL HOT CLIMATES,

(Adapted to General Perusal.)

By JAMES JOHNSON, M.D.

Author of "The Influence of the Atmosphere on the Health and Functions of the Human Frame," and Editor of the MEDICAL REGISTER; or Quarterly Journal of Medical and Surgical Science."

SECOND EDITION, GREATLY ENLARGED.

Haud ignarus mali miseris succurrere disco. VIRG.

——————— Study well the clime,
Mould to its manners your obsequious frame
And mitigate those ills you cannot shun. ARMSTRONG.

LONDON:

SOLD BY T. AND G. UNDERWOOD, AND HIGHLEY AND SON, FLEET-STREET; CALLOW, CROWN COURT, SOHO; COX AND SON, BOROUGH; AND ALL OTHER BOOKSELLERS.

PRINTED FOR THE AUTHOR, BY MOTTLEY AND HARRISON, PORTSMOUTH.

1818.

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TO

JOHN WEIR, M.D.

Naval Medical Commmissioner, &c.

ANDREW BAIRD, M.D.

Inspector of Naval Hospitals, &c.;

D. J. H. DICKSON, M.D. F.L.S. &c.

Physician to the Fleet;

JOHN GRAY, M.D.

Late Physician of Haslar Hospital;

DUNCAN Mc. ARTHUR, M.D.

Late Physician of the Royal Hospital, Deal, &c.;

WILLIAM BURNETT, M.D.

Physician to the Fleet, &c;

ARCHIBALD ROBERTSON, M.D.

Fellow of the Royal Medical Society of Edinburgh, &c.

AND TO ALL HIS

NAVAL MEDICAL BRETHREN,

WHO HAVE

DISTINGUISHED THEMSELVES

BY

NATIVE TALENT, PROFESSIONAL ZEAL,

OR

SCIENTIFIC ACQUIREMENTS,

THIS

SPECIMEN

OF

Naval Medical Literature,

IS RESPECTFULLY DEDICATED

BY THEIR

SINCERE FRIEND AND BROTHER OFFICER,

The AUTHOR.

Portsmouth, 1818.

PREFACE.

A VERY large impression of this Work having been distributed, and the demand still increasing, the Author has, for a considerable time past, employed his leisure hours in preparing a new Edition that might be yet more worthy of public patronage than the preceding. He has here endeavoured to combine every thing that is really and practically useful to the Tropical visitor or sojourner, in one volume, which, by means of small type and concentrated style, contains nearly *double* the quantum of matter in the first Edition, while it has not been sensibly increased in price or size. The labour, first and last, has been enormous; but he hopes not unprofitable. A new feature has been added to this Edition—the consideration of *tropicoid* climates, or those bordering on the tropics, the diseases of which, at particular periods, resemble and elucidate those of equatorial regions. For this plan he quotes the authority of his celebrated predecessor Lind, who has taken a still wider range than the present work embraces. The Author is convinced that this is a most essential requisite in every treatise on the diseases of the Torrid Zone. These diseases acknowledge no cancer or capricorn boundaries. The *same class* sallies occasionally from La Plata to the Scheldt. It will sweep along the banks of the Ganges, the Euphrates, the Nile, the

Tiber, the Guadalquiver, the Chesapeake, the Mississippi, the Oronoco, and around every sinuosity of the great Western Archipelago. He then who studies the influence of Tropical Climates on European Constitutions, *by parallels of latitude*, will do so inefficiently. It is like studying the physiology of the stomach or liver, without taking into consideration the functions of surrounding viscera. An appeal may be made to the *parallel* between the valley of Egypt and the coast of Coromandel for the truth of this remark. It will there be seen that the climate and diseases of the one elucidate those of the other, and that the *parallel* has solved a problem in Etiology which has hitherto proved a stumbling block to Physicians—namely the question of an indigenous poison existing in India, and occasioning the prevalence of Hepatitis there.

The Author has, in this Edition, aimed at being both comprehensive and minute, in every thing relating to tropical diseases, and to tropical Hygiene. How far he may have succeeded, must be left to time, and the adjudication of the public voice.

St. George's-square, Portsea, 1818.

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No 1 Albany Piccadilly London

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THE

Influence of Tropical Climates

ON

European Constitutions.

I BELIEVE it is a general opinion among Philosophers, that the Constitution of Man is better adapted to bear those changes of temperature, &c. experienced in migrating from a Northern to a tropical region, and vice versa, than that of any other animal. They proudly observe, that this power of accommodating itself to all climates, is a distinctive characteristic of the human species, since no other animal can endure transplantation with equal impunity. But, I think it would not be difficult to shew, that for this boasted prerogative, man is more indebted to the ingenuity of his mind, than to the pliability of his body.

To me, indeed, it appears, that he and other animals start on very unequal terms, in their emigrations. Man, by the exertion of his mental faculties, can raise up a thousand barriers round him, to obviate the deleterious effects of climate on his constitution; while the poor animal, tied down by instinct to a few simple modes of life, is quite defenceless. Nature must do all for the latter; and, in fact, it is evident that this indulgent mother does compensate, in some degree, for the want of reason, by producing such corporeal changes, as are necessary for the animal's subsistence under a foreign sky, in a *shorter* space of time, than is necessary for effecting correspondent changes in man. One example may suffice. The tender and innocent sheep, when transported from the inclemency of the north, to pant under a vertical sun on the equator will, in a few generations, exchange its warm fleece of *wool* for a much more convenient coat, of *hair*. "Can the Ethiopian change his hue," in the same period, by shifting

his habitation from the interior of Africa to the shores of the Baltic? Or will it be said, that the fair complexion of Europeans, may, in two or three generations, acquire the sable tinct of the inter-tropical natives, by exchanging situations? Assuredly not. Where then is the superior pliancy of the human constitution? The truth is, that the tender frame of man is incapable of sustaining that degree of exposure to the whole range of causes and effects incident to, or arising from vicissitude of climate, which so speedily operates a change in the structure, or, at least, the exterior, of unprotected animals.

But it is observed, that of those animals translated from a temperate to a torrid zone, "many die suddenly, others droop, and all degenerate." This is not to be wondered at, considering the disadvantages under which they labour. Man would not fare better, if placed in similar circumstances. Even as it is, the parallel is not far from applying. Of those Europeans who arrive on the banks of the Ganges, many fall early victims to the climate, as will be shewn hereafter. That others droop, and are forced, in a very few years, to seek their native air, is also well known. And, that the successors of all would *gradually degenerate*, if they remained permanently in the country, cannot easily be disproved; while a very striking instance, corroborative of the supposition, may be here adduced.

Whoever has attentively examined the posterity of De Gama, and Albuquerque, now scattered over the coast of Malabar, the plains of Bengal, and the Island of Macao, once the theatres of Lusitanian pre-eminence, will be tempted to exclaim:—

'Twas not the sires of such as these,
Who dared the elements and pathless seas;
Who made proud Asian monarchs feel
How weak their gold was against Europe's steel.
But beings of *another mould*,—
Rough, hardy, vigorous, manly, bold!

In answer to this, it will be alleged, "that they have married and blended with the natives until all shade of distinction is obliterated." But it is well known to those who have resided long in India, that the two great prevailing classes of society in that country, the Hindoos and Mahomedans, hold these descendants of the Portuguese in the most marked and sovereign contempt; while the latter, still retaining a remnant of

the religion, and all the prejudice of their progenitors, entertain an equal abhorrence of their idolatrous and infidel neighbours. This being the case, we may fairly presume, that the intermixture has been much less extensive than is generally supposed; an inference strongly supported, if not confirmed, by the well-known fact, that, while the people in question have forfeited all pretensions to the European *complexion*, their more stubborn *features* still evince a descent, and establish their claim to an ancestry, of which they are superlatively proud. Let those who deny *one common origin* of mankind, and that climate is the *sole* cause of complexion, explain this phenomenon if they can.

On the other hand, if we look at inter-tropical natives approaching our own latitudes, the picture is not more cheering. The African children brought over by the Sierra Leone Company for education, seldom survived the third year in this country. "They bear the first winter, (says Dr. Pear-" son) tolerably well, but droop during the second, and the " third generally proves fatal to them."

The object of these remarks, which, at first sight might seem irrelevant, will now appear.—Since it is evident that nature does not operate more powerfully in counteracting the ill effects of climate on man, than on other animals, it follows that we should not implicitly confide, as too many do, in the spontaneous efforts of the constitution, but on the contrary, call in to its aid, those artificial means of prevention and melioration, which reason may dictate and experience confirm. In short, that we should, as my motto expresses it:—

——————" Study well the clime,
" Mould to its manners our obsequious frames,
" And mitigate those ills we cannot shun."—

That these salutary precautions are too often despised or neglected, a single quotation from a Gentleman, who has resided more than twenty years in India, and whose talent for observation is, in my opinion, unequalled, will put beyond a doubt. " Nothing can be more preposterous (says Capt. " Williamson*), than the significant sneers of Gentlemen on " their first arrival in India; meaning thereby to ridicule, or " to despise what they consider effeminacy or luxury. Thus " several may be seen walking about without chattahs (i. e.

* Author of " Oriental Field Sports," " East India Vade Mecum." &c.

" umbrellas) during the greatest heats. They affect to be " ashamed of requiring aid, and endeavour to uphold, by " such a display of indifference, the great reliance placed on " *strength of constitution*. This unhappy infatuation rarely " exceeds a few days: at the end of that time, we are too " often called upon to attend the funeral of the self-deluded " victim.†"

It shall be my endeavour in this essay, after tracing the causes, and portraying the effects of tropical diseases, in such a manner as must impress the most heedless European with the necessity of circumspection on approaching the scene of danger, to furnish a code of instructions deduced from principle and experience, that cannot fail to prove a useful companion to every one who regards health as the grand source of happiness, and the most invaluable blessing which heaven can bestow. Many a day's anxiety and personal suffering should I have escaped, had I been furnished with so friendly a monitor!

Without any very fastidious regard to arrangement, it will still be necessary, for the sake of perspicuity, to observe some order. I shall therefore divide the subject into three principal heads, viz:—

1.—The Primary or General Effects of a Tropical Climate on the European Constitution.

2.—The Specific or Actual Diseases.

3.—Prophylaxis; or the Means of Counteracting the Influence of Climate, and Preserving Health.

---

† East India Vade Mecum, vol. 2. page ii.

PART I.

PRIMARY OR GENERAL EFFECTS.

UNDER this head, I shall consider some of those gradual and progressive changes in the constitution, and deviations from previous health and habits, which, though pre-disposing, and verging, as it were, towards, yet fall short of actual disease.

These are consequences which all must expect, more or less, to feel, on leaving their native soil, and, of course, in which all are directly interested. For although a few individuals may occasionally return from even a long residence in hot climates, without having suffered any violent illness, or much deterioration of constitution; yet the great mass of Europeans will certainly experience the effects developed under this head, and many others of minor consequence, which will be taken notice of in different parts of the work.

It is, however, by the most scrupulous attention to these *incipient deviations from health*, by early arresting their growth, or at least retarding, as much as possible, their progress, that we can at all expect to evade those dangerous diseases, to which they inevitably, though often imperceptibly, tend.

Sec. 1.—The transition from a climate, whose medium heat is 52°. of Fahrenheit, to one where the thermometer ranges from 80°. to 100°. and sometimes higher, might be supposed, a priori, to occasion the most serious consequences. Indeed, the celebrated Boerhaave, from some experiments on animals, concluded, that the *blood would coagulate in our veins*, at a temperature very little exceeding 100°. More modern trials, however, have proved that the human frame can bear, for a short time at least, more than double the above degree of atmospherical heat, and that too without greatly increasing the natural temperature of the body.

The benevolent author of our existence has endowed man, as well as other animals, with the power, not only of generating heat, and preserving their temperature, in the coldest regions of the earth; but has also provided an apparatus for

carrying off any super-abundance of it that might accumulate where the temperature of the atmosphere approaches to or exceeds that of the body. With the *former* process, which is supposed to be carried on in the lungs, we have, at present, nothing to do; the *latter* is one which deserves great attention, and which will meet with ample consideration in various parts of this essay.

We are no sooner beneath a vertical sun, than we begin, as may naturally be supposed, to experience the disagreeable sensation of unaccustomed warmth; and as the temperature of the atmosphere, even in the shade, now advances within ten or twelve degrees to that of the blood, and in the sun, very generally exceeds it, the heat, perpetually generated in the body, cannot be so rapidly abstracted, as hitherto, by the surrounding air, and would, of course, soon accumulate so as to destroy the functions of life itself, did not Nature immediately open the sluices of the skin, and by a flow of *perspiration*, reduce the temperature of the body to its original standard.

Whether the super-abundant animal heat combines with the perspirable fluid, and thus escapes; or whether the refrigeration takes place on the principle of evaporation, is more a matter of speculation than practical importance to ascertain. We know the fact, that perspiration is a cooling process. The modus operandi—

"Let sages versed in Nature's lore explain."

When we contemplate this admirable provision of nature, against what might appear to us an unforeseen event;—when we survey the resources and expedients which she can command on all emergencies—her power of supplying every waste, and restraining every aberration of the constitution, we would be almost tempted to conclude, that man was calculated for immortality! But, alas!

——————"There is a point,
"By Nature fixed, whence life must downward tend,"

'Till at length, this wonderful machine, exhausted by its own efforts at preservation, and deserted by its immaterial tenant, sinks, and is resolved into its constituent elements!

Nascentes morimur, finisque ab origine pendet.

But, to return. We must not conclude that this refrigerating process, adopted by nature to prevent more serious mischief, is, in itself, unproductive of any detriment to the constitution—far otherwise. "If (says Dr. Currie) the orifices do *not* pour out a proportionate quantity of perspiration, disease must ensue from the direct stimulus of heat; and if the *necessary* quantity of perspiration takes place, the system is *enfeebled* by the evacuation*."

Here, then, we have Scylla on one side, and Charybdis on the other :—morbid accumulation of heat if we do not perspire enough—debility if we do. How are we to direct our course through this intricate and dangerous navigation?

Dr. Currie.

"Europeans who go to the West Indies are more healthy, in proportion, as they perspire freely, especially if they support the discharge by a moderate use of *gently stimulating liquids, stopping short of intoxication.*"—ib.

Dr. Moseley.

"I aver from my own knowledge and custom, as well as from the custom and observations of others, that those who drink *nothing but water*, are but little affected by the climate, and can undergo the greatest fatigue without inconvenience."—*Tropical Diseases, p. 57.*

Who shall decide when Doctors disagree?

Without meaning to set up the judgment of a Moseley in competition with that of a Currie, on other subjects, candour obliges me to confirm, by personal observation and experience, the truth of Dr. Moseley's remark. Dr. Currie never was in a tropical climate, therefore had the above piece of information from others; and it is one of the very few erroneous positions in his invaluable work. Nevertheless, these apparently opposite directions, are not so contradictory in *fact* as in *terms*. The principle on which both act is the same, though the means are different. Dr. Currie's plan of supplying the stomach with "gently stimulating liquids," will undoubtedly keep the morbid heat from accumulating, by driving out a copious perspiration; but it will, at the same time, lead to debility, by carrying off much more of that fluid

* Medical Reports, vol. 1, p. 278.

than is necessary; by which means the thirst, instead of being allayed, will be increased; and what is still worse, the body will be rendered more susceptible of the subsequent impressions of cold, the deleterious effects of which, at these times, are much more extensive than is generally believed, as will be shewn in another part of the work.

Dr. Moseley's plan, on the other hand, far from preventing perspiration, will be found, in general, to promote it, but at the same time restrain its *excess*.—A familiar example or two will elucidate this subject.

We will suppose two Gentlemen to be sitting in a room, at Madras, or in Jamaica, just before the sea-breeze sets in, both complaining of thirst, their skin hot, and the temperature of their bodies 100°, or two degrees above the natural standard.

One of them, pursuant to Dr. Currie's instructions, applies to the sangaree bowl, or porter cup, and after a draught or two, brings out a copious perspiration, which soon reduces the temperature to 98°. It will not stop here, however, nor indeed will the Gentleman, according to the plan proposed; for instead of putting the bulb of the thermometer under his tongue, to see if the mercury is low enough, he, feeling his thirst increased by the perspiration, very naturally prefers a glass or two more of the sangaree—" to support the discharge"—still, however, " stopping short of intoxication." Now, by these means, the temperature is reduced to 97°. or 96½°, in which state, even the slight, and otherwise refreshing chill of the sea-breeze, checks more or less the cuticular discharge, and paves the way for future maladies.

Whether this is, or is not, a true representation of the case, let Dr. Currie's own words decide.

" If says he, ut supra, the necessary quantity of perspi-
" ration takes place, (viz. by the use of gently stimulating
" liquids,) the system is enfeebled by the evacuation, and the
" extreme vessels losing tone *continue* to transmit the per-
" spirable matter, *after* the heat is reduced to its natural
" standard, or, perhaps, *lower*; in which situation, we can
" easily suppose that even a *slight degree* of external cold
" may become dangerous."—Vol. 1. p. 278.

Let us now turn to the other Gentleman, who pursues a different line of conduct. Instead of the more palatable potation of sangaree, he takes a draught of plain cold water. This is hardly swallowed before the temperature of his body loses by abstraction alone, one degree, at least, of its heat.

It is now, we will suppose, at 99°. But the external surface of the body immediately sympathising with the internal surface of the stomach, relaxes, and a *mild* perspiration breaks out, which reduces the temperature to its natural standard, 98°. Farther, this simultaneous relaxation of the two surfaces, completely removes the disagreeable sensation of thirst; and, as the simple "antedeluvian beverage" does not possess many Circean charms for modern palates, there will not be the slightest danger of its being abused in quantity, or the perspiratory process carried beyond its salutary limits. Nor need we, on the other hand, apprehend its being neglected; since, from the moment that the skin begins to be constricted, or morbid heat to accumulate, the sympathising stomach and fauces will not fail to warn us of our danger, by craving the proper remedy. Taken therefore as a general rule, the advantages of the *latter* plan are numerous—the objections few. It possesses all the requisites of the *former*, in procuring a reduction of temperature, (the only legitimate object which the admirers of sangaree and copious perspiration can have in view) without any danger of bringing it below the proper level, or wasting the strength, by the profuseness of the discharge.

It is true, there is no general rule without exception; and there may be instances, wherein the use of "gently stimulating liquids" is preferable to that of cold drink.

For example:—during, or subsequent to violent exertion, under a powerful sun; or in any other situation in a tropical climate, when profuse perspiration is rapidly carrying off the animal heat, and especially when fatigue or exhaustion has taken place, or is impending—then cold drink would be dangerous, on the same principle as external cold. But these cases rarely happen through *necessity*, to Europeans, particularly in the East; and they will be duly considered in the prophylactic part of this essay.

I have been more prolix on this point, than may have seemed necessary to the medical reader; but considering that this is generally the first erroneous step which Europeans take, on entering the tropics, and that the function in question (perspiration) is more intimately connected with another very important one in the human frame, than is commonly supposed; I thought it proper to set them right, *in limine*. The probability of *future suffering* will rarely deter the European from indulging in *present gratifications;* but where these last, *i. e.* the stimulating liquids, are represented, from high authority, as not only innocent but salutary, it will require

some strength of argument to persuade young men to relinquish their use, or to check the wide-spreading evil.

Sect. 2.—In attempting to delineate the influence of hot climates on the European constitution, although we may endeavour—

"To chain the events in regular array;"

yet, it must be confessed, that nature spurns all such artificial arrangements; since simultaneous impressions on several organs, must produce co-temporary and combined effects, which our limited faculties are scarcely capable of embracing in thought, much less, of describing in the fetters of language.

Taking facts, however, and personal observation for landmarks, I shall pursue the investigation, as nearly as possible, in the order of nature and of events.

There exists between different, and often distant parts of the body, a certain connexion or relation, which, in medical language, is called "consent of parts:"—that is, when *one* is affected by particular impressions, the *other* sympathises, as it were, and takes on a kind of analogous action.

This sympathy, or consent of parts, has never been *satisfactorily* accounted for, by the ablest of our physiologists, nor—(mirabile dictu!) by the most ingenious of our theorists. As all, however, are agreed in respect to the *fact*, we may allow the *cause* to remain locked up in Nature's strong box, in company with many other arcana, which she does not seem disposed to reveal.*

Of these sympathies, none is more universally remarked, or familiarly known, than that which subsists between the *external* surface of the body, and the *internal* surface of the alimentary canal. This, indeed, seems less incomprehensible than many others, since the *latter* appears to be a continuation of the *former*, with the exception of the cuticle. In the first section, I gave an instance of the skin sympathising with the stomach, where the cold drink was applied to the latter organ. Had the water been applied to the external surface of the body, on the other hand, the stomach would have sympathised, and the thirst been assuaged.

The loss of tone, then, in the extreme vessels of the surface, in consequence of excessive, or long continued perspiration is, on this principle, necessarily accompanied, or soon

* I do not see that Dr. Park's laboured discussion on this subject, in the journal of Science, has brought us a whit nearer the knowledge of sympathetic action.

succeeded by a consentaneous loss of tone in the stomach, and fully accounts for that anorexia, or diminution of appetite, which we seldom fail to experience on entering the tropics, or, indeed, during hot weather in England. Now this, although but a link in the chain of effects, seems to me a most wise precaution of nature, to lower and adapt the irritable, plethoric European constitution, to a burning climate, by guarding very effectually against the dangerous consequences of repletion. This view of the subject will set in a clear light, the pernicious effects of stimulating liquids, operating on an organ already debilitated (probably for salutary purposes), and goading it thereby to exertions beyond its natural power, producing a temporary plethora, with a great increase of subsequent atony.

A remark, which every person of observation must have made, even in this country, during the summer, but particularly in equatorial regions, will farther elucidate this subject. If by walking, for instance, or any other bodily exercise, in the heat of the sun, during the forenoon, especially near dinner hour, the perspiration be much increased, and the extreme vessels relaxed, we find, on sitting down to table, our appetites entirely gone, until we take a glass of wine, or other stimulating fluid, to excite the energy of the stomach. Under such circumstances of artificial or forced relish for food, it is not to be wondered at, that the digestion should be incomplete, and that the intestines should suffer from the passage of badly-concocted aliment. Observation and personal feeling have taught me this,—that in hot climates, perhaps during hot weather in all climates, an hour's cool repose before dinner is highly salutary; and if on commencing our repast, we find we cannot eat without *drinking*, we may be assured that it is nature's caveat,—to beware of eating at all. This will be deemed hard doctrine by some, and visionary by others; but I know it is neither one nor the other: and those who shall neglect or despise it, may feel the bad consequences, when it is too late to repair the error.

There are several other causes, however, which operate in conjunction with the above, to impair the appetite:—one of which is, the want of rest at night. After disturbed and unrefreshing sleep, (but too common in tropical climates) the whole frame languishes next day, and the stomach participates in the general relaxation. The means of managing and obviating these effects, will be pointed out in the prophylactic part of this essay.

Sect 3.—We now take a wider range, and come to a subject more intricate in its nature, extensive in its bearings, and important in its consequences. It will readily be understood, that I allude to the influence of a tropical climate on the liver and its functions.

This immense gland is the largest organ in the human frame; for neither the brain, heart, spleen, nor kidnies, can be at all compared with it; and the lungs, though occupying a larger extent when inflated, yet if condensed to equal solidity, would fall short in size and weight.

Now, since nature, throughout her works, has seldom been accused of supererogation, we may safely conclude that the importance of this organ's function, in the animal economy, is commensurate with its magnitude. The structure of the liver has been explored by the anatomist, and the bile secreted in it, analysed. But, although the chymist has separated this fluid into its constituent parts; yet physiologists are not exactly agreed in regard to the purposes which it answers in the system. It is proved to be antiputrescent, and in conjunction with the pancreatic juice, it probably assists in animalising and eliminating the chyle from the chyme.

It is supposed not to enter the circulation naturally, at least in an unchanged state along with the chyle: but, there can be little doubt of its preventing the putrefactive or fermentative process from taking place in the excrementitious part, which is, ultimately, to be expelled the body. Another and a principal use of this important fluid appears to consist in stimulating the intestines into their peculiar peristaltic motion, and thus propelling their contents continually forward, to give the lacteals an opportunity of drinking up and conveying to the blood the nourishment by which our frames are supported.

In this point of view, it is the natural tonic of the intestines, and also the purgative which frees them from all fecal matter, the retention of which is productive of so much inconvenience, not to say disease.

The first effect of a tropical climate on the function of the liver, is universally allowed to be an *increase* of the biliary secretion. This is so evident in our own country, where the summer and autumn are distinguished by diseases arising from super-abundant secretion of bile, that it would be waste of time to adduce any arguments in proof of the assertion. But why an increase of the atmospherical temperature should so invariably augment the hepatic secretion in all climates,

and all classes of people, is totally unaccounted for. When Dr. Saunders conjectures that richness of blood, tenseness of fibre, grossness of diet, and rapidity of circulation, are the causes of Europeans being at first more afflicted with bilious redundancy in India than the native Hindoos, he gives us only a *comparative* view of things, and leaves us completely in the dark with respect to the *modus operandi* of heat, as a general and universal spur on the secretory vessels of the liver.

Were this a question of mere curiosity, or theoretical speculation, I should pass it by unnoticed; but from long and attentive observation, as well as mature reflection, I believe that I have discovered a connection between two important functions in the animal economy, which will let in some light on this subject, and lead to practical inferences of considerable importance.

The arguments and facts adduced in support of this connexion will be found under the heads Hepatitis, Dysentery, and in other parts of this essay. In the meanwhile, I shall merely state in a few words the *result* of my observations, leaving the reader to give credit to it, or not, as he may feel inclined.

There exists then between the extreme vessels of the vena portarum in the liver, and the extreme vessels on the surface of the body—in other words, between *biliary secretion and perspiration*, one of the strongest sympathies in the human frame; although entirely unnoticed hitherto, as far as I am acquainted. That these two functions are regularly, and to appearance, equally increased, or at least influenced by *one* particular agent (atmospherical heat) from the cradle to the grave,—from the pole to the equator, will be readily granted by every observer: and that this *synchronous action* alone, independent of any other original connection, should soon grow up into a powerful sympathy, manifesting itself when *either* of these functions, came under the influence of *other agents*, is a legitimate conclusion in theory, and what I hope to prove by a fair appeal to facts. This last consideration is the great practical one; for it is of little consequence whether this sympathy was originally implanted by the hand of nature at our first formation, or sprung up gradually in the manner alluded to, provided we know that it actually exists, and that by directing our operations towards any *one* of the functions in question, we can decisively influence the *other*. This is what I maintain; but here I only offer assertions; in a future part of the work I shall bring forward facts and

cogent arguments in proof of them. At present let this "consent of parts" between the skin and the liver, which I shall beg leave to denominate the "*Cutaneo-hepatic Sympathy*," account for the augmented secretion of bile, which we observe on arriving in hot climates, corresponding to the increased cuticular discharge. I shall here offer one practical remark, resulting from this view of the subject, and which will be found deserving of every European's attention on his emigration to Southern regions. Namely, that as the state of the perspiratory process is a visible and certain index to that of the biliary, so every precautionary measure, which keeps in check, or moderates the profusion of the *former* discharge, will invariably have the same effect on the *latter*, and thus tend to obviate the inconvenience, not to say the disorders, arising from redundancy of the hepatic secretion. To this rule I do not know a single exception; consequently its universal application can never lead astray in any instance. But this subject will be better elucidated, and more clearly explained hereafter.

To proceed. It is well known, without having recourse to Brunonian doctrines, that if any organ be stimulated to *inordinate* action, one of two things must in general ensue. If the cause applied, be constant, and sufficient to keep up, for any length of time, this *inordinate* action, serious injury is likely to accrue to the organ itself, even so far as *structural* alteration. But if the cause be only temporary, or the force not in any great degree, then an occasional topor, or exhaustion, as it were, of the organ takes place, during which period its *function* falls short of the natural range. To give a familiar example, of which too many of us are quite competent to judge:—thus, if the stomach be goaded to immoderate exertion to-day, by a provocative variety of savoury dishes and stimulating liquors, we all know the atony which will succeed to-morrow, and how incapable it then will be of performing its accustomed office. It is the same with respect to the liver. After great excitement, by excessive heat, violent exercise in the sun, &c. a torpor succeeds, which will be more or less, according to the degree of previous excitement, and the length of time which the stimulating causes have been habitually applied. For instance, when Europeans first arrive between the tropics, the degree of torpor bears so small a proportion to that of preceding excitement, in the liver, that it is scarcely noticed; particularly as the debilitated vessels in this organ, *continue* (similar to the perspiratory

vessels on the surface) to secrete a depraved fluid for some time *after* the exciting cause had ceased; hence the *increase* of the biliary secretion occupies our principal attention. But these torpid periods, however short, at first, gradually and progressively increase, till at length they far exceed the periods of excitement; and then a *deficiency* of the biliary secretion becomes evident. This is not only consonant to experience, but to analogy. Thus when a man first betakes himself to inebriety, the excitement occasioned by spirits, or wine, on the stomach and nervous system, far exceeds the subsequent atony, and we are astonished to see him go on for some time without, apparently, suffering much detriment in his constitution. But the period of excitement is gradually curtailed, while that of atony increases, which soon forces him not only to augment the dose, but to repeat it oftener and oftener, till the organ and life are destroyed!

Now it is somewhat singular, that this alternation of redundancy and deficiency, or in other words, *irregular* secretion in the biliary organ, should pass unnoticed by writers on hot climates. They, one and all, represent the liver as a colossal apparatus, of the most Herculean power, that goes on for years, performing prodigies in the secreting way, without ever being exhausted for a moment, or falling *below* the range of ordinary action, till structural derangement, such as scirrhosity, incapacitates it for its duty!

A very attentive observation of what passed in my own frame, and those of others, has led me to form a very different conclusion, and the foregoing statement will, I think, be found a true and natural representation of the case. I shall afterwards shew, that the secretion in question is frequently below *par*, in quantity, at the very time when it is considered to be redundant—all arising from irregularity and vitiation.

Here then, we have two very opposite states of the liver and its functions. 1st, inordinate action, with increased secretion —the periods generally shortening. 2nd, Torpor of the vessels in the liver, with deficient secretion—the periods progressively lengthening. In both cases, the bile itfelf is *vitiated.*

We may readily enough conceive how this last comes to pass, by an analogical comparison with what takes place in the stomach during, and subsequent to, a debauch. In both instances, we may conclude, that the chyme passes through the pylorus into the duodenum, in a state less fit for chylification, than during a season of temperance and regularity.—

So, during the increased secretion, and subsequent inactivity in the liver, the bile passes out into the intestines deteriorated in quality, as well as superabundant or deficient in quantity.

In what this vitiation consists, it is certainly not easy to say. In high degrees of it, attendant on hurried secretion, both the colour and taste are surprisingly altered; since it occasionally assumes all the shades between a deep bottle green and jet black; possessing, at one time, an acidity that sets the teeth on edge; at other times, and indeed, more frequently, an acrimony that seems absolutely to corrode the stomach and fauces, as it passes off by vomiting, and when directed downwards, can be compared to nothing more appropriate than the sensation which one would expect from boiling lead flowing through the intestines. Many a time have I experienced this, and many a time have my patients expressed themselves in similar language. But these are extremes that will be considered under Cholera Morbus, Bilious Fever, Dysentery, &c. The slightly disordered state of the hepatic functions, which we are now considering as primary effects of climate, and within the range of health, may be known by the following symptoms:—Irregularity in the bowels; general langour of body and mind; slight nausea, especially in the mornings, when we attempt to brush our teeth; a yellowish fur about the back part of the tongue; unpleasant taste in the mouth, on getting out of bed; a tinge in the eyes and complexion, from absorption of bile; the urine high coloured, and a slight irritation in passing it; the appetite impaired, and easily turned against fat or oily victuals. These are the first effects, then, of increased and irregular secretion of bile, and will appear in all degrees, according as we are less or more cautious in avoiding the numerous causes that give additional force to the influence of climate. For example: if I use more than ordinary exercise —expose myself to the heat of the sun—or drink stimulating liquids to-day, an increased and vitiated flow of bile takes place, and to-morrow produces either nausea and sickness at stomach, or a diarrhœa, with gripings and twitchings in my bowels But a slight degree of inaction or torpor succeeding, both in the liver and intestines, there will probably be no alvine evacuation at all, the ensuing day, till a fresh flow of bile sets all in motion once more. These irregularities, although they may continue a long time without producing much inconvenience, especially if they be not aggravated by excesses, yet they should never be despised,

since they inevitably, though insensibly, pave the way for serious derangement in the biliary and digestive organs, unless counteracted by the most rigid temperance, and the prophylactic measures which I shall carefully detail in their proper place. The reciprocal influence and effects which the hepatic and mental functions exercise on each other, will form an interesting inquiry, under the article Hepatitis.

Sec. 4.—Among the primary effects of a hot climate (for it can hardly be called a disease) we may notice the prickly heat (Lichen tropicus) a very troublesome visitor, which few Europeans escape.

This is one of the miseries of a tropical life, and a most unmanageable one it is. From mosquittoes, cock-roaches, ants, and the numerous other tribes of depredators on our *personal* property, we have some defence by night, and, in general, a respite by day; but this unwelcome guest assails us at all, and particularly the most unseasonable hours. Many a time have I been forced to spring from table and abandon the repast, which I had scarcely touched, to writhe about in the open air, for a quarter of an hour: and often have I returned to the charge, with no better success, against my ignoble opponent! The night affords no asylum. For some weeks after arriving in India, I seldom could obtain more than an hour's sleep at one time, before I was compelled to quit my couch, with no small precipitation, and if there were any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation! But this was productive of temporary relief only; and what was worse, a more violent paroxysm frequently succeeded.

The sensations arising from prickly heat are perfectly indescribable; being compounded of pricking, itching, tingling, and many other feelings, for which I have no appropriate appellation.

It is usually, but not invariably accompanied by an eruption of vivid, red pimples, not larger in general, than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead, close to the hair. This eruption often disappears, in a great measure, when we are sitting quiet, and the skin is cool; but no sooner do we use any exercise that brings out a perspiration, or swallow any warm, or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be very distinctly seen, and but too sensibly felt!

Prickly heat, being merely a symptom, not a cause of good health; its disappearance has been erroneously accused of producing much mischief: hence, the early writers on tropical diseases, harping on the old string of "humoral pathology," speak very seriously of the danger of *repelling*, and the advantage of "encouraging the eruption, by taking small warm "liquors, as tea, coffee, wine, wey, broth, and nourishing "meats."—*Hillary.*

Even Dr. Moseley retails the puerile and exaggerated dangers of his predecessor. "There is great danger" (says he) "in repelling the prickly heat; therefore cold bathing, "and washing the body with cold water, at the time it is out, "is always to be avoided." Every naval surgeon, however, who has been a few months in a hot climate, must have seen hundreds, if not thousands, plunging into the water, for days and weeks in succession, covered with prickly heat, yet without bad consequences ensuing.

Indeed, I never saw it even repelled by the cold bath; and in my own case, as well as in many others, it rather seemed to aggravate the eruption and disagreeable sensations, especially during the glow which succeeded the immersion. It certainly disappears suddenly sometimes on the *accession* of other diseases, but I never had reason to suppose, that its disappearance *occasioned* them. I have tried lime juice, hair powder, and a variety of external applications, with little or no benefit. In short, the only means, which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were—light clothing—temperance in eating and drinking—avoiding all exercise in the heat of the day—open bowels—and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure is undoubtedly no easy task, but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault, without being roused into motion, the enemy, like the foiled tiger, will generally sneak off, and leave us victorious for the time.

PART II.

SPECIFIC DISEASES.

Eastern Hemisphere.

Section 1.—*Fever in General.*—It is not my intention to include in this Section what are called the *Symptomatic* fevers. It is to the subject of FEVER, strictly so called, that I shall confine my observations; and trite and exhausted as the theme may appear, I hope still to render it, in some measure, interesting. If I have omitted the adjective "*idiopathic*" it is not because I consider fever as in all cases dependant on topical inflammation or congestion; but because I wish to avoid a "war of words" about an abstract term. Some late writings, and particularly Dr. Clutterbuck's Essay, have divided the medical world in opinion, a very considerable portion subscribing to the Doctor's theory. There is still, however, as far as I can learn, a majority in favour of the old doctrine that fever may originate, and even proceed some way in its course, without local inflammation---or those topical affections which may be considered analogous to, or synonymous with local inflammation.

Contrary to the usual mode of proceeding, before entering on the nature of fever itself, I shall take a rapid survey of the *causes* of this wonderful disease. By systematic writers these have been divided into remote and proximate; but the latter being the actual *state* of the disease, will not yet come under consideration. The remote causes are subdivided into predisponent and exciting. The predisponent, however, often become the exciting, and the exciting the predisponent causes, as the following example will illustrate. Two labourers set out from London, in the summer or autumn, to work in the fens in Lincolnshire. The one is a sober man, the other a drunkard. The latter is attacked with intermittent fever, while the former, though equally exposed, escapes. Here

inebriety is evidently the predisposing, and marsh miasma the exciting cause of the disease. But the sober man having returned to London in the winter, commits a debauch, and immediately afterwards he is seized with ague. Here, on the other hand, the latent miasma becomes the predisposing, and drunkenness the exciting cause of the fever. Let this be borne in mind, for it may help to explain more than at first sight might be expected.

Speaking generally, however, the two great exciting causes of fever are human and marsh Effluvia; while the predisposing causes are almost innumerable. The more prominent, however, are, plethora—inanition from excessive evacuations—the depressing passions—excess, whether in eating, drinking, gratification of the sensual passions—mental or corporeal exertions—extremes of atmospheric heat and cold, especially alternations of these or of heat and moisture—sol-lunar influence.

Now experience has determined, that of the foregoing and many other predisponent causes, any *one* (excepting perhaps the last,) will, when in a very high degree, induce fever without the assistance of any other. If this be the case, then, it is a natural and just inference that the operation of marsh and human effluvium on the human frame bears a very considerable analogy to the operation of those causes enumerated as generally *predisposing* to, but sometimes actually *exciting* fever. This may give us a clue to assist in unravelling the *ratio symptomatum* hereafter; but before entering on the effects, we shall say something of the causes themselves.

Human Effluvium or Contagion.—The existence of this febrific miasm as the cause of fever does not appear to have been known to the ancients, since Hippocrates makes no mention of it, and the strict prohibitions against *contact* with unclean or diseased persons recorded in the Mosaic code, do not seem directed against febrile, but chronic or local infection—probably against cutaneous or genital defædations. It is curious, however, that Pliny, when describing the progress of an *endemic* fever, apparently solves a question which to this moment, gives rise to the most violent altercations—namely, whether endemic fevers ever become contagious? "Et primo *temporis ac loci* vitio, et ægri erant, et moriebantur; postea, *curatio ipsa et contactus* ægrorum vulgabat morbos." Lib. xxv. ch. 26. But more of this hereafter.

Notwithstanding the exertions of Dr. Brancroft and some others to invalidate certain testimonies respecting the genera-

tion of contagious effluvium, facts too stubborn to be swept away by the brush of sophistry attest that the effluvium issuing from the bodies of a number of human beings confined too closely, whether in a state of health or disease, will occasionally produce a contagion which is capable not only of exciting fever among those so confined, but of propagating itself afterwards from them to others.

Setting aside the testimonies of Bacon, Lind, Pringle, and others, the transports which received and conveyed home the wretched remnant of Sir John Moore's army, after the battle of Corunna, afforded the most decisive and melancholy proofs that bodies of men confined close together between the decks of a ship in stormy weather, will soon become sickly, and that their diseases may be communicated to nurses and others, after they are landed, washed, and placed in the most clean and airy hospitals. It will hardly be contended that these men could have carried any infection on board, either in their persons or clothes, after a rapid retreat, during which, almost every stitch of garment was washed from their backs by the incessant rains. A dreadful and sanguinary battle at the water's edge, gave them no time to contract infection or even cloathe themselves at Corunna. They precipitated themselves tumultuously, naked, exhausted, and wounded, into the first vessels that came in their way, and were there crowded from choice or necessity during a cold, wet, and tempestuous passage across the Bay of Biscay. On this passage a most fatal typhoid fever broke out, which spread far and wide among the nurses and medical attendants of the hospitals in England where they were landed. They embarked indeed with an unusual degree of predisposition to disease, arising from excessive fatigue—chagrin—exposure to the elements by day and night—nakedness—want—occasional inebriety—insubordination, and last of all—exhaustion after a tremendous conflict that closed this disastrous retreat. It was utterly impossible, however, that a particle of fomites or the matter of contagion could exist among them at the moment of their embarkation; and it was too fatally proved that every transport exhibited a most destructive focus of infectious fever before they reached England. I have dwelt the longer on this point, because it bears upon questions that are now agitating the public mind; and because Time's telescope cannot be inverted here as it has been on other occasions, nor facts be denied that are so recent in the memory of thousands now alive. Within a few yards of the spot where I now write, the greater part of a

family fell sacrifices to the effects of fomites that lurked in a blanket purchased from one of these soldiers after their return from Corunna!

It is not so well ascertained that the efluvia from *dead* animal matters *alone* will generate a contagious disease; at least it has been fashionable to deny such an occurrence since Dr. Bancroft's publication. But there are not wanting respectable testimonies in the affirmative; and it does not seem very incredible that offensive exhalations from large masses of putrefying animal matters should, under certain circumstances, produce fever, as related by Forestus and Senac. The late fatal fever at Cambridge appears to have been of local origin at first, but propagated by infection afterwards.

Of what this contagious matter consists, we are totally ignorant, as it is perfectly incognizable by the senses, and incapable of being submitted to chemical analysis. Many people have declared that they felt an indescribable taste in their mouths, and sensation over their frames, together with a peculiar odour impressed on their olfactories, at the moment of imbibing the poison; but it cannot be ascertained whether these were produced by the contagion itself, or by any effluvium accompanying or conveying it.

With the laws which govern contagion, we are fortunately better acquainted. It does not appear to be much under the control of the seasons, since a full *dose* of it will produce the specific effect at any time of the year. As warm air causes a greater exhalation from bodies, it might, *a priori*, have been expected that this contagion would spread most in the summer; and the popular opinion to this day is, that hot weather is prejudicial to patients labouring under typhoid fevers. We find, however, that it is in winter that these diseases are most prevalent. The reason appears to be simply this:—the freer ventilation of summer dilutes and dissipates the exhalations from the sick, rendering them innocuous; while the confined air of small apartments among the poor, in winter, tends to condense, as it were, the febrific effluvia, and embue the bedding, &c. of the sick with the same; forming a fruitful source for the dissemination of the disease by means of *fomites*, a form in which the matter of contagion is eminently powerful. Experiments have proved that this contagion, when diluted with pure atmospheric air, becomes harmless at the distance of a few yards—perhaps of a few feet; and hence the surest means of preventing its dissemination are, cleanliness and ventilation. Indeed it is only where

these *cannot* be procured, that the *juggling* process of fumigation need ever be resorted to; and I firmly believe that if the latter ever checked the spread of contagion, it was more by its effects on *mind* than on *matter*. The history of animal magnetism alone will teach us how far imagination may go in actually arresting the progress of disease in its full career; and in no case have *mental* impressions more decided effects than in checking or facilitating the operation of contagion on the human body.

The next thing to be observed is, that from idiosyncrasy of constitution, some individuals are infinitely less susceptible of the contagion than others; and also, that habitual exposure to it, renders us more capable of resisting it, as is exemplified among nurses and medical men. This circumstance appears explicable on the principle of *habit* which renders us able to bear a larger dose of any other poison, as of Arsenic, Opium, &c. Dr. Haygarth affirms that he has been in the *habit* of breathing, *almost daily*, air strongly impregnated with the infectious miasms of fever, during a space of more than 50 years, and yet never but once caught a fever in all that time. Some periods of life, however, render the body more susceptible than others—the very young and very old are more exempt than those of intermediate ages. Ulcers and other chronic *diseases*, also, seem occasionally to confer an insusceptibility on the constitution. The *latent* period, or that which elapses between the reception and manifestation of the contagion differs exceedingly, according to the degree of concentration in the poison and the predisposition of the subject. There is no doubt but that many doses of the poison are received which produce the fever or not according as the various predisposing causes are applied. It is, however, seldom less than fourteen, or more than sixty days between the receipt of the infection and the unfolding of the fever.

Marsh Miasma.—The febrific effluvia of marshes, as well as human contagion, seem to have escaped the notice of Hippocrates. This is the more to be wondered at, as many of the fevers which he describes are clearly the bilious remittent fevers of the present day, [*see, for instance, Popularium* 1. *Ægrotus octavus,*] and produced, of course, by the same causes. Lancisius was the first who drew the attention of medical men to the subject, since which, marsh effluvium has been traced as the cause of some of the most destructive endemics that occur both within and without the tropics.

The fevers of Cadiz, Carthagena, Gibraltar, and Zealand, may competite, in respect to virulence and fatality, with those of Batavia, Bengal, St. Domingo, and Philadelphia. The term *marsh*, is not so proper as *vegeto-animal* effluvium or miasma; since experience and observation have proved, that these febrific exhalations arise from the summits of mountains as well as from the surfaces of swamps. The mountains of Ceylon, covered with woods and jungle, and the vast ghauts themselves, give origin to miasmata that occasion precisely the same fever as we witness on the marshy plains of Bengal.—But the subject of Miasmata will again come under consideration, in the Section on Endemic of Bengal.

Ratio Symptomatum.—We now proceed to trace the *action* of these febrific causes on the human frame—or in other words, the *ratio symptomatum* of fever itself; for in nature and in truth, there is no such thing as a *proximate cause* of this disease, the whole train of symptoms being a series of causes and effects, extremely difficult to delineate or comprehend. If any thing could deserve the name of *proximate cause*, it would be some peculiar state or phenomenon *invariably present* at the beginning of fever, and without which, the disease could not be said to exist. But all writers agree that there is no *one* symptom, state, or phenomenon which is constantly observable in fever. Neither quickness of pulse —increased heat—thirst—nor headache can be laid down as pathognomonic; for although *some* of these are *always* present, no *one* of them is invariably so.

If an appeal, however, be made to accurate clinical observation, it will probably be found that from the first till the last moment of fever, *two phenomena* are constantly present—a derangement in the balance of the *circulation*, and of the *excitability*. If the calibre of the radial artery, or the strength and velocity of its pulsations shew nothing preternatural, (which by the bye will be a rare occurrence) yet, the experienced physician can instantly detect the unequal distribution of the vital fluid, as well by the torpid state of the *extreme* vessels on the surface, and throughout the glandular system, as by the turgidity of the *primary* trunks. The imperfect perspiration and secretions will point out the one; the peculiar febrile anxiety—hurried respiration on attempting to sit up or move—fulness of the præcordia, and heaviness about the head, will clearly demonstrate the other. In

no one instance, during a long acquaintance with fever, have I failed to notice these indications of a deranged balance of the *circulation*.

The proofs of broken balance in the *excitability* are equally manifest. It is now well known how much the functions of the glandular system are dependant on the nervous. In fever, the secretions are never perfectly natural. They are in general scanty—sometimes preternaturally copious; but always depraved. While this torpor or irregularity is going on in the glandular system, the nerves of sense shew plain marks of inequilibrium of excitability. The same degrees of light and sound that in health would be pleasing, will, in fever, be either distracting, or incapable of making any impression at all. The stomach will be in a state of morbid irritability, and the intestinal canal completely torpid. Speaking generally, however, the glandular or secreting system is irregularly torpid—the nervous or sentient system, irregularly irritable and debilitated.

Now if we find that the general operation of the various *predisposing* causes of fever, is to disturb more or less, according to the force and condition of the subject, the balance of the circulation and excitability, we advance one step nearer to a knowledge of this *proximate cause* in fever, because we find in it the same *ratio symptomatum* as in all the phlegmasiæ, modified only by the *exciting* cause.—For example: one man is exposed to a rapid atmospherical transition, or a current of cold air when the body is heated; another man is exposed to the effluvium issuing from the body of a typhous patient; a third commits a great and unaccustomed debauch in spirituous or fermented liquors:—a fourth is overwhelmed with a series of losses and misfortunes; a fifth is exposed to the exhalations arising from a fen; while a sixth performs a rapid and toilsome march under an ardent sun. These six men (and the list might be far extended) will have six different kinds of fever—all agreeing, however, in the two points under discussion [a derangement of balance in the circulation and in the excitability] but each offering *peculiar* traits and phenomena, in consequence of the *peculiarity* of cause.

Thus the *first* patient will, in all probability, have a fever remarkable for great vascular action, or derangement of the circulation, with a determination to some internal organ, most likely the lungs, in which determination or inflammation consists the chief danger.

The *second* man will have a fever at a much longer interval from the application of the cause, and which, contrary to the former case, will shew greater marks of derangement in the balance of the excitability, than of the circulation. In this instance, the functions of all the organs will be more or less affected; the fever sometimes running its whole course without producing morbid alteration of structure; at other times, giving origin to congestion or inflammation in the brain, liver, stomach, &c. destroying the patient at various and uncertain stadia of the disease. To these peculiarities may be added the power of propagating itself by reproduction in other subjects.

The *third* man will have high vascular action, with considerable determination to the head, stomach, alimentary canal, &c. or probably that peculiar affection denominated "delirium tremens."

The *fourth* will have what is called a slow nervous fever so admirably described by Pringle.

The *fifth* will have a fever differing from all the preceding, inasmuch as it will shew great remissions, or even intermissions, on alternate days, with determinations, if long continued, to the liver and spleen.

The *sixth* man's fever will evince great violence at the beginning, with little or no remission; and end in a sudden determination to an internal organ—generally the liver; or change into a long and dangerous typhoid type.

Now the only symptoms or circumstances that are *invariably* present in *all* these cases, are the *inequilibria* above-mentioned; the other varieties appearing to depend on the difference of cause, and idiosyncrasy of constitution. Need we then seek farther for a *proximate cause* of fever?

All the causes then of fever, from the most remote and predisposing, to the most immediate and exciting, however varied may be their *mode of action*, tend constantly to one point, and directly or indirectly to induce derangement in the balance of the circulation and excitability. Some of these *appear* to produce their *first* effects on the vascular, others on the nervous system. Thus atmospherical vicissitudes evidently give rise to violent oscillations of the circulation; yet these transitions, and still more the oscillations must secondarily affect the nervous system. On the other hand, human and marsh effluvia seem to make their *first* impression on the nervous system, the circulation apparently becoming deranged

consecutively. Of the two febrific causes, however, human contagion shews its effects most on the nervous—marsh miasma, on the circulating system. Debauches and excesses operate on both systems, hurrying the circulation, exhausting the excitability, and producing fever, with or without local inflammation. The depressing passions, like human and marsh poison, seem also to affect *primarily* the nervous system, which, through every stage of the fever bears the onus of disease. Excessive muscular action and an ardent sun so much derange the circulation and the functions of certain internal organs, as to induce great fever with determination to the biliary organs in particular.

The manner *how*, and the reason *why* these various causes, predisponent and exciting, act on the human frame producing the phenomena of fever, are equally inscrutable as the manner *how*, and reason *why* tartrite of antimony should have a tendency to act on the *upper*, and aloes on the *lower* portion of the alimentary canal. Let any person demonstrate the *modus operandi* of these two simple substances, and then I shall engage to demonstrate the *modus operandi* of human and marsh effluvia. The nature or essence of many of these causes themselves, is also totally beyond our comprehension. Some of them are even *ideal*, as the various depressing passions, &c. Yet we must not cease to investigate the *effects* though we are ignorant of the nature and mode of action of the *causes*.

We shall now select one cause, and trace its operations on the human frame, as a sufficient specimen and explanation of the ratio symptomatum in all. The varieties and peculiarities from this specimen being, as I have stated before, ascribable to variety of cause and peculiarity of constitution.

A man after exposure to the miasmata of marshes, begins to exhibit symptoms of diminished energy in the nervous system, evinced by the various feelings and phenomena which usher in the cold stage of fever.

The power of the heart and arteries appears evidently to be weakened, the consequence of which is an inability to propel the blood to the surface and throughout the secretory organs; and from the diminished excitability of the system, we observe a quiescence of the capillaries, and a shrinking and coldness of all external parts, without the intervention or necessity of spasm. In this state it follows, of course, and is allowed by all, that the great volume of blood is confined to the heart, and large internal trunks of vessels. But this appears an

inadequate explanation of the swelling, tension, oppression, and even pain about the hypochondria, as well as of many other of the symptoms attendant on the cold stage of fever in particular. If during the latter, I place my hand on the radial artery and endeavour to estimate its calibre, and the quantum of blood transmitted through it in a given time, compared with what takes place in the hot stage, or even in health, I shall conclude that the artery is not then above one-third the size, nor the quantity of blood passing through it, more in proportion. Such being the case, it is difficult to conceive how the whole mass of blood can be in *actual* circulation at this time. Besides, therefore, the confinement of a large share of it to the heart and large vessels, where its motions must be slow, I venture to affirm that another considerable portion of it is *arrested*, as it were, and accumulated in certain situations, where it remains, *pro tempore*, out of the course of *actual* circulation. This congestion or complete quiescence, takes place in the portal circle, where the blood is, at all times, languid in its current, there being only a slight *vis a tergo*, and but little muscular propulsion. The consequence of this must be, that not only the liver and the various branches of the vena portarum, will become turgid, but also the spleen, (which returns its blood to the heart through this channel) the stomach, pancreas, and intestines, will participate in this turgescence.

If it be asked why the blood should cease to circulate in these parts during the cold stage of fever, sooner than in others; I answer that the portal is the only circle or set of vessels in the sanguiferous system, *originating and terminating* in capillary tubes, or inosculations with other vessels. They begin by the minutest threads from the stomach, spleen, pancreas, and intestines; these enlarge as they approach the liver; there they diverge, and finally dwindle again into the same diminution with which they commenced. All other veins dilate as they approximate to the heart, thereby affording more and more facility to the return of the blood, which is in most places assisted by the action of circumjacent muscles. The temporary quiescence or torpor, then, of the extreme branches of the vena portæ in the liver, from sympathy with the extreme vessels on the surface (before elucidated, and I hope satisfactorily proved) must completely check and arrest the reflux of blood from the whole of the viscera abovementioned. This state of things at once explains the tension, elevation, pain, weight, and anxiety about the

præcordia. It shews why the biliary and pancreatic secretions are in common with, and still more particularly than others, entirely checked for the time, while the gradual accumulation and temporary abstraction, as it were, of so great a proportion of the vital fluid from *actual* circulation, will readily account for most, if not all the phenomena of the *cold* stage, many of which were inexplicable on other principles. It appears to me, indeed, that this *temporary* arrest of so much blood in the liver and portal circle (including the spleen) is one of the most admirable of nature's expedients to obviate more dangerous effects. When the balance of the circulation is broken, and the blood is determined from the surface upon the internal parts, were it at all to accumulate in the large vessels about the heart, and in the lungs, immediate death would be the consequence; but the local abstraction of so large a proportion of it, from *actual circulation*, by its quiescence in the circle abovementioned (where plethora is not so immediately detrimental) preserves the heart and lungs from being overpowered and suffocated, till reaction restores the equilibrium between the surface and the interior. From this view of the affair, the utility of the spleen, as an organ of preservation, is no longer doubtful.* But this accumulation of blood in the portal circle and viscera, must, of necessity, produce a corresponding plethora in the branches of the cæliac and mesenteric arteries leading to them; and since such large and important exits for the blood from the descending aorta, are, as it were blocked up, a greater share of the circulating mass will be thrown in consequence through the carotids and vertebrals on the brain, occasioning or increasing the headache and congestion in that organ. This, and the congestion in the lungs, however, will be principally caused by the difficulty, indeed the inability of the heart to propel the blood from the ventricles as fast as it returns to the auricles from the brain and lungs; hence the *venous* turgescence in both these organs, occasioning the headache, stupor, laborious respiration, and febrile anxiety attendant on the collapse or cold stage.

The effects of sympathy are likewise to be taken into consideration. I have mentioned that which exists between the extreme vessels on the surface, and those of the vena portæ.—The lungs too will sympathise with the skin, while the stomach and liver will sympathise with the brain, and *vice versa*.

* Vide Dr. Armstrong's query; Essay on Typhus, p. 78.

This state of things, however, lasts not long. Reaction at length takes place. Whether it be from "the stimulus of the blood itself"—from that of the "retained secretions"—from "accumulated excitability"—from the "vismedicatrix naturæ"—or from all combined, we need not stop to enquire, (because *final* causes can never be discovered, and because we are rather tracing the *quo* than the *quomodo* in fever) but so it is, that the brain, the heart, and the arteries re-acquire vigour—the two last driving the blood to the surface, with great increase of heat, and a more rapid circulation of the vital fluid, all of which, nevertheless, does not appear to come into motion, till the sweating stage. For this preternatural heat or febrile stricture seems to have the same effect, for a time, as the previous coldness or collapse, in preventing perspiration externally, and secretion internally; since we find the load and uneasiness at the precordia and epigastrium continue till the extreme vessels on the surface relax, and a sweat breaks out, when a *simultaneous* relaxation in the extreme vessels of the liver, lungs, &c. allows the blood to pass on freely to the heart, and the various secretions to flow, relieving the internal congestions. This last effect, so much accelerated by the cold affusion, in the hot stage of fever, seems to have escaped the notice of Currie and Clutterbuck.

As the headache of the cold stage, from *venous* plethora, is continued in the hot, from *arterial* distention (with a corresponding difference in sensation, as noticed by Fordyce) so the nausea and sickness at stomach, arising apparently in the cold fit from sympathy with the brain and liver, perhaps the skin, is continued in the hot, from the same causes (these organs being still affected, though in a somewhat different manner) and the vomiting is often brought on and kept up, by the sudden augmentation of gastric, biliary, and other secretions of a depraved quality, which are poured out towards the commencement of the sweating stage, particularly in hot climates, and in the hot seasons of temperate climates. In general, however, the irritability of the stomach subsides *pari passu*, as perspiration and secretion commence, with relief to the brain, lungs, liver, &c.

If, as some suppose, the cold be the cause of the succeeding hot stage, so in the latter, the violence of the re-action, ro rather over-action of the sanguiferous system, with the morbidly increased excitement of the nervous system; must predispose to a repetition of the fits, from the subsequent atony produced thereby. If there be sensorial energy

enough to enable the heart and arteries to clear the viscera and brain of the load of blood with which they were oppressed, and to set the secreting organs in action, then an *intermission* takes place; but if these circumstances be incomplete, a *remission* only. In what is called continued fever, it appears from the affection of the head, the load on the precordia, the confined pulse, the dry, hot, and constricted skin, with a corresponding diminished biliary secretion, and costive bowels, that the constitution is called upon for almost constant, or at least frequently reiterated exertions to relieve the internal congestions, and restore the secretions and excretions, marked by more or less of diurnal remission and evening exacerbation, till it either becomes habituated to the original cause, and restores the balance of the circulation and excitability, or sinks, unequal to the task, most commonly with the destruction (from inflammation or sanguineous determination) of an organ essential to life. Dissection has so repeatedly detected the existence of these inflammations, congestions, and effusions, in all fevers of violence, that it is not necessary here to quote any passages from practical authors on the subject. But it may be remarked, *en passant*, that no *one organ*, not even the brain, is so invariably the seat of lesion as to enable us to build any theory on the subject, and hence Dr. Clutterbuck has over-shot the mark by confining the cause of fever within the cranial parietes.

We now come to try the above theory by a direct application of its principles to *practice*, the grand and only legitimate criterion of its truth. If we can shew that it is consonant with, and elucidates the operation of those remedial measures which either ancient or modern experience has employed in fever, it is no trifling corroboration of its solid foundation. And, even if it points to the most successful plans of treatment which modern investigation has devised, it must be allowed to be a useful, though perhaps only a visionary theory.

It will not be necessary, however, to examine the whole farrago of remedies which ignorance, superstition, or prejudice had, at various periods, introduced for the treatment of fever; it will be sufficient to notice those which have stood the test of time.

1st.—VENÆSECTION.

Bloodletting is as ancient as the wars of Troy, and the practice of Podalirius. If Hippocrates neglected it, Aretæus,

Celsus, and Galen made ample use of this important measure. It is true, that even in our own times, the dogmas of the schools had nearly proscribed for a while, what nature and observation had pointed out from the earliest dawn of medicine to the present time, in every climate from the banks of the Scamander to the vales of Otaheite.

The bounding pulse, the fever-flushed cheek, the throbbing temples, and aching head, must indeed have vindicated the propriety of bloodletting in every æra, and in every mind not warped by the bias of some fashionable doctrine.

In these scrutinising days of investigation and experiment, the lancet has dispelled the mists of prejudice, the phantoms of debility and putrescency, with the delusions of the Brunonian school; and bleeding is justly regarded as the paramount remedy, not only in symptomatic, but in all the more violent and fatal idiopathic fevers.

The consonance of this measure with the principles I have laid down, is so evident as scarcely to need comment. When the balance of the circulation is broken, and determinations take place to one or more organs, the most effectual means of restoring the balance, and of relieving these organs or parts from their overplus of blood, will be found either in local or general abstraction of the vital fluid. It is not from there being *less* than usual of blood, in some parts, but from there being *too much* in others, that the danger consists, and that we are called upon to reduce the whole mass below par. Nature herself invariably points out this indication, and in perhaps a majority of instances, fulfils it in her own way. Thus we find that every paroxysm of fever is terminated by some evacuation from the system, whether by perspiration, urine, increased secretions, or some local hæmorrhage. In what is called *continued fever*, the nocturnal exacerbations are terminated in the morning by some slight modifications of the foregoing evacuations; and in all fevers and all stages of fever, nature effects *depletion* by preventing *repletion*; and hence that invariable attendant on fever *anorexia* is one of the wisest and most salutary measures which nature can put in force to finally overcome the disease; though she is too frequently baffled in her attempts by the officious interference of the cook, the nurse, or perhaps the medical prescriber.

I shall now make a few remarks on the most judicious manner of employing this remedy in fever; for on this, in a great measure, depends its success; and to the contrary, I believe may be attributed not only its failure but its disgrace.

In the first place, the time for bloodletting in fever should be an object of great attention. It should not only be *early* in respect to the accession of the fever, but the acme of the paroxysm, or the height of the exacerbation should be selected as the proper periods, for making the abstraction. At these times the evacuation will produce an alleviation of symptoms, and often a solution of the paroxysm or exacerbation; whereas if taken during the remission of the fever, when the system is, as it were, in a state of collapse, deliquium animi is often the consequence, followed by a train of nervous symptoms and debility that are charged on the *measure*, when they ought to be placed to the account of the ill-judged period of its application.

The manner in which blood is drawn ought not to be neglected. When any strong determination to the head, or other organ exists, the vascular system so accommodates itself to the loss of blood from a *thready* stream that little or no relief is obtained for the suffering viscus, while the general strength is unnecessarily reduced by the quantum lost.

Although we are to be much less guided by the appearance of the blood drawn, than by the order and violence of the symptoms; yet as a certain coat or crust of fibrine very generally, though not invariably, covers the coagulum when there is any local inflammation going on, we should attend to those circumstances in the abstraction that are favourable to the developement of this criterion. Thus the stream of blood should be free and of a good size; and it should be received into the centre, not impinged against the side of, a narrow and rather deep bason, with a polished internal surface. If the reverse of these directions be observed, as is too often the case, the blood will not exhibit any inflammatory buff, though inflammation be actually present at the time.*

As in fevers, as well as some inflammations, it is not so much the general plethora of the vascular system, as the broken balance of the circulation that is to be corrected, so local abstractions of blood from the vicinity of those parts where the congestion or determination exists, are often of more importance than general bloodletting.

It is to be regretted that, whether from the prejudices of the patient or the inattention of the practitioner, the seat of the determinations in fever is rarely ascertained and relieved by topical bleedings. The violent headache, indeed, and arterial

* Vide the inestimable work of Dr. Armstrong on Typhus. Also Dr. Dickson's writings on Tropical Fever.

pulsation at the temples, frequently draw the practitioner's attention to that part, and leeches are accordingly applied; but the epigastric region, where there is always more or less fulness, and to which the vital fluid seems in most fevers to gravitate, is too much neglected. Leeches or scarifications should long precede the necessity for blisters in these parts.

2nd.—PURGATIVES.

The ancient physicians had a very limited range, and a very rough list of purgative medicines. They made, however, a considerable use of them. Of late they were almost neglected by Cullen, and proscribed by Brown, in the fevers of this country, unaccompanied with topical inflammation. Dr. Hamilton and the greater number of modern practitioners employ purgatives freely, without fear of that far famed, and much dreaded debility. The principle on which these act, in fever, are by no means generally understood; and the practice itself is frequently inefficient from this cause. Even Dr. Hamilton seems to attribute most of the good effects of purgatives in fever to the removal of irritating fecal remains. But if this were the case, the glysters of Cullen would have answered the same end, which, however, they did not. The removal of fecal accumulations, from the small intestines particularly, gives a more free descent to the blood through the abdominal aorta and its branches, and thus mechanically assists in the restoration of balance; the increased secretion from the mucous membrane of the alimentary canal, must also powerfully deplete the cæliac vascular system; but a very salutary *modus operandi* of purgatives in fever, has, I believe, escaped the notice of physicians, although I conceive it to be an important one; I mean the change from torpor of the intestines to a brisk peristaltic motion, whereby the blood which has been shewn to accumulate, and as it were stagnate, in the portal circle, is propelled forward, and the biliary secretion increased. Another salutary effect is produced by the sympathetic influence which the internal surface of the alimentary canal exerts on the cutaneous surface of the body; for although drastic purging will check profuse perspiration, yet where torpor pervades both the internal and external surfaces of the body, a restoration of the functions of the former contributes to the same event in the latter; a fact, of which any one may convince himself at the bed-side of sickness by an attention to the circumstances under consideration.

When therefore the peristaltic motion, the gastric, and intestinal secretions are roused by purgatives, the head which, from the peculiarity of its circulation, must suffer sanguineous congestion, is almost immediately relieved by the *change of balance*, thereby induced. From these considerations it will not appear a matter of indifference, what purgative medicine we use. Experience has taught us that some (for instance castor oil), do little more than clear the intestinal canal of what already exists there; that others (for instance the neutral salts, jalap, &c.) produce copious *watery secretions* into the alimentary tube, during their operation;—and that others still (for instance the submuriate of quicksilver), besides acting as a common purgative, increase particular secretions, as of the bile, and carry them off, whether in a healthy or morbid state.

From the importance of the hepatic function in the animal economy, and bad effects which result from any derangement or obstruction of it in febrile commotion, it is evident, and experience proves it, that into the combination of purgative medicines in fever, those of a cholagogue power should almost always enter. Hence it has been found both in this and other countries, that powdered jalap and submuriate of quicksilver formed a composition most admirably adapted to the purposes abovementioned, as may be seen by the writings of Rush, Jackson, Hamilton, Armstrong, Dickson, &c.

Hence also, we see how purging, by rousing the torpid circulation and excitability of the abdominal viscera, determining the blood through the various branches of the aorta which were before choaked up, and thereby removing the congestion in the head, restores strength, by relieving the sensorium, instead of adding to the pre-existent debility, as was dreaded by the Brunonians and Cullenians, and which dread still fetters the hands of numerous practitioners even in this country. The operation of purgatives then, is perfectly consonant with, and elucidates the fundamental principle, to be kept in view in fever—*a restoration of equilibrium in the balance of the circulation and excitability.*"*

3d.—COLD AND TEPID AFFUSION.

The operation of these *apparently* different measures, in mitigating or even arresting fever, is in perfect consonance with the principle laid down.

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* Vide Dr. Dickson's admirable papers in various numbers of the Edinburgh Medical and Surgical Journal.

Leaving out the effect of *sensation* on the nervous system, during the affusion of cold water on the febrile surface of a patient, it is evident that the violence of reaction (at which time alone it ought to be applied) is mitigated by the cold, while the febrile irritation of a strictured surface is taken off.

That these objects tend to a restoration of balance in the circulation and excitability, need not be insisted on; the other effect of cold affusion, namely, a subsequent perspiration, will also be found to have a similar tendency.

The effect of *tepid* affusion during reaction, or the hot stage of fever, is precisely analogous to that of the cold, only less forcible in degree; for it must be remembered that the tepid bath is, or ought to be of a much *lower* temperature than the surface of the body, when applied in the *hot* stages of fever, and consequently acts in reality as a cold bath, only in a much more gentle manner.

When it is applied in the cold stage of fever, its operation in drawing the blood to the periphery, and thus restoring the balance of the *circulation*, is direct and obvious; while in restoring sensibility to the torpid skin, the balance of excitability is, of course, equipoised. The action of cool air in fevers is easily explicable on the same principles.

4th.—MERCURY.

Various have been the disputes respecting the operation of mercury on the human system. A stimulant property has been very generally attributed to this mineral, apparently from its quickening the vascular action, and "exciting an artificial fever."* "Hence," says the Enquirer [*loco citato*], "its efficacy in remittent and continued fevers is very equi-"vocal. At the commencement of those diseases I believe "that it does mischief, if exhibited in any form to exert its "power on the salivary glands *alone*." It would be difficult to select a passage in any medical work which contains so much error and so much want of knowledge, in so small a space, as the above paragraph. In the first place, those who condemn the use of mercury most, condemn it on this principle, that in some very concentrated forms of inflammatory fever, as the endemic of the West Indies, it cannot be brought to exert its influence on the system in time, and therefore there is danger in trusting to its operation. Mr. Sheppard, of Witney, one of the ablest of the anti-mercurial

* Ed. Journal, vol. vi. p. 181.

party, expresses himself thus:—"The co-existence of febrile and mercurial action is generally admitted to be incompatible; if therefore the action *could* be superinduced in violent fever, we should be possessed of an invaluable remedy."—*Ed. Journal, October,* 1817.

In the second place, who ever saw mercury affect the salivary glands *alone?* Narrow indeed is that view of the mercurial action which stops short at its quickening the pulse, and "exciting an artificial fever." The fact is, that ptyalism is merely a symptom that the salivary glands are affected, in common with every other gland, and every secreting and excreting vessel in the system. Thus flood-gates are opened in all directions, and every part of the human fabric experiences a rapid diminution—in short, mercury is never more an *evacuant* than when it produces ptyalism. This general depletion is still farther increased by the ptyalism preventing any supply of nutriment which the patient or friends might wish to introduce.

I am ready to grant, indeed, that in certain high grades of the western endemic, or yellow fever, we cannot bring on this much desired effect of mercury; and why? Let Mr. Sheppard himself answer the question. "From the experience "of many years within the tropics," says this judicious observer, "I am disposed to coincide with those who believe "that the disease, in the highest degree of concentration, is "*irremediable* by any known means in medicine; for I have "remarked, in this extreme case, that whatever plan of cure "may be adopted, the rate of mortality remained unaffected "by variety of treatment." *Loco citato.* Now if mercury fails in these cases, so does depletion; but I most solemnly protest against the inference that, because pyrexia ceases when ptyalism appears, the *latter* is merely an effect or consequence of the former.

In the inflammatory forms of West India fevers where hepatic congestions are comparatively rare, I conceive that depletion *alone* is the best mode of treatment; but to draw a sweeping conclusion from this circumstance that mercury is totally useless, if not injurious, in all febrile states of the system, and in all climates, is most erroneous in principle, and injurious in practice. The ensuing pages of this essay will afford ample illustrations of the *febrifuge* powers of mercury; while its *modus agendi,* as an equaliser of the circulation and excitability, will be found to be in exact consonance with the principles here laid down.

5th.—EMETICS.

The gastric irritability which accompanies most fevers might have led to the suspicion that nature aimed at relief by unloading the stomach, and hence the early use of emetics.—They are now much less frequently employed; though it is certain that they produce other salutary effects beyond the mere evacuation of the stomach. They determine to the surface, in common with diaphoretics, and prodnce a relaxation there, which generally ends in perspiration. Their utility therefore, in certain states and kinds of fever, is unquestionable, and consonant too with the principle which I have endeavoured to establish; but their violence, in certain fevers and climates where unusual irritability of stomach too often prevails, has brought them much into disuse, even in opposite circumstances. The debility also which they induce gave the Brunonians a dislike to their employment.

6th.—DIAPHORETICS.

These have a close affinity to the last-mentioned remedies, but are of milder operation. In all fevers of a marked periodical type, there is such an evident remission, or solution of the paroxysm in the sweating stage, that Physicians must have very early endeavoured to imitate this salutary process of nature by artificial means. This, however, has often led to disastrous results; for observing that heated rooms, multiplicity of clothing, warm liquors, &c. induced perspiration in health, the same means were resorted to in disease, and too often with the most pernicious consequences. They knew not till lately, that the strictured surface of a febrile patient will seldom relax into a perspirable state, till its temperature is *reduced* below the fever heat, and consequently when they failed in their object, they did much mischief, and when they succeeded in *forcing* out a perspiration, the temporary relief obtained, by no means counterbalanced the previous increase of febrile excitement.

Now that the principles which govern the perspiratory process are better understood, the long and endless farrago of sweating medicines is reduced to a few neutral salts, as the citrate of potash, or acetate of ammonia, accompanied occasionally with small doses of antimony. These, with *cool* diluent drinks, are the only safe or salutary diaphoretics in fever; and probably act on the surface from its sympathy with the stomach.

It is needless to state that the operation of this class of remedies is in perfect consonance with the principles I have endeavoured to maintain.

7th.—TONICS AND STIMULANTS, INCLUDING BARK, WINE, OPIUM, &c.

It may seem a little strange, that the most diametrically opposite plans have succeeded in fever, and been lauded to the skies by their supporters as infallible. Hence many have supposed that were fevers left entirely in the hands of nature, as many would recover as under the most skilful treatment.

Whatever truth there may be in this, it is not equally correct that nearly the same proportion recover under all kinds of treatment. There is very little doubt but that under *judicious* modern measures, not only a greater proportion recover from the graver types of fever, but a vast number of fevers are prevented from assuming the more dangerous forms.

Neither need it be wondered at, that both stimulants and sedatives should occasionally prove useful in fever. We have shewn that when the excitability and vascular action are too great in one part of the system, they are deficient in others; hence the diffusive stimuli have the effect of rousing the torpid parts into action, but too often at the expence of the over-excited organs; and this has been the distinguishing feature of the Brunonian practice. Tonics and stimulants were also frequently necessary in the ultimate stages of fever, where early evacuations were not premised; because the system was exhausted by its own efforts, or by injudicious remedies, and nature required a stimulus at the close of the disease. But now it is found, after fatal experience, that by lessening reaction at the beginning, we preserve the powers of the constitution for ulterior efforts, and thereby obviate the necessity of stimulation at almost any period of fever.*

To shew how dangerous it was to draw conclusions respecting *debility* from the salutary operation of stimulants in fever, the following example may suffice. From deranged balance of excitability the heart and arteries become incapable of performing their office in a proper manner.—If their excitability be too great, they drive the blood with an impetus to the brain that may cause delirium: if their excitability be

* Vide Dr. Armstrong's work on Typhus, where the subject is handled with infinite skill.

defective, the heart is incapable of unloading the venous system, and distention of the veins and sinuses of the head produce the same effect. Now, wine, if given *judiciously*, and to a certain extent, in the *latter* case, will impart such vigour to the heart as will enable it to unload the venous system of the brain, and thereby remove the delirium, without giving too much impetus to the arterial system; but if the same medicine be exhibited in the former case, it will evidently increase the symptom it was intended to relieve!—In other words, some parts of the system being in a state of *torpor*, and others in a state of *irritability*, if stimulants be applied to the *former*, they *may* do good, but if to the *latter*, they *must* do harm. Hence the value and the necessity of discrimination in the practitioner; and the fatal effects of a *routine* practice.

In some of the more protracted fevers of this climate, assuming the typhoid and nervous type, the proper time for exhibiting the stimulating class of remedies requires the clearest judgment of the practitioner, and it is at these critical and decisive moments, that real ability unfolds its acuteness of discrimination, and snatches the patient from the jaws of death; while the blundering routinist unconsciously signs his quietus!

Little need be said of the minor or subordinate remedies, as blisters, sinapisms, &c. as their operation is evidently to restore the balance of the circulation and excitability by soliciting artificial determinations to superficial parts, with the view of relieving internal congestions or inflammations.

ENDEMIC FEVER OF BENGAL,

Commonly called the Marsh Remittent Fever.

Sec. II.—The importance of this disease will not be questioned, when it is considered, that in the small portion of the Hoogly, running between Calcutta and Kedgeree, full three hundred European sailors (better than a fourth of the ships' crews) fall annual victims to its ravages!* The subject therefore is highly interesting, and must receive a considerable share of our attention.

There is no unmixed good in this world. The inundations of the Nile and the Ganges, while they scatter fertility over

* Vide Capt. Williamson's East India Vade Mecum.

the valley of Egypt, and the plains of Bengal, sow with a liberal hand, at the same time, the seeds of dreadful diseases! Hence, Cairo and Calcutta have severely suffered from the overflowings of their respective rivers.

These consequences are not confined to tropical countries alone. Swamps and marshes, in all latitudes, give rise to intermittents and remittents, varying in degree and danger, according to the heat, rains, and other circumstances of the season. The deleterious influence of an atmosphere, impregnated with marsh effluvia, on the human frame, is in some places astonishing. In the lower districts of Georgia, life is curtailed to forty or fifty years: while in certain swampy situations of Virginia (Peterborough), it is asserted that twenty years bound the contracted range of human existence!

I have myself, in rambling through the villages of Beveland and Walcheren, been struck with the conspicuous marks of premature old age, which all, beyond maturity, exhibited; particularly among the peasantry. On enquiring the ages of decrepid wretches, withered, sallow, and apparently on the borders of fourscore, I was surprised to find that fifty-five or sixty years were all they had numbered in these noxious fens. Often have I been asked by inattentive observers, why so unhealthy a country should present so great a number of very old people? But, to return to the Ganges.

This immense river, originating in the mountains of Tibet, and winding in a south-eastern direction, collecting its tributary streams from all quarters as it proceeds, after a course of more than a thousand miles, bursts its boundaries, in the rainy season, and covers the plains of Bengal with an expansive sheet of turbid water. But the ground springing a little, as it approaches the coast, prevents the inundation from rushing at once into the ocean: it therefore disembogues itself slowly through a multiplicity of channels, that intersect the great Indian Delta, or Sunderbunds, in every possible direction.

This check keeps the plains of Bengal overflowed from the latter end of July till the middle of October; during which period, noted cities, populous villages, exalted mosques, and stupendous pagodas, are seen just above the level of this temporary ocean, surrounded by innumerable boats, now the habitations of domesticated animals.

At this time, vessels even of an hundred tons are beheld traversing the country in various routes, wafted by a breeze that seldom shifts more than a point or two from South.—The depth of water during the inundation, varies from ten

to thirty feet, according to the undulations of the ground. The original course of rivers is now known only by their currents, which may have a velocity of four miles an hour, on an average, while the great body of water, spread over the plains, moves at the rate of half a mile or a mile, in the same space of time.

A chemical analysis of the various impregnations and impurities which the Ganges and its contributory streams sweep down to Bengal, and which either subside in feculence on the soil, or are carried on to the sea, would form an interesting memoir;—it will be sufficient in this place to glance at a few of them.

The Western bank of the Ganges itself, between Hurdwar and Benares, consists in general of lime, concreted in irregular masses; and all the rivers which issue from the Western bank are more or less impregnated with the same substance; while on the opposite bank the waters partake of a strong solution of nitre, with which the plains of Oude, Fyzabda, and Gazeepoor, abound. The country lying between the Ganges and the Goomty, on the Eastern bank, is replete with fossil alkali, named "seedgy," giving rise to severe bowel complaints among the natives; while the swamps of Sasseram are annually in a state of partial corruption, sufficient to occasion the most malignant diseases in the month of November, when the sun's power promotes an astonishing evaporation, filling the air with miasmata, and spreading destruction among all the living tribes

The Mahana, the Mutwalla, and various other mountain rivers, that rush into the Ganges between Patna and Boglepore, are frequently tinged with copper. The 12th Battalion of Native Infantry were nearly poisoned by drinking at one of these streams.

But it would be endless to trace all the sources of pollution in the vegetable and mineral kingdoms; one or two only in the animal kingdom will be selected as specimens in that extensive department.

The Hindoo religion enacts, that as soon as the spirit has taken its departure, the body shall be burnt on the banks of the Ganges, and that the ashes, together with every fragment of the funeral pile, be committed to the sacred stream. In a country where dissolution and putrefaction are nearly simultaneous, the utility of such a measure is self-evident; but either from indolence or penury, the body is now generally placed on a small hurdle, and when little more than scorched, is pushed

off from the shore with a bamboo, there to float until it arrives at the ocean, unless it be previously picked up by a shark or alligator; or, which is frequently the case, dragged ashore by Pariar dogs, and devoured by them, in company with a numerous train of carrion birds of various descriptions. From one hundred to one hundred and fifty of these disgusting objects may be counted passing any one point in the course of a day; and in some places, where eddies prevail, a whole vortex of putrid corses may be seen circling about for hours together! It was very common for us to be obliged to "clear the cable" occasionally, of a human body, speckled over by the partial separation of the cuticle and rete mucosum from putrefaction.

Each contributory stream brings down its full proportion of these ingredients to the general reservoir; since the inland inhabitants have always recourse to that which is most contiguous to their village; and strange as it may appear, where no stream is at hand, the nearest tank, or jeel, performs the vicarious office of the sacred Ganges, supplying drink for the living, and a final receptacle for the dead! We may add, that the banks of this river present, particularly about the rising and setting of the sun, a motley group of all classes, and sometimes both sexes, sacrificing to the Goddess Cloacina, in colloquial association; not indeed offering their gifts in temples, but committing them freely to the passing current.

So born and fed mid Tauran's mountain snows,
Pure as his source, awhile young Ganges flows;
Through flow'ry meads his loit'ring way pursues,
And quaffs with gentle lip the nectar'd dews;
Then broad and rough, through wilds unknown to day,
Through woods and swamps, where tigers prowl for prey,
He foams along; and rushing to the main,
Drinks deep pollution from each tainted plain.

I have remarked, that the ground springs a little near the sea, and by resisting the progress of the inundation, lays the more inland plains under water. This is an important circumstance in the medical topography of the country; since the more complete the inundation, the more healthy are the inhabitants, till the fall of the waters in November and December exposes a number of miry and slimy marshes to the action of a still powerful sun, when those who are in their neighbourhood, are sure to come in for a share of remittents and intermittents.

It is worthy of remark here, that in those years, when the rains are late in setting in, many people are suddenly cut off

by the intense heat of the sun in June and July. But this is nothing compared to the havoc produced by a sudden and premature *cessation* of the rains, or *Bursautty*, as they are called. In this last case an immense surface of slime and feculence is all at once exposed to the rays of a vertical sun, that has lost nothing of his power by a Southern declination. The consequence is, that the profuse exhalation of miasmata spreads pestilence and death in every direction; while famine, from the rice being left dry before it has attained maturity, completes the dreadful catastrophe!

But the sunderbunds, and the country, for some way round Calcutta, being in most places rather above the level of high water mark, become, during the rainy season, an immense woody and jungly marsh, neither perfectly overflowed, nor yet quite dry—in a word, presenting a surface as well supplied with animal and vegetable matters in a state of decomposition, and combining all the other circumstances necessary for giving miasmata their full influence on the human body, viz. intense heat, moisture, calms, &c. as perhaps any spot of equal extent on the face of the globe.

These sunderbunds form a belt between the Hoogly and the Megna of about 180 miles in length, by 50 in depth, completely over-run with forests, underwood, and jungle; and inhabited by animals of various species, who are left to the uninterrupted possession of this frightful territory!

The rainy season commences about the middle of June, and lasts till the middle or latter end of October, though the waters are not drained off low situations till December. During this period, the deluges of rain that appear to come down occasionally "en masse" from the heavens, would almost stagger the belief of any one who had not witnessed them.

The inhabitants and domestic animals of inundated districts are all this time cooped up in a state of ennui, or torpor, which to an active European would be dreadful, had he not a number of mental, as well as corporeal resources for beguiling the tedious hours. But at Calcutta and Diamond harbour it is far otherwise. There the Europeans are not confined, and business must be attended to, as much as during the dry, or the cool and healthy season. It will not, therefore, appear extraordinary, that under all circumstances related, the marsh remittent fever should make such ravages among all classes, but more particularly among those who are exposed to the sultry heat of the day,—the rains, the dews, and intemperance.

Having sufficiently explored the sources from whence vegeto-animal miasmata take their rise, I shall defer the investigation of their nature, or operation on the human frame, till the fever which they occasion is considered.

There can scarcely be conceived a situation of greater anxiety and distress, than that in which a young medical man of any sensibility is placed, on arriving at an unhealthy spot in a foreign climate, unfortified by experience, unaided by advice, and, as is too frequently the case, but scantily supplied with books, containing local accounts of the country and its prevailing diseases

In such cases, he is forced to explore his way in the dark, agitated and alarmed by the mortality around him; a great share of which he attributes, perhaps with more remorse than justice, to his own misconduct, or ignorance of the proper treatment!

We arrived in the Hoogly, in the month of September, after a short run of little more than three months from England; which place we left without the least knowledge of our ultimate destination. The fever in question was then making prodigious havoc among the ships' crews at Diamond harbour, aad other parts of the river; nor were we long exempted from its visitation. All circumstances considered, I thought myself fortunate in having in my possession, the works of two celebrated authors, (Clarke and Lind) containing a full account of this fever, drawn from personal observation on the spot. I accordingly—

"Read them by day and studied them by night;"

In short, I was quite anxious to grapple with this Hydra disease, and shew the power of medicine over this scourge of Europeans.

Many days did not elapse before I had an opportunity of trying my strength against so formidable an opponent, and a very few trials convinced me I had calculated without my host, and that I must use other weapons than those furnished me by Drs. Lind and Clarke, if I meant to be victorious in the contest.

Dr. Clarke's *description* of this fever, however, is so singularly chaste and correct, that were I to draw the picture myself, I must either use his own words, or give a false portrait. I shall therefore only add a few observations of my own in a note, and recommend Dr. C's description to be carefully

compared with that of the yellow fever in another part of the work.

"This fever attacked in various ways, but commonly began with rigors, *pain* and sickness at stomach; vomiting, head-ache, *oppression on the præcordia*, and great dejection of spirits. Sometimes, without any previous indisposition, the patients fell down in a deliquium, during the continuance of which the countenance was very pale and gloomy; as they began to recover from the fit, they expressed the *pain* they suffered by applying their hands to the *stomach and head*; and after vomiting a considerable quantity of bile, they soon returned to their senses. Sometimes the attack was so sudden and attended with such *excrutiating pain at the stomach*, that I have been obliged to give an opiate immediately.*

"In whatever form the disease appeared at first, the pulse was small, feeble, and quick,—the pain at the stomach increased, and the vomiting continued. As the paroxysm advanced, the countenance became flushed—the pulse quick and full—the eyes red—tongue furred—thirst intense—head-ache violent, delirium succeeded, and the patient became unmanageable; but a profuse sweat breaking out in twelve or fourteen hours, generally mitigated all the symptoms.

"In the remissions, the pulse, which before was frequently 130, fell to 90. The patient returned to his senses, but complained of great debility; sickness at stomach, and bitter taste in the mouth. This interval, which was very short, was succeed by another paroxysm, in which all the former symptoms were aggravated, particularly the thirst, delirium, pain at the stomach, and vomiting of bile. If the disease was neglected

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* It is a little singular, that Dr. Lind, of Windsor, in his Inaugural Dissertation on this Fever, never once mentions "oppression on the præcordia,"—"pain at the stomach,"—or "fullness and tenderness in the epigastric region." I can safely assert, that I seldom saw an instance in which all of these were wanting—seldom, indeed, an instance in which they were not all present. It is true, that this endemic is not always arrayed in the same colours; but the above-mentioned symptoms are so constantly attendant on fevers, in all hot climates particularly, that the omission of them is rather remarkable.

Dr. Lind mentions a symptom not noticed by Dr. Clark, and which I have often observed. After remarking that bile was frequently ejected both upwards and downwards, he says,—"Vomitus et dejectiones tamen *plerumque albi coloris erant*, calcis aquæ commistæ, vel lactis illius quod lactentes evomunt." Neither of them has mentioned delirium, as often the *first* indication of the fever. Many a time have I been called to see men, whom their messmates represented as "mad;" not in the least suspecting that it was the fever which they were seized with. This symptom generally happened among young men who were employed in boats, and who were not only more exposed than others to marsh effluvia, but to the fervency of the sun by day, and often to the dews and night air. A few instances likewise occurred where the patient attempted to jump over-board. This symptom is not very rare in bilious and other fevers, where there is great congestion or determination to the brain.

in the beginning, the remissions totally disappeared, and the skin now became moist and clammy; the pulse was small and irregular, the tongue black and crusted, and the pain at the stomach and vomiting of bile became more violent." It is needless to say, that from this period till death closed the scene; the features of this fever were such as characterise the last moments of all violent and fatal fevers.

The unfavourable terminations were generally between the third and seventh day, though in some cases I have seen it go on to the fifteenth or twentieth day; but visceral obstructions were almost always the consequence; and hepatitis or dysentery completed what the fever failed to accomplish. I may add that several cases occurred under my own inspection where there was a yellowish suffusion on the skin, as in the endemic of the West, with vomiting of matter bearing a considerable similarity to the grounds of coffee. This suffusion of bile, or yellow colour on the skin, is by no means an uncommon symptom in the fevers of the East, as will be shewn hereafter. The natives themselves frequently exhibit this appearance, when extensive epidemics prevail in the lower situations of Bengal, as appears by the following quotation, from Captain Williamson. "Certainly, (says this intelligent "officer) it is common to see whole villages in a state of "*jaundice;* and in some years the ravages of the disease "(marsh remittent) are truly formidable." A torpid, or, at least, irregular state of the bowels, almost invariably precedes this fever; unless in cases where the effects of the paludal effluvia are suddenly brought out, by exposure to the intense heat of the sun by day, and the chilling dews and fogs of the nights, among boats' crews. In these, of course, there were few pre-monitory symptoms. In respect to the cure, Dr. Clark asserts, that "nothing is more indispensibly necessary "in the beginning, than to cleanse the intestinal tubes by "gentle *vomits* and purges." * * * * * "As soon as the "intestinal tubes have been throughly cleansed, the cure "must *entirely* depend upon giving the Peruvian bark, in as "large doses as the patient's stomach will bear, without pay-"ing *any regard to the remissions, or exacerbations of the* "*fever.*" Such are the plain and easy instructions which Drs. Clarke and Lind have left for our guidance in this fearful endemic. They certainly are not, apparently, difficult to follow; and Heaven knows I endeavoured, most religiously, to fulfil every iota of their injunctions; but with what success a single case will shew.

A young man, of a good constitution, in the prime of life and health, had been assisting with several others, to navigate an Indiaman through the Hoogly. The day after he returned, he was seized with the usual symptoms of this fever. I did not see him till the cold stage was past; but the re-action was violent—the head-ache intense—skin burning hot—great oppression about the præcordia, with quick, hard pulse—thirst, and nausea. An emetic was prescribed, and towards the close of its operation discharged a quantity of ill-conditioned bile, both upwards and downwards; soon after which, a perspiration broke out, the febrile symptoms subsided, and a remission, almost amounting to an intermission, followed. I now, with an air of confidence, began to "thrown in" the bark; quite sanguine in my expectations of soon checking this formidable disease. But, alas! my triumph was of very short duration; for in a few hours the fever returned with increased violence, and attended with such obstinate vomiting, that although I tried to push on the bark through the paroxysm, by the aid of opium, effervescing draughts, &c. it was all fruitless; for every dose was rejected the moment it was swallowed, and I was forced to abandon the only means by which I had hoped to curb the fury of the disease.

The other methods which I tried need not be enumerated: they were temporising shifts, calculated, in medical language, "to obviate occasional symptoms."

The plain truth was, that I knew not what to do; for the sudden and unexpected failure of that medicine on which I was taught to depend, completely embarrassed me, and before I could make up my mind to any feasible plan of treatment, my patient died, on the third day of his illness, perfectly yellow—vomiting to the last, a dark fluid resembling vitiated bile, and exhibiting an awful specimen of the effects which a Bengal fever is capable of producing, in so short a period, on a European in the vigour of manhood!

With feelings more easily conceived than described, I had the body conveyed to a convenient place, in hopes that dissection might afford some clue to my future efforts. On laying open the abdomen, I was surprised to find the liver so gorged, as it were, with blood, that it actually fell to pieces on handling it. Indeed, it appeared as if the greater number of the vessels had been broken down, and almost the whole of the interior structure converted into a mass of extravasation. The gall-bladder contained a small quantity of bile, in colour and consistence resembling tar, and the ductus

communis choledochus was so thickened in its coats, and contracted in its diameter, that a probe could scarcely be passed into it. Marks of incipient inflammation were visible in some parts of the small intestines, and the internal surface of the stomach exhibited similar appearances. The thorax was not examined, on account of the time taken up in getting at the brain. Marks of turgescence, in the venous system of vessels particularly, were there quite evident, and more than the usual quantity of lymph was found in the ventricles, but no appearance of actual inflammation.

This case requires little comment. It is pretty clear, that it would have required some ingenuity to devise a more injudicious mode of treatment, than that which I pursued. But it taught me an important lesson—it opened my eyes to my own folly, and, pace tantorum virorum, to the oversights of my teachers. It is but too true, that we are nearly as reluctant in acknowledging our failures, as we are forward in blazoning our successes. In so uncertain a science as that of medicine, this has always been a considerable obstacle to its progress and improvement; since, while we read of the great good fortune of others, and the surprising cures they have performed, and then find our own so far deficient in that respect, even when we are carefully treading their steps, we despond, and become exceedingly sceptical in regard to the truth of those statements. These reflections are not meant to bear on the veracity or candour of Dr. Clark, both of which I highly respect:—but as he has only published two unsuccessful cases—" in the most malignant fever he had ever seen in any part of the East Indies,"—viz. the Bengal fever, it may justly be questioned whether he would not have done more good, by detailing a greater proportion of the fatal terminations, than by confining himself to two solitary instances, without a single dissection. A careful perusal of the first of these that occur on the list (Henry Pope, case 6), will probably convince the reader that I was not the only person who had mistaken the nature of the disease, and that—

" Aliquando dormitat bonus Homerus."

In fact, the determination to the liver and the brain, is perfectly evident, from the beginning to the end of this case; and although no dissection took place, we cannot, for a moment, doubt the appearances which it would have exhibited.

The impression made on my mind, by the dissection on one hand, and the perusal of Dr. Clark's case (Henry Pope) on

the other, determined me to try venesection, notwithstanding the dreadful accounts which Dr. C. himself gives of its fatal effects. I had now several down with the fever; and must confess, it was with a trembling arm and palpitating heart, that I first opened a vein, expecting every instant to see my patient die under my hands.

He did not die, however; nay, he seemed evidently relieved, but the bad symptoms soon returned, and the bleeding was repeated, with brisk evacuations. He recovered.

I now carried the evacuating plan with a high hand, and with much better success than I expected. Fortunately for my patients, a great majority of them were fresh from Europe, and high in health and strength; these recovered wonderfully, after bleeding and evacuations, though not always.

But there was on board a class of men whom we had pressed out of ships on their return from India, who had experienced, not only the influence of the climate, but of depressing passions, arising from "hope deferred," and the galling disappointment they must have felt, while treading back their steps to a distant country, after they had been on the very point of mingling with their friends and relations at home!

These required a more discriminated mode of treatment. Evacuations at the very beginning were necessary; but something more was requisite, to clear the congestions from the head and liver. The fluids here, to use a simile, were too stagnant to drain off, of their own accord, even when a sluice was opened—they required propulsion.

It would be humiliating to myself, and perhaps uninteresting to my readers, to enumerate the many glaring blunders which I committed, and the false conclusions which I drew, before I arrived at any thing like a steady and successful method of checking this Herculean endemic. Let those whose eagle eye and towering intellect can penetrate, at a single glance, the secrets of nature, and curb with ease the reins of impetuous disease, place their hands on their breasts (if something within does not prevent them) and thank their God that "*they are not* like other men."

But to return to our subject. The first symptom that claims our most serious attention in this disease, is that irritability of the stomach, accompanied by a distressing vomiting. Till this is allayed, nothing can be done towards the cure, by way of medicine. Now venesection has considerable effect in procuring alleviation, even of this symptom. But the

trifling manner in which it is too often performed, when it is ventured on at all, does more harm than good. *Bleed boldly and decisively till the head and præcordia are relieved, or draw no blood whatever.*

While this is doing, a scruple of calomel, with half a grain or a grain of opium, should be immediately given; this will act like a charm on the stomach. I shall prove, in the course of this essay, what, indeed, is well known to many of my brother officers who have served in India, that twenty grains of calomel will act as a *sedative*, and so far from griping and producing hypercatharsis, it will sooth uneasiness, and rather constipate than purge. On this account, in the course of a few hours, when the vomiting is assuaged, some purgative must be given, as cathartic extract, with calomel, castor oil, or even salts, which will seldom fail to bring away a most copious discharge of intolerably fœtid, bilious, and feculent matter, to the unspeakable relief of the head and epigastrium. To facilitate and accelerate this most desirable object, purgative Glysters should be thrown up. The more copious the catharsis, the less danger there will be of the return of vomiting.

If there be now a return of any of those dangerous symptoms, intense head-ache, delirium, or pain in the epigastric region, no apprehension need be entertained of the lancet once more.* Those bugbears, debility, and putrescency, still paralize the arms of medical men in hot climates, notwithstanding the clearest evidence in favour of venesection, particularly where the subject is lately from Europe, and not broken down by the climate.

Immediately after the operation of the cathartic, the mainspring of the cure must be acted on. For this purpose, from five to ten grains of calomel, according to the urgency of the symptoms, combined or not with half a grain of opium, should be exhibited every four or six hours, till ptyalism is well raised; when, in nineteen cases out of twenty (I might say forty-nine out of fifty) there will be a remission of all the febrile symptoms, and safety secured. This is undoubtedly the *sine qua non*, in the medical treatment of this fever, as well as many other fevers in the East.

It is hardly necessary to remark, that emetics are exceedingly doubtful, if not prejudicial medicines in this endemic, since gastric irritability is one of the most distressing and dif-

* The jugular vein, where the head is oppressed, will be the best exit for the blood.

ficult symptoms with which we have to contend. Yet many judicious practitioners, in the navy especially, still employ them, as will be seen hereafter; my own experience, however, and observations are decidedly against them.

But, on the other hand, cathartics are eminently useful. There is, in this fever, either an obstinate costiveness, or dysenteric purging; no such thing as natural feces, tinged with healthy bile, will ever be seen: when such can be obtained by purgatives, a great and evident advantage is gained. It may seem strange that I should recommend calomel and opium anterior to the administration of laxatives; but, independent of the necessity which there is of allaying the irritability of the stomach, whoever will compare the discharge procured by cathartics given *previously* to the calomel and opium, with that which follows the *subsequent* exhibition of them, will decide in favour of the latter plan.

Once every day then, the dose of calomel, usually given every four or six hours, should be conjoined with ten or fifteen grains of ex. colcynth. com. jalap, or an ounce of castor oil, omitting the opium for that time. These will be sure to bring down a copious alvine evacuation, composed of highly vitiated bile and fecal sordes, that had been lurking in the convolutions of the intestines and cells of the colon, during that torpid state of the bowels which generally precedes the attack of fever.

This will greatly relieve the oppression and tension of the epigastrium, as well as the head-ache; indeed so striking is the amelioration of symptoms, after these intestinal evacuations, that in two or three instances I was tempted to follow them up, and try if they might not supersede the necessity of impregnating the system with mercury. I trode here on tender ground; I was forced to measure back my steps, and have recourse in the end to that powerful and invaluable medicine, but in one case it was too late! Warned by this, whenever I combined a purgative, with the calomel afterwards, I directed a mercurial friction or two to be employed during their operation, to prevent a halt in the pursuit of my ulterior and principal object—ptyalism.

In the mean time, while things are in this train, there are several objects which, though of a secondary consideration, the prudent practitioner will do well to keep in view. In the first place, the patient should be removed to the most airy and cool part of the ship or house; he should be made perfectly clean; and as there is, in nine cases out of ten, a great

determination to the brain, his feet may be immersed occasionally in warm water. His head should be elevated, shaved, and numerous folds of linen or cotton, moistened with vinegar and water artificially cooled, kept constantly applied to it.

Sir James Mc. Grigor remarks in his Medical Sketches, that the cold-bath did not succeed in the fevers of India. "On "my arrival there (says he) I tried it in several cases, but it "failed. This fever is commonly of the remittent type, there "is much reaction; it seems in most cases *symptomatic of* "*liver affection, and often terminates in hepatitis.*" There is some obscurity in the latter part of this passage; but at all events, Sir James Mc. Grigor cannot allude to the fever under consideration; for although the liver, as I shall hereafter endeavour to prove, is in this, and perhaps in all other fevers, *affected;* yet it would be carrying a theory to extremes to assert, that the Bengal Marsh Remittent, confessedly produced by paludal effluvia, in conjunction with heat and moisture, was, "in most cases *spmptomatic* of liver affection." It is probable that Sir James Mc. Grigor had not an opportunity of seeing *this* fever; as his observation, in regard to "liver affection," applies more strictly to those fevers denominated "Bilious," which are prevalent at Bombay, the Coast of Coromandel, and other elevated parts of India, in which Sir James Mc. Grigor served.—Vide Sec. 7.

How far the cold affusion in these *last* fevers may be applicable, this is not the place to inquire; but in the Bengal Remittent, it has been practised, time immemorial, among the natives themselves, many a century before a Jackson, a Wright, or a Currie, ever thought or wrote on the subject, as the following quotation from a gentleman *out of the profession,* and who, of course, has no other object than truth in view, will prove.—"We must, however," says Capt. Williamson, author of Oriental Field Sports, &c. "do the natives "the justice to allow, that the refrigerating principle, lately "adopted by some of our leading physicians, owes its origin "solely to the *ancient practice* of the Brahmans, or Hindoo "priests, of whom the generality affect to be deeply skilled "in pharmacy. I believe that, if taken in time, few fevers "would be found to degenerate into typhus, and that very "seldom any determination towards the liver, in acute cases, "would occur, were the refrigerating course to be adopted. "Often have I known my servants, when attacked with fever, "to *drink cold water* in abundance, and to apply *wetted* "*cloths to their heads,* with great success. The *former* has

"generally lowered the pulse considerably, by throwing out "a strong perspiration, while the *latter* has given immediate "local relief."—Vol. 2. p. 308.

I can confirm the truth of this, by experience, acquired long before I knew any thing of this native practice, and to which I was led by the unconquerable head-ach, heat, and throbbing of the temples, which nothing but venesection and the cold ablutions abovementioned, would completely allay.

Mr. Bruce describes a somewhat similar practice among the natives of Massuah, a very unhealthy island on the borders of Abyssinia.—

"Violent fevers, called the *Nedad*, make the principal "figure in this fatal list, and generally terminate the third day "in death. If the patient survives till the fifth day, he very "often recovers, by drinking water only, and throwing a "great quantity upon him, even in his bed, where he is per-"mitted to lie without attempting to make him dry, or change "his bed, till another deluge adds to the first." *Shaw's Abridgement, p.* 156. Cold water, cold cungee water, or either of these acidulated with tamarinds, chrystals of tartar, or nitrous acid, will be found the most grateful beverage. But it is necessary to remark, that, till the irritability of the stomach is allayed, however urgent may be the thirst, the patient should be restrained from drink, especially in any large quantities. The cold ablution over the surface of the body will help to mitigate the thirst, till the stomach is tranquilised.

Leeches succeeded by large and repeated blisters to the epigastric region, will be found a most valuable auxiliary to the above plan of treatment; and, where torpor in the lymphatic system of the abdomen is evinced by difficulty in affecting the mouth with mercury, the denuded surfaces should be dressed with mercurial ointment. With these means in use, I have generally awaited, with a kind of patient anxiety, the first symptoms of ptyalism; and on the third morning, I could frequently perceive a certain odour on the breath, prelusive of salivation. When this last came on *free*, I pronounced my patient to be secure.

But if no symptoms of saturation appeared, I have *then*, or indeed, if things wore an alarming aspect, I have sooner than this, either increased the doses of calomel, exhibited them at shorter intervals, or conjoined with them mercurial frictions. For if relief could not be procured on the third, fourth, or fifth day, the chance of recovery became smaller and smaller in proportion.

This relief sometimes preceded, sometimes succeeded; but was generally synchronous with the visible or sensible effects of mercury on the constitution, as evinced by the gums or breath. A mild and uniform diaphoresis, a refreshing sleep, and the appearance of natural stools, were the usual indications of this happy change; after which, as the ptyalism advanced, the train of morbid symptoms proportionally subsided, till at length the inability to eat, *in consequence of the soreness of the mouth*, became the principal complaint of the patient. Were I to go over the same ground again, I should be inclined to try a still more decisive system of depletion by bloodletting and purging, so as thereby to arrest the progress of the fever, even before the developement of the mercurial action. But times and circumstances will so vary the features of this and other fevers, that different, and sometimes opposite modes of treatment must be adopted.

That there may be cases, wherein the use of wine, and even bark, is indispensible, I shall not attempt to deny. But the latter, in particular, I seldom had occasion to employ, except in cases of protracted convalescence; or to prevent relapses at the full and change of the moon, when such accidents are very liable to happen.

I have only to remark further, that when this fever was combined with dysentery, an occurrence by no means unusual, the same treatment, with the exception of cold external applications, conducted equally to a happy termination.

As the object of this Essay is Utility, and its design, to convey as much information on each subject, in a small space, as possible; it becomes a duty to notice in this place the opinions and practice of a very high medical authority in India—Dr. Balfour, whose abilities and experience entitle him to every respect. I shall endeavour to condense his doctrine and directions into as few pages as I can, referring to his *second* Treatise on Sol-lunar Influence (Edin. 1790) where these are more explicitly developed than in any of his other publications.

Dr. B. considers the mild and regular intermittent, as well as the more violent and continued Bengal fevers, together with dysentery, as so many grades of the "*putrid intestinal remitting fever*," all of which he pronounces to be *infectious*. He conceives that the contagion proceeds from putrefying or putrid bodies, and which, passing down with the saliva, corrupts the mucus of the stomach and intestines. That *this* putrid matter being absorbed, and carried into the circulation,

gives rise to, and accounts for, the whole train of febrile symptoms. This is his theory, independent of "Sol-lunar Influence," which will be noticed hereafter.

With respect to the cure, he thinks that copious and continued purging would, in general, be sufficient to conduct mild cases to a successful issue; but as we are liable to much deception, he advises that in these, as well as in the most violent fevers of Bengal, after *two days* purging with calomel and other cathartics, to begin, on the *third* morning, to "throw in" the bark in substance, so as to administer two ounces in the course of forty-eight hours. At the expiration of this period, the calomel is to be again repeated at night, and a laxative the next morning; immediately after the operation of which, the bark is to be again reiterated for two days, and in the same manner as before. The purges and bark are thus to be alternated in exactly the above routine, till the disease is finally subdued. To give efficacy to this practice, a liberal use is to be made of opium, not only to keep the bark on the stomach, but to ease pain and procure rest.

With respect to those cases where there is *local affection*, Dr. B. only directs a superior degree of attention to be paid in guarding the body against cold, with occasional blisters and diaphoretics. In some rare cases, where the local affection is violent, he admits of bleeding, both general and local; but all the other plans are to be pursued in the manner prescribed, without any regard to paroxysms, remissions, or exacerbations, whatever.—Fifteen years afterwards, however, Dr. B. appears to have remodelled his plan of treatment, as the following passage evinces —

"Considering," says he, "that obstructions of the liver "very frequently shew themselves, in the common fevers of "this country, and may with great reason be suspected, in a "certain degree, *in all*, we cannot hesitate to admit, as an "essential and valuable principle, in the cure of fevers, *the* "*introduction of mercury into the system, so as to affect the* "*mouth in a moderate degree*, with the view of removing "obstructions, or other morbid affections of the liver; of "obtaining natural secretions, and of its thus contributing, *with* "*the other means* that have been described, to a speedy and "permanent cure." *Preface to a Collection of Treatises.*

I have thus given a fair view of two very different modes of treatment (and likewise their combination) in this dangerous disease. I have shewn my own preference for one of them, and I think substantial reasons for such: but I do not wish to

blindly condemn the others, because I did not find them successful.

He who treads over the same ground which I have done, will, in every probability, have ample opportunities of puting them all to the trial, and then he may decide on their merits. But I would recommend him not to be too sanguine nor condemn a practice from a few failures. It has not been my lot to find intertropical fevers so very tractable as some medical officers have, or say they have, found them. Those indeed who are most conversant with disease at the bed-side of sickness are well aware that no fixed rules or general plan of treatment are applicable at all times in fever, or in almost any other disease. But although the *means* must vary, the *indications* may be always the same. Thus I conceive that in those times and places where bark and stimulants proved more successful than depletion in tropical fever, there was equally as great a *derangement in the balance of the circulation and excitability* as where venesection and purgatives were carried to the greatest extent. The great art indeed is to early ascertain the prevailing diathesis both of constitution and climate, and promptly apply the most appropriate Methodus Medendi.

I should be sorry to suspect, much less accuse, any of my professional brethren of *wilful* misrepresentation ; but when *young* medical men are setting forth their cures by a *new* remedy, we may at least be allowed to enter that remarkably significant, though apparently paradoxical caveat of Hippocrates—EXPERIENTIA FALLAX.

As the cold season approaches, the fever changes from an almost continued to a plainly remittent, and finally, in December, to an intermittent form. From this time, for two or three months, the climate of Bengal is cool and delightful ; the only diseases being visceral obstructions, the sequelæ of the preceding endemic.

It has already been remarked, that this fever, when epidemic among the natives, occasionally commits the most destructive ravages. But the assimilation of their constitutions to the climate, their singularly abstemious habits, and various other causes, concur to shield them, in general, from its violence, so that it appears, for the most part, among this class, as an intermittent, but often of great obstinacy.

I have alluded to the *refrigerating practice*, which they have employed, time out of mind, in acute fevers : I shall now advert to some very efficacious native medicines, which

they apply to the cure of this disease, especially when it manifests itself in the form of agues, which prove exceedingly troublesome to the inhabitants of villages scattered among the marshy, as well as hilly and jungly districts. Their first object is the complete evacuation of all bilious and sordid colluvies from the stomach and bowels. For this purpose, they have recourse to a black purging salt—*Bit-Noben*, or *Cala Neemuck*, a solution of which in water is certainly one of the most nauseous potations that can well be conceived, having an abominable taste, and a flavour resembling rotten eggs, or sulphuretted hydrogen gas. This medicine proves eminently cathartic, and powerfully emulges the liver and its ducts, carrying off vast quantities of vitiated bile, and other offensive fecal matter, from the intestinal canal. This being effected, the kernal of a seed, produced by a low, creeping kind of cow-itch (Cœsalpina Bonducella) called by the natives, *Kaut-Kullagee*, or *Catcaranja Nut*, is taken to complete the cure.

The kernel is intensely bitter, and possesses the tonic or febrifuge powers of Peruvian bark, in a very high degree. But it has a manifest advantage over the latter; for, instead of producing any constipating effects in the bowels, it, on the contrary, proves mildly laxative. It may be easily conceived that, in a tropical country, where the biliary system is so commonly deranged, such a qualification is of incalculable utility. One of the kernels, pounded into a paste, with three or four corns of pepper, and taken three, four, or five times a day, in conjunction with the decoction of Cherettah [Gentiana Cherayita] is found so generally successful in curing intermittents, that it is adopted by many European practitioners; and will probably, at no distant period, supersede entirely the bark, to which it seems infinitely preferable in a hot climate, on account of the aforesaid aperient quality.

The *Cherettah* is a species of gentian, indigenous in the mountainous countries north of the Ganges, and is to be procured in every bazar throughout Bengal. It possesses all the properties ascribed to the gentiana lutea, and in a greater degree than are to be found in the latter root as it comes to us. The decoction of this herb forms a powerful auxiliary to the caranja nut, and their united efficacy in curing intermittents is undisputed.

CAUSES OF THE FEVER.

Drs. Lind and Clark dwell much on the putrefying animal and vegetable substances left on the miry shores of the Hoogly by each retiring tide; attributing a considerable share of malignity to the noxious exhalations arising from this source, during the intervals of high water, both by day and night. The argument is more specious than solid; and perhaps it is not founded on accurate or discriminating observation.

During the months of August and September, for instance, when fevers rage with their greatest violence, the rivers are swelled to the summits of their banks by the inundation, and the volume of water disgorged into the ocean is so immense, that the stream is perfectly fresh, and the flood tide scarcely felt at Calcutta; consequently, the rise and fall are comparatively insignificant. But in May and the beginning of June, on the other hand, when the rivers are shrunk far within their autumnal boundaries; when the heat is excessive; and when the tides are so rapid, that the *bore*, as it is called, rushes up past Calcutta, sometimes with the amazing velocity of *twenty miles an hour*, not entirely stopping till it reaches Nia-serai, thirty-five miles above the capital; then, indeed, at low water, each side of the river presents a broad shelving slope of mud and mire, covered with vegeto-animal remains in all stages of putrefaction, and disengaging the most abominable stench,—yet no ill effects whatever are produced by such exhalations.

For the solution of this phenomenon, we must look to the tides themselves, which, sweeping along these shores, every flood and ebb, never allow sufficient time for the extrication of that noxious effluvium, which arises from the *stagnant surface* of marshes, either *partially* covered, or just deserted by *annual* not *diurnal* inundations. Such marshes [and jungles which produce a similar effect] spread far and wide in every direction along the banks of this river, during, and for some time subsequent to, the rainy season; to these, therefore, and not to daily overflowed places, are we indebted for all the sickness and mortality we so fatally experience.

Another circumstance may probably contribute its share in correcting these exhalations at the period alluded to.—During the inundation, the waters of this river are quite *fresh*,

though turbid; whereas, in the dry season, when the tides are strong, a considerable proportion of *salt water* comes up every flood, and renders the stream, even at Calcutta, so brackish, as to occasion smart bowel complaints among those who drink of it at this time. A mixture of salt water with fresh, therefore, does not, as was supposed by Sir John Pringle, *increase* the noxiousness of marshy exhalations; on the contrary, we find, in this instance, that they are quite harmless, while rising from these extensive shores, when the water is considerably impregnated with marine salt. In respect to the marshes that run back from the river, they cannot, *during the inundation*, be more subject to flux and reflux than the river itself. The shores of all inlets and minor streams are under exactly similar circumstances to those I have stated of the Hoogly; and, finally, I may add, that it is the water of *inundations alone*, not tides, that ever bursts over the banks of the Ganges, to cover the adjoining plains; consequently the *marshes* are not subject to diurnal flux and reflux. I have been the more particular on this point, in order to set in a clear light the *validity* of those reasons which induced Dr. Lind, of Windsor, to read the recantation of his medical faith in *lunar influence*, in favour of "*the increased effluvia disengaged from the shores and neighbouring marshes at each retiring spring tide.*" Never was the fable of "dropping the substance to grasp at the shadow" more completely exemplified, than in this instance, which shews that "second thoughts are *not always* best." I much wonder that the ingenious Dr. Balfour, while lamenting the defection of his quondam supporter, did not adduce this unanswerable refutation, among others, of Dr. Lind's hypothesis.

In so luxuriant a climate as that of Bengal, and on so fertile an alluvion as the Delta of the Ganges, we may well suppose, that every spot,—almost every particle of matter, teems with animal as well as vegetable life. As the scale of existence descends, in the animal kingdom, the amazing circle of reproduction and decay is perpetually trodden by myriads of animated beings, whose ephemeral vitality has scarcely commenced, before it closes again in death! No sooner has the etherial spark—the "divinæ particula auræ," deserted its tenement, than the *latter* is resolved, by the heat and moisture of the climate, into its constituent materials, and formed without delay into other compounds:—

"With ceaseless change the restless atoms pass
"From life to life, a transmigrating mass."

It is during this dissolution of animal and vegetable remains, preparatory to new combinations and successive reproduction, that a certain inexplicable something is extricated, which operates with such powerful and baleful influence on the functions of the human frame.

This exhalation is capable of concentration, or rather accumulation; for when it is detained amid woods and jungles, as at this place, and especially during the rainy season, when there are no regular breezes to dissipate it, and when the beams of the sun are obscured, except at intervals, by dense clouds, it becomes exceedingly powerful, as the annual mortality too plainly proves.

That the exhalation of these miasmata, and their diffusion in the atmosphere, should be greater during the heat of the day than at night, when the air is raw and cold, appears more than probable; and yet an idea seems to prevail, that they arise from fens and marshes principally in the night. "The nature of an unhealthy, swampy soil," says Dr. Lind, "is "such, that no sooner the sun-beams are withdrawn, than "the *vapour emitted* from it renders the air raw, damp, and chilling in the most sultry climates." It is difficult to imagine how dews *descend* and vapours *rise*, at the same time.—Nevertheless, it is certainly true, that the stench emitted immediately after sunset, is much more perceptible to the senses than at any other period of the day. The reason of this is, that the shores and marshes *retain* their heat for some time *after* the rays of the sun are withdrawn, and consequently *continue* to emit vapours, which are not exhaled and diffused through the atmosphere, as by the sun and high temperature of the day; they therefore meet the descending dews and cool air, condensing and forming a thick fog, which hovers over the swamps, accompanied by a noxious and disagreeable odour. To this we must add, that the miasmata exhaled during the day, in all probability descend with the dews of the evening, and by meeting and combining with those that *continue* to be disengaged from their source, must form a concentration highly capable of affecting the constitution.—We accordingly find, that four out of five of those who suffer, are attacked, or receive the deleterious principle, at the period abovementioned.

Experience has shewn that *marsh* effluvium, though by no means so limited as *human*, does not occupy a wide range: at least, it becomes innoxious at a certain distance from its source, in consequence of dilution. The circumstance men-

tioned by Dr. J. Hunter, and confirmed by subsequent observations—namely, that "the difference of a few feet in "*height* gives a comparative security to soldiers quartered in "the same building," will be accounted for by the supposition which I have already stated, viz. *That as the miasms exhaled during the day descend in the evenings, they become more and more concentrated; till, meeting the exhalations from the still reeking marshes, a dense stratum of highly impregnated atmosphere is formed close to the surface of the earth.* Hence the superior degree of salubrity in the *upper* ranges of buildings; and, on the contrary, the extreme danger of sleeping on the ground in such places; many instances of which are recorded in the writings of Lind, Bontius, &c.

I am the more inclined to believe that vegeto-animal miasmata descend with the dews, and are *then* more formidable than in their ascent by day, from a circumstance that occurred to myself in October 1805.

Having occasion to take a passage from Madras to Calcutta, in a foreign merchantman, at that time, I sat late on deck, one evening after our arrival in the Ganges, the vessel being at anchor a mile from the shore, and not a breath of wind moving in any direction. As the dews began to fall, I perceived, all at once, a faint, heavy odour, to account for which I was much puzzled, as there was no breeze to waft any exhalation from the adjacent shores. My reflections were soon interrupted, however, by a sense of faintness, giddiness, and at length, nausea, with which I was suddenly affected. I immediately went below, not a little alarmed, and fully persuaded that I was seized with the fever, whose effects I had so much reason to dread. On drinking some warm water, to clear my stomach, I took a dose of calomel and opium, and next morning, castor oil. Although no farther symptoms of fever occurred, yet I felt an unusual degree of lassitude and depression of spirits for some days after I got to Calcutta.

The same is often felt on crossing the pontine marshes in Italy; and Dr. Mosely remarks, that he has felt a *shiver*, while passing the swamps to the west of Kingston, especially near the *ferry*, before the sun had dispersed the vapours.

The following remark of Dr. Lind's is favourable to the supposition of miasmata descending with the dews: "The "first rains that fall in Guinea are commonly supposed to be "the most unhealthy; they have been known, in forty-eight "hours, to render the leather of shoes quite mouldy and

"rotten." "It has been further observed, that woollen "cloths wet in those rains, and afterwards hung up to dry in "the sun, have sometimes become full of maggots in a few "hours." It is natural to suppose, that whatever exhalations arose, and were floating in the atmosphere, previous to the rainy season, would descend with the first showers, on the same principle as the miasmata exhaled during the day descend with the dews of the night.

In the months of September and October. 1799, while the Leopard and Centurion, two of Admiral Blankett's squadron, were working up from Mocha to Juddah, along the Arabian coast, they were considerably harrassed (the Leopard in particular) with a low fever, not of the remittent type, accompanied with great head-ache, weak, small, and quick pulse, pain at the stomach, and over the epigastric region, frequent bilious vomiting and purging, with uncommon debility and dejection of spirits. The days at this time were oppressively hot; the thermometer generally at 97°; the nights cool. But what was most singular, a copious fall of dew took place every night, *perfectly salt and bitter to the taste.* To this the fever was ascribed; and what corroborated the suspicion was, that the Leopard's crew slept exposed to the nocturnal vapours, and suffered ten times the sickness which occurred in the Centurion.

In the latter ship no medicine was found to check the bilious purging and vomiting so well as calomel and opium. The addition of antimonial powder was afterwards made. When debility only remained, decoction of bark with nitrous acid, was found useful. In some cases, attended with great febrile stricture on the skin, the cold ablutions were used with success. In the Leopard some mortality prevailed.

This view of the subject leads to a practical inference of considerable utility, viz. that when necessity compels us to penetrate through those insalubrious woods, jungles, or marshes, we should select that point of time at which we are *least likely* to meet those miasms, whether in their ascending or descending state. This period seems to extend *from three to six o'clock in the afternoon;* that is, *after* the greatest heat of the earth and air, and, consequently, the greatest evaporation; and *before* the condensation and return of such exhalations as rose during the day, and which combine with those still issuing from the heated soil, for some time after sun-set. It is but too well known, that the cool of the morning, of the evening, nay, in many instances, of the night, is generally pitched upon for wooding, watering, and other duties on

shore, to the great risk of those concerned in such dangerous occupations.

An attention to the above rule [founded on facts as well as reasoning] would certainly be productive of much good; particularly when it is considered, that the human frame, during the portion of time above alluded to, is, perhaps, better fortified against the impression of marsh effluvium, or other debilitating causes, than at any previous or subsequent period in the twenty-four hours. The seaman makes his principal meal at mid-day; he is then served his allowance of wine or spirits, and if a couple of hours rest is allowed at dinner, his energy and strength are much greater at three o'clock, than early in the morning or late at night. The European may object to this, by observing that the body and mind, recruited by sleep, are most vigorous in the morning. But I well know, from personal experience, that in tropical climates, and particularly during the rainy season, which compels all classes to pass the night between decks, the rest obtained from interrupted, I might say, stifled sleep, is very trifling. Indeed a general langour, lassitude, and want of appetite prevail till towards noon, when dinner, wine, and an hour or two of repose, give a tone and activity to the system, which continue till the evening. This is the time, therefore, when we can resist the agency of marsh effluvium better than at any other, and of course should be selected, especially since it is at this period that the miasmata are most diffused through the higher regions of the atmosphere, and consequently less potent in themselves. The next three or four hours, viz. from six till nine or ten o'clock, appear to be pregnant with danger to those on shore. Within the tropics there is little or no twilight; immediately the sun withdraws his beams [six o'clock] every thing is involved in darkness; dews and vapours *fall* from the upper regions of the air, and exhalations still continue to spring from the tepid marshes to meet them. At this juncture, therefore, in the places and seasons alluded to, the stratum of atmosphere in immediate contact with the surface of the earth, must be highly saturated with a principle but too destructive to human health and life; and the system is *then*, too, disposed to its reception, in consequence of the exhaustion produced by the heat and labours of the day, and the torpor induced by the coldness of the evenings.

This reasoning will be illustrated and confirmed by the following authentic particulars. In the month of November, 1804, two parties of men, belonging to his Majesty's ship

Tremendous, were employed on shore, at the Island of Madagascar; one party, during the night, filling water, the other cutting wood during the day. Four of the night party were attacked with the endemic fever of the country, and three of them died. The whole of the day party escaped the fever, though exposed to an intense sun, in the laborious occupation of wood-cutting.

About two years after this, His Majesty's ship Sceptre, in the same place, and upon a similar occasion, experienced a still greater disaster among her watering or night party, to whom the mortality was confined. Some interesting particulars respecting this fatal occurrence, I shall give in the words of the surgeon, Mr. Neill.

"The fever which attacked our watering parties at the Island of Madagascar, bears a striking resemblance to the endemic fever of the west;—like that too, it was not a contagious disease, of which we had the most cogent proofs, and corrobrated what we witnessed at a former period. I believe that the exciting cause of this disease was confined to the scite of the watering place, as no person was affected upon the wooding party, though *constantly exposed during the day*. The deleterious effects of nocturnal exposure were particularly exemplified here, by the disease raging most violently among the marines, who were on shore at night for the protection of the casks, and to whom the mortality was confined. The fever made its appearance among some of the same party who did *not* pass the night on shore, but in them it was infinitely milder, though similar in type and general symptoms. The watering place was encompassed from the sea by an amphitheatre of hills; and in nearly the centre of this ran the rivulet from which we filled, situated in a *marshy plain*, surrounded with some trees of the palm kind, and a thicket of *jungle*. The wooding place, on the other hand, was a *dry sandy soil*, though standing equally low, and covered with brush-wood, jungle, &c. in the same manner as the other. As the more minute features of the disease are described in the journal, I shall only remark, that it exhibited something of the remittent type, inasmuch as the paroxysms were more conspicuous and violent on alternate days; and on the intermediate, the system seemed less oppressed and more tranquil, with a different cast of features in the countenance; but there never was any thing like an apyrexia. The general treatment adopted in these cases, and which the journal developes, consisted in bloodletting, purging, and exciting ptyalism; the

pre-eminence of which practice, several years experience in this country has amply confirmed. My sentiments have been so often expressed on venesection, that I need not repeat them. With respect to purgatives, I have always observed the greatest relief to follow, when they took full effect. That they are beneficial in every stage of the disease, I infer from this;—that the pulse, from being depressed, weak, and void of energy, becomes open, energetic, and bounding to the surface, with a corresponding animation in the countenance, after copious catharsis, even in the last stage of debility.

The next and only remedy, where bloodletting and purging do not check the disease at once, in its infancy, is mercury to excite ptyalism. I say ptyalism, for *soreness of the mouth* will not secure the patient in this endemic. In many of the *fatal* terminations, the mouth was slightly affected; but we never were able to excite ptyalism. Wherever this last could be induced, a revolution, as it were, in the whole train of morbid symptoms, instantly succeeded, and a healthy train supplied their place! This revolution was most strikingly evinced in the functions of the bowels, by the evacuations becoming, all at once, copious and feculent; a circumstance, which, previous to ptyalism, no purgative, even of the most drastic nature, could effect."

Although the latter part of this document is foreign to the subject for which it was introduced, yet I trust it will be considered interesting. It is satisfactory to me, since it strongly corroborates what I have advanced lately on the treatment of the Bengal endemic, both in respect to bleeding and ptyalism; the former being rather *heterodox* in India. I have only to remark, in reference to the striking coincidence of our practical views, that the above document was never penned for my inspection, nor that of the public. The sensible and well-informed author of it (Mr. Neill) is alive, and can contradict any misrepresentation of his sentiments.

I shall here observe, once for all, that the foregoing remark will equally apply to all other documents and narratives introduced into this Essay, in addition to my own personal observations. They are strictly authentic; being the spontaneous records of facts, commemorated without preconceived theory or preconcerted design. I need not say how much their value is enhanced by this consideration.

In the account of the Batavian endemic, some other striking instances, corroborative of the opinions here advanced, will be related. In the mean time, the above examples will be

sufficient to justify the rules I have laid down, and put future navigators on their guard, where disease and danger lurk in concealment.

And here I cannot help noticing the apathy or impolicy, which still allows Diamond Harbour, the principal anchorage of our Indiamen, to continue backed and flanked by woods, jungles, and marshes, to the annual destruction of one-fourth of the crews of such ships as load and unload at this place! The objection to clearing the Sunderbunds, has been founded on the idea of their presenting an impenetrable barrier to the incursions of an enemy from that quarter; but the Government does not seem to be aware, that to secure us from a *domestic* foe, it is by no means necessary, *in this instance*, to throw open the way to a *foreign*. A semicircle of cleared and drained ground, even of six miles in radius, [not a thirtieth part of the Sunderbunds, and scooped as it were, out of their centre] would sufficiently protect the anchorage and warehouses of Diamond Harbour, from the baleful influence of those exhalations we have been describing.

That the woods and jungles might be cleared, admits of no doubt; and that the country round Diamond Point might either be drained, overflowed, or submitted to the flux and reflux of the tides, any one of which measures would afford comparative security, can hardly be denied. To add to this security, one or two narrow semicircular belts of wood might be interposed between Diamond Harbour and the confines of the cleared space, to arrest any effluvium disengaged from the surrounding wilds or marshes, and conveyed by the breezes towards the aforesaid anchorage. All writers agree, that marsh miasmata, although much less limited in their range than the matter of contagion, would be perfectly harmless after traversing a much shorter route than that proposed; but where native labour can be so easily procured; indeed, where the convicts alone would be equal to the undertaking in a very few years; and finally when it is considered, that this salutary step opens not any facility to the irruption of an enemy on the southern frontier of Bengal, we can hardly doubt that the attention of the Company will, ere long, be directed to so important a measure. Till then, we can only remark, that the farther from shore, and the lower down the river ships lie, so much more healthy will be the crews. On this account Saugur Road is more eligible, in regard to salubrity, than Kedgeree; and the latter much less dangerous than Culpee or Diamond Harbour. This was amply proved by the

comparative mortality in the Caroline, Howe, and Medusa frigates. The two latter, by anchoring higher up than the former, lost at least six times as many men, from fevers and fluxes. Indeed, one was obliged to take a cruise to sea, and the other to retreat back to Saugur Roads, to avoid depopulation! Some suggestions will be given hereafter, in regard to the means of obviating the effects of marsh effluvium, even at Diamond Harbour, the focus of this destructive principle.

In what manner, or through what channel it is conveyed to the sensorium, so as to produce its effects on the constitution, we are nearly ignorant. A general idea prevails, that the stomach is the medium through which the matter of contagion acts; and, by analogy, that marsh miasmata take the same course. But when we consider, that at each inspiration the atmosphere impregnated with this principle is largely applied to the delicate texture of the lungs, it is not difficult to conceive, that it may pass into the blood, [if it is in any case absorbed] as readily as oxygen. There are, besides, the schneiderian, and other membranes of the nares and fauces, to which it must have constant access, while there is but one way for it to pass into the stomach, viz. along with the saliva or food. Further, when we see this principle, in a concentrated state, produce fever in a very few hours, with high delirium, can we suppose that it enters the system by the circuitous route of the alimentary canal and lacteals? If it be said that it acts through the medium of the nerves of the stomach, why not through that of the olfactory, which is a shorter road? Indeed, from a near view of its *effects*, there is every reason to suppose that the brain and nervous system suffer the first impression and shock. To those *effects*, then, we are to direct our attention.

I believe it is nearly an unanimous opinion, at present, that both marsh and human effluvia are directly sedative or debilitating in their nature. Dr. Rush, indeed, uses the term, "stimulus of contagion" in almost every page of his work on Yellow Fever; but, like the more celebrated "stimulus of "necessity," it may be quietly laid in the "tomb of all the Capulets." By Dr. Jackson, the cause of fever is compared to electricity. "It seems to accumulate in the system by a re- "gular but unknown process: in a certain state of accumu- "lation, it seems to explode in a manner similar to the "explosions of electricity."* The delirium and violent action

* Outlines of Fever, p. 247.

early apparent in the jungle fever, might countenance the idea of a stimulus, and that the subsequent debility was of the *indirect* kind. I have heard this opinion maintained on the spot, by medical gentlemen; but if we narrowly inspect the train of morbid symptoms, we find more of *irregular* than *increased* action; more of apparent than real strength. If we carefully observe the delirious patient, writhing and struggling under the first impression of this cause, we find the efforts not only momentary and less effective than healthy exertions, but accompanied, even at the instant, and immediately succeeded by tremor and other marks of debility. The premonitory symptoms too, are all indicative of decreased sensorial energy. The mind is wavering and unsteady; the appetite languid; the secretions, particularly the biliary, diminished; and the bowels torpid. Notwithstanding the determined phraseology of Dr. Rush, therefore, we may still adhere to the opinion of the venerable Cullen, that marsh, as well as human effluvium, is *sedative*. Dr. Jackson, indeed, will not allow it to be either stimulant or sedative, but a kind of *irritant;* yet he gradually slides into the admission of its sedative nature: "It "however appears, from the most general view of things, "that the febrile cause is a cause of irritation, disturbing, "but *not increasing* in a natural manner, the action of the "moving fibre. On the contrary, interrupting, impeding, "and as it were *suspending* the operations essential to health "and life; by which means the expression of its effects "principally consists in *debility and impaired* energy."*

The space of time which intervenes between the application of this poison to the system and its ostensible operation in the form of fever, depends on the degree of its concentration, and the predisposition of the patient. It will, for instance, be found in some places so powerful, that a man in perfect health, by remaining on shore during the night, in marshy situations, and wet or autumnal seasons, shall have the fever violently the next day, and die on the third or fourth. On the other hand, it may be applied in so dilute a state, as to require eighteen, twenty, or even thirty days,† to bring on fever; and even then, perhaps, only in consequence of some of the numerous predisposing or *auxiliary* causes concurring to enable the *original* to develope itself. If we take the medium of these two extremes, we shall have the ordinary

* Outlines of Fever, p. 253.

† Dr. Jackson says two months, and Dr. Bancroft nine or ten.

period, viz. twelve or fourteen days, which elapses between the reception of vegeto-animal miasmata into the body, and their manifestation, in the shape of actual disease.

We see, then, this important agent greatly varying in force; and from standing occasionally the unaided *principal*,—the "instar omnium," in the production of fever, dwindle away till it can scarcely be distinguished, at least not prominently so, among the train of *auxiliaries*.

Such being the case, is it not probable that where the *latter* are numerous or powerful, they may, in some instances, induce the aforesaid disease, without the assistance of marsh exhalation?—See a valuable train of observations on this subject, in the Section on Yellow Fever of the West Indies, in a subsequent part of this work.

PREDISPOSING CAUSES.

We now come to the Predisposing Causes, which are entitled to an equal degree of attention with that which has been bestowed on the remote, or exciting.

These may be divided into mental and corporeal. Of the former, none are so conspicuous as the *depressing passions;* and of these Dr. Clark informs us, that FEAR produced the most striking and sudden effects, in aiding the remote cause of fever. This may, in some measure, account for the ravages which the yellow fever commits among those newly arrived Europeans, who are prepossessed with the idea and dread of this terrible scourge.

I have, indeed, remarked that most of those, who were of a timid disposition, and easily alarmed at the prevalence of the endemic diseases of the country, fell under their influence sooner than those of a contrary temperament. But grief, disappointment, and chagrin were the depressing passions which universally induced the most decided and unequivocal predisposition to disease. I saw many strong and melancholy instances of this among that part of our crew, which we impressed within sight of their own shores, and probably of their own habitations, when we were commencing our voyage to India. They were among the first and worst cases which I had under my care, and afforded ample proofs, that mental despondency can accelerate the attack, and render difficult the cure of intertropical fevers in particular. I have since seen the influence of this predisposing cause on a large scale;—not on the banks of the Ganges, but much nearer home—on the banks of the Scheldt.

When our army lay entrenched under the walls of Flushing, without any other defence from the sun, the rains, and the dews, than some brushwood or straw;—generally, indeed, with the humid earth for their beds, and the canopy of heaven for their curtains; still, with all these disadvantages, the animating prospect of success, the mental energy inspired by *hope*, united with corporeal activity, kept the whole army in health. When Flushing surrendered, however, and another object was not *instantly* held out for pursuit or attainment, a fatal pause took place, and a kind of torpor, or rather ex-

haustion ensued, during which, the remote cause of fever, viz. vegeto-animal miasmata, began to make some impression.—But when from the ramparts of Batz, we clearly discovered with our glasses a strong boom crossing the Scheldt from Fort Lillo,—the surrounding country in a state of inundation, and various other insuperable obstacles between us and the "*ulterior objects*" of the expedition;—then, indeed, the depressing passions, and some other predisposing or exciting causes communicated a fearful activity to marsh effluvium, which rivaled in its effects, any thing that has been seen in tropical climates!

It is an old complaint, that the medical topography, and healthy or unhealthy seasons of a country, are too often neglected in military and naval operations. Yet one would suppose that within sixteen or eighteen hours' communication of London, every medical and political expedient would have been speedily devised and applied, on such an emergency as this. But certain it is, that the army did not avail itself of some local advantages that presented themselves among these noxious islands. Walcheren, for instance, is bounded all the way round from Flushing by West Chapel, nearly to Camp Vere—two-thirds of its circumference, by a chain of sand-hills, from twenty to thirty feet in elevation above the level of the interjacent plains. These hills were not only dry, but open to the westernly winds which blew from the sea, and were then very prevalent. On these, therefore, had the soldiers, who *continued* in Walcheren after the fall of Flushing, been *tented*, the elevated scite, combining with other local peculiarities, would, in all probability, have kept them entirely out of the range of those exhalations which covered the country below.

On the other hand, although Beveland did not present such a favourable situation to the rest of the army, yet, had they been provided with *tents*, the numerous mounds or embankments, which not only defend the island from the highest rise of the Scheldt, but intersect the country in every possible direction, frequently planted on each side with trees, and raised twelve or fourteen feet above the surface of the soil, would have afforded excellent encampments, where the men, under the immediate inspection of their officers, would have been secured from intemperance and other irregularities, the inevitable consequences of being quartered in towns and villages, often in churches, barns, and other damp, unhealthy habitations, throughout Walcheren and Beveland. But, unfortunately, *tents* were not considered a necessary part of the

baggage on this expedition. The French General, too, having opened the sluices, and *partially inundated* the country round Flushing, increased the force of the endemic. Indeed, the road leading from the last-mentioned place to Middleburgh, might at this time vie, in respect to insalubrity, with any throngh the pontine fens of Italy. Lenity towards the *inhabitants* arrested the progress of the inundation before it was complete; policy in guarding the health of *our own army*, would perhaps have suffered it to continue till the cessation of the autumnal heats, and the commencement of cold weather and frost.

Nothing could more clearly prove the limited range of marsh effluvium, than the contrast between the health of the navy and that of the army. Although the ships were distributed all along the shores of Walcheren and Beveland, from Flushing to Batz, most of them within a cable's length of the banks, yet no sickness occurred, except among such parts of the crews as were much employed on shore, and remained there during the nights. Most officers of ships, and many of the men, were in the habit of making excursions through all parts of the islands, by day, with complete immunity from fever. The night was here, as in sultry climates, the period of danger.

One more remark shall close this digression. We all remember the popular, or rather political outcry, that was made about the scarcity of bark: had the lancet, aided by calomel, and occasionally by jalap, been judiciously, but boldly and decisively employed, the physicians of London and Edinburgh would not perhaps, since that period, have been so often consulted for infarctions and obstructions in the liver and spleen, with many other melancholy sequelæ of that destructive fever!

But, to return. One would suppose that, in a tropical climate, where nature is ever arrayed in her gayest livery, the cloudless skies above, and exuberant fertility around, would conspire to impart a degree of elasticity (if I am allowed the term) and exhilaration to the mind, similar to what we feel in Europe, at the approach of spring or summer. The reverse of this is the case. The animal spirits are, in general, below par; and the same cause of grief or disappointment, which in England would be borne with philosophical resignation, or perhaps indifference, will, in India, greatly predispose to all the diseases of the country, and very probably terminate the mortal career of the unhappy object.

The following melancholy facts are strikingly illustrative of this remark. His Majesty's ship Russel (74) sailed from Madras on the 22d. October, 1806, and arrived at Batavia on the 27th November; the crew healthy, and their minds highly elated with the sanguine expectations of surprising the Dutch squadron there. Such, however, was their sudden disappointment, and concomitant mental dejection, on missing the object of their hopes, that they began immediately to fall ill, ten, twelve, or fourteen, per day, till nearly 200 men were laid up with *scurvy*, scorbutic fluxes, and hepatic complaints! Of these, upwards of 30 died before they got back to Bombay, and more than 50 were sent to the hospital there. The Albion did not fare better—the Powerful fared worse: so that, in these three ships only, in the short space of a few months, *full* 100 *men died on board*, and double that number were sent to hospitals, many of whom afterwards fell victims to the diseases specified; aggravated, and in a great measure engendered, by mental despondency.

Numerous are the instances of a similar nature, though on a smaller scale, which I could relate; but the above specimen is sufficient. The converse of this position is equally surprising: thus, success or good fortune will as forcibly counteract, as the contrary will predispose to, the malignant effects of climate. A familiar example will elucidate this.—Two ships, under equal circumstances, sail from Bombay, on a five months' cruise off the Isle of France. One of them takes a valuable prize, while the other, with every effort and vigilance, is quite unsuccessful. The minds of the former crew are now perpetually employed in "building castles in the air," and forming the most extravagant anticipations of enjoyment on their return to port. This ship's company, without the aid of a single bottle of lime-juice, or pot of spruce, will come back to Bombay at the end of the cruise in health. Not so the other: chagrin, envy, (for, after all the *poetical* portraits that are drawn of our noble tars, they are both envious and jealous at times, like other folks) and various depressing passions, shew themselves here, in the ugly shapes of scurvy, ulcers, and fluxes; so that, in spite of all the artificial checks from lemon-juice, sugar, porter, and even NOPAL itself, they are forced to Madagascar for refreshments, or else return with the other ship to Bombay, in a deplorable condition.

Here, however, the scene shifts again; for Hygeia is as fickle as Fortuna. The crew of the successful ship having shared their prize-money,

"Balnea—Vina—Venus,"

become the order of the day; and, for a short time, they are at the summit of human happiness! But in a few weeks, on *leaving* port, this ship's company will exhibit as long a list of fevers, dysenteries, and venereals, as the other did of scurvies, ulcers, and fluxes, on *arriving*. Thus prize-money, or rather the hope of prize-money, is one of the most potent antidotes to disease among sailors at sea, but the most certain bane of their health on shore.

To return. This mental despondency may be attributed partly to physical, and partly to moral causes. I have already hinted that derangements in the *hepatic* and *digestive*, very soon affect the *mental* functions; so, on the other hand, the depressing passions speedily derange the biliary secretion, digestion, and peristaltic motion of the intestines, consequently disposing the liver, stomach, and alimentary canal, to disease, as well as inducing general debility throughout the system. This sufficiently accounts for the phenomenon; but it is also to be considered, that grief and disappointment must be, *ceteris paribus*, more poignant in India than in England; since the loss of friends or relatives is more felt in proportion to the small number we possess; and frustrated expectations will, of course, be more galling on account of the previous sanguine hopes which always accompany a foreign, and particularly an Indian speculation. We may therefore lay it down as an axiom, that in a tropical climate, the depressing passions above alluded to, operate more immediately on those organs which, under all circumstances, are the principal sufferers in the diseases of the country; viz. that they diminish the mental energies, or sensorial power, and impair the functions of the liver, stomach, and intestinal canal.

Withiu the torrid zone, philosophy seems to direct her influence, and reason its arguments, in vain, against these powerful disorders of the mind! Their frigid tenets are more efficacious beneath the gloomy skies of Europe. Religion, indeed, frequently asserts her superiority here, as well as elsewhere; and in conjunction with some pursuit or employment, mental or corporeal, will be found the best shield against the demon of despair, and, ultimately, the pangs of disease.

The destructive effects of intemperance, as a predisposing cause, are equally conspicuous, and I might say peculiar, in a tropical climate; for the injuries it occasions in Europe, great as they are, bear no proportion to those which we witness in the East or West Indies. Whether spirituous aud vinous potations act as stimulants or sedatives, or both in succession,

we need not stop to enquire, since the final result is universally allowed to be debility. From the temporary increase of excitement in the system, and energy in the circulation, it is not impossible that the biliary secretion is for a short time augmented, and of course vitiated, by strong drink. This supposition is strengthened by the diarrhœa crapulosa which we frequently observe succeeding a debauch. But the great mischief seems to arise from the torpor communicated to the liver, through paralysis of its ducts, by which the secretion of healthy bile is not only greatly diminished in quantity, as well as obstructed, but deteriorated in quality; and hence the way is paved for fever, dysentery, and hepatitis.

The debility of the stomach, too, occasioned by the climate, is further increased by inebriety; and this atony is readily communicated to the liver, which bears the onus of disease in all hot climates.

The truth of these observations is amply exemplified among the crews of ships, when they have liberty to spend a few days at Calcutta, or go ashore, indeed, in any part of India, where intoxicating liquors are to be procured. During the indirect debility succeeding these debauches, the endemic of the country or port makes rapid strides among these deluded victims, converting what they erroneously conceived an indulgence, into the greatest evil that could have befallen them.

For obvious reasons, intemperance in eating is little less destructive than the other species; since an overloaded stomach, which has previously been weakened, will of itself excite a temporary fever, and consequently predispose to that of the country.

That fatigue, especially during the heat of the day, becomes an exciting cause of this fever, is well known to those who have observed its effects among the seamen employed in stowing the saltpetre, or loading and unloading the company's ships at Diamond Harbour. Where those laborious occupations *must* be carried on by Europeans, they certainly should not take place between eleven o'clock and four in the afternoon; the interval ought to be dedicated to dinner, rest, and light work under the awnings.

A very common, and powerfully predisposing cause of this fever, has seldom been adverted to, though highly deserving of attention—I mean those licentious indulgences which are but too easily procured, and too frequently practised on the banks of the Ganges, and in most other parts of India—I may say of all tropical climates! I have seen many melancholy

instances of their pernicious effects; and therefore it is incumbent on commanding officers of ships, to keep as strict a curb as possible on the men, during the sickly season, and on no account whatever allow them to straggle through the villages, where inebriety, and that too from a very deleterious species of drink, is an inseparable accompaniment to the illicit amours abovementioned. In every region virtue is its own reward; but within the torrid zone, its breach is more signally punished than in any other.

The last predisposing cause which I shall mention, is the influence of the sun and moon. However sceptical professional men in Europe may be, in regard to planetary influence in fevers, &c. it is too plainly perceptible between the tropics, to admit of a doubt. I have not only observed it in others, but felt it in my own person in India, when labouring under the effects of obstructed liver.

It is a certain fact, that if we attend minutely to the state of our own frames and sensations, two, if not three slight febrile paroxysms, may be detected in the course of each diurnal revolution of the earth, independent of those which succeed full meals. In high health we may not be able to distinguish more than the nocturnal paroxysm, which commences about seven or eight o'clock in the evening, and is not over till two in the morning. This is the cause of that furred tongue, which all may observe on getting out of bed, more or less, according to the degree of the paroxysm; and it likewise explains the evening exacerbation of fevers in general. But valetudinarians will feel, about mid-day, another slight febrile accession, similar to the preceding, except in degree; and in some instances a third, but still slighter one, is felt between eight and ten o'clock in the morning. In India I have felt the two former very distinctly, and particularly at full and change, when I used to be affected with tremor, a sense of weakness, and sometimes a dimness of vision about mid-day, succeeded by a certain quickness and irritability of pulse, which would continue for an hour or two. I was so well aware of this, that I made a point of keeping myself quiet, and as cool as possible, about the abovementioned period; since any exertion at that time, in the heat of the sun especially, increased the symptoms which I have described, in a very considerable degree. I believe this is the case with most people, more or less, and accounts for the general complaint of faintness about twelve o'clock in the day, and which is relieved by a glass of wine or other refreshment. I found the

cold bath, where I could conveniently apply it, almost entirely *prevent* this paroxysm, and hence the utility of bathing when the sun is at his greatest altitude. At those times too, my sleep was broken and disturbed with dreams, and a feverish heat towards midnight, all of which would go off about two o'clock in the morning. This accords with the general remark, that the morning repose is the soundest, and that if dreams do then occur, they are more distinct and better remembered than those which take place *during* the nocturnal paroxysm. It is very natnral to attribute such regular and periodical changes or feelings in the human frame, to the revolutions of the planet we inhabit, and the influence of the sun and moon. That this influence predisposes to, or exacerbates the paroxysms of fever, in India and other tropical climates, is incontestibly proved by daily observation, as the publications of the ingenious and respectable Dr. Balfour evince.

The difference between this and the yellow fever of the West has been always noticed, but, in my opinion, never adequately accounted for; and the investigation of this discordance is certainly interesting, since the same general causes, both remote and predisposing, are allowed to operate equally or nearly so, in both hemispheres. First, then, let me observe, that the average space which a ship traverses, between Spithead and the Ganges, is 14,000 miles. Secondly, that in this voyage we run twice through the tropics; first from Cancer to Capricorn, and afterwards from Capricorn back to Cancer again; besides a great deal of oblique sailing in the vicinity of the southern tropic. During the period of time necessary for this performance, the human frame has the best possible means of accommodating itself to the change of climate; viz. a more steady range of temperature, and of a lower degree, than that of the ultimate destination; together with an atmosphere untainted by any noxious exhalation. In addition to these, the regular hours imposed on all classes, in ships proceeding eastward, the consequent habits of temperance acquired, and lastly, the paucity of luxuries which pretty generally attends a protracted voyage, especially the last weeks, sometimes months of it, all combine to lower the tone of the constitution, and impart to it a considerable degree of assimilation, before the period of danger arrives. Thus the stomach and bowels will become somewhat accustomed to the increased secretion of bile, and even this last will be less profuse, as we are more inured to the high ranges of temperature, following the same laws, and sympathising with the perspiration.

Let us contrast this with a transatlantic voyage. The European, "full of flesh and blood," [to use a vulgar, but not inapplicable expression] embarks for the West Indies, in a transport or other vessel, where regularity and order are by no means conspicuous.* As he is under little control, and generally supplies a great proportion of his own fare, he endeavours to guard against any deficiency in that important point; in short, good English viands smoke daily on the festive board, while sufficient potation—"to keep the pores open," is steadily applied; till, after a few weeks run, he is launched at once into a tropical climate, and immediately landed, "with all his imperfections on his head." It is true that, when ashore, the facility of procuring the "*diffusible stimuli*" need not be much insisted on, since, unfortunately, the *arrack* of the east is equally easy of access to the men, as the *rum* of the west. But unquestionably the bad effects will be greater in the latter case, for the reasons adduced above.

With respect to officers, and other genteel classes of society, on landing in the western world, they are destitute of many powerful shields which are pretty generally interposed between Europeans of the East and the burning climate. In the former case, we may look in vain for the palankeen, the budgerow, the punka, the tatty, and the light, elegant, and cool vestments of India, together with the numerous retinue of domestics, anticipating every wish, and performing every office, that may save the exertion of their employers. The untravelled cynic may designate these luxuries by the contemptuous epithet of "Asiatic effeminacy;" but the medical philospher will be disposed to regard them as rational enjoyments, or rather as salutary precautions, rendered necessary by the great difference between a temperate and torrid zone. Nor are these *dulcia vitæ* the exclusive property of the higher classes in India. The European soldier is permitted to intermarry with the native Hindostannee nymph; and, whether married or not, he has generally a domiciliated *chere amie*, who cooks, washes, and performs every menial drudgery for *massa*, in health, besides becoming an invaluable nurse when he is overtaken by sickness.

Under the privation of these advantages, can we wonder at the effects, which exposure to all those causes, described as operating in Bengal, must produce on the full, plethoric

* I allude principally to troops.

habit of an Englishman, only four or five weeks from his native skies, before he debarks on the burning shores, or insalubrious swamps and vallies of our western colonies.

The more prominent distinctive features of the transatlantic fever, yellow skin and black vomit, [though by the bye they are frequently *absent* in this, and *present* in the eastern fever], may I think be attributed to the more violent action in the hepatic system, and superabundant secretion of *vitiated* bile, which, by the ceaseless vomiting, is thrown out in deluges on the duodenum and stomach, deranging their structure, while regurgitation into the blood suffuses the skin. "On the "first and second days of the disorder," says Dr. Rush, "many patients puked from half a pint to nearly a quart, of "green or yellow bile. Four cases came under my notice, "in which black bile was discharged on the *first* day. Three "of these cases recovered. I ascribed their recovery to the "bile not having yet acquired acrimony enough to *inflame or* "*corrode the stomach.* There was frequently, on the fourth "or fifth day, a discharge of matter from the stomach, like "the grounds of coffee. I believed it first to be a modifica- "tion of *vitiated bile,* but I was led afterwards to *suspect* "that it was produced by a *morbid secretion in the liver,* and "effused from it into the stomach."——"That the bile may "become extremely acrid in this stage of the disorder, is "evident from several observations and experiments. Dr. "Physick's hand was *inflamed* in consequence of its being "*wetted* by bile in this state, in dissecting a body,." p. 54. "I am not certain that the black matter which was discharged "in the *last stage* of the disorder was *always* vitiated or acrid "bile. It was probably, in *some cases,* the matter which "was formed in consequence of the mortification of the sto- "mach." p. 55.

In respect to the yellow colour, Dr. Rush is fully convinced that it is attributable to bile. "From these facts it is evident," says he, "that the yellowness, *in all cases,* was the "effect of an absorption and mixture of the bile with the "blood." p. 70.—*Vide Hunter and Bancroft.*

It is not meant to infer from hence, that the febrific miasms are exactly the same in the East and in the West; experience proves the contrary, as will be shewn in the Section on Batavian Endemic. I only mean to say, that the expression of their effects, on the biliary organs in particular, may be considerably modified by the circumstances above detailed. Neither do I suppose that in the last stages of black vomit,

the matter ejected is bilious; but I am confident that the gastric derangement is in a great measure occasioned by the deluges of acrid, vitiated bile, poured from the liver on the stomach, during the vomiting in the early stages of the disease.* Hence, to check the gastric irritability early, is a most desirable object.

The stomachs of newly arrived Europeans in the West will, for the reasons detailed above, be much more liable also to take on inflammatory action. This, and the more violent orgasm in the hepatic system, appear to be the principal distinctive features in which the fevers of the two hemispheres differ; and are, I think, referible to the aforesaid causes. These considerations also account for the more decisive system of depletion which is necessary in the western endemic; and for the inutility of mercury till the inflammatory action is completely controlled. In the Eastern Hemisphere, on the other hand, where the biliary apparatus is very generally in a state of derangement anterior to febrile attacks, the union of mercury with venesection is a rational measure.

In respect to the *yellow colour*, in the highly concentrated endemic fever of the western world, there is reason to doubt its cause being a simply *bilious* suffusion. It would almost appear to be a broken down state of the blood—or a stagnation in the capillary system, such as we see after contusions.

A practical point of much importance remains to be noticed; namely, whether or not the fevers in question are contagious. It is lamentable to observe the discordance of medical opinions on a question that, at first sight, might seem so easily determined. Thus, Clarke, Lind, Balfour, Chisholm, Blane, and Pym, are positive in the affirmative; while, on the other hand, Hunter, Jackson, Moseley, Miller, Bancroft, and Burnett, are as decided in the negative!

Yet here, as in most other instances, truth lies between the extremes. As far as my own observations and judgment could guide me, I have been led to conclude, that the endemic fevers alluded to are *not* contagious, till a certain number of patients are confined together, under peculiar circumstances, when the effluvia *may* render them so. If, for instance, a man is seized with fever, from greater predis-

* The above observations are confirmed by the dissections of Dr. Ramsay, at Bellevue Hospital, in 1803. (Vide Edinb. Med. and Surg. Jour. No. xxxii, page 423.) He traced, in numerous instances, the *black vomit* to the gall-bladder and hepatic ducts; and to this acrid discharge he attributes, in a great degree, the derangement in the stomach and bowels, which gives rise to the *bloody vomit* subsequently.

position, or from greater exposure to the causes enumerated, than his companions, he will not communicate the disease to another, who may sleep even in the same chamber, where common cleanliness is observed. But on the other hand, if great numbers are attacked, nearly at the same time, and confined in the sick berth of a ship, or ill ventilated apartments, in hammocks, cots, or filthy beds, it is possible that a contagious atmosphere may be formed, [without an attention to cleanliness and ventilation scarcely compatible, or at least hardly to be expected, in such situations,] which spreads a disease, *wearing the livery of the prevailing endemic*, but having a dangerous character superadded, namely, the power of reproducing itself in other subjects, both independent of, and in conjunction with, the original endemical causes.* This circumstance reconciles the jarring evidences which have long kept the public opinion in suspense. It has been urged, that we ought to err on the safe side, by considering it contagious, and guarding accordingly by early separation. But this plan is not without its disadvantages, and, if I am not greatly mistaken, I have seen it produce what it was meant to prevent; viz. by confining all who had any symptoms of the fever in one place; where, as on board a ship in a tropical, or any climate, it is exceedingly difficult, if not impossible, to prevent the generation of an infectious atmosphere, and the impregnation of bed-clothes, &c. with the effluvia from the diseased secretions and excretions of the patients. On the other hand, I have seen both sides of the main deck nearly filled with fevers of the country, where screens and other means of separation could not be obtained, or rather, were not insisted on, and yet no bad effects followed; while under similar circumstances, where there were fewer sick, and all imaginable pains taken to insulate them, attendants have been seized, and other symptoms, indicative of contagion and virulence, have arisen, which, while they seemed fully to justify the precautions used, were probably owing to them alone. These hints may not be entirely unworthy of attention, inasmuch as they shew us how easily we may be deceived, and how positive we may be in our errors. They likewise shew that free ventilation and cleanliness may in general be confided in, between the tropics, where seclusion is inconvenient or impracticable; and that *separation of the sick from one another*, as far as possible, is a

* Vide the Section on bilious fever, and also what has been said respecting the Corunna fever in the preceding Section.

duty not less incumbent, than that of cutting off the communication between them and the healthy. There is this advantage attending the former, that alarm is in a great measure hushed, and the depressing passion of fear so far obviated.

Before taking leave of this fever, it will be necessary to say a few words respecting—

INTERMITTENTS.

In those parts of India and China bordering on the Northern tropic, when the sun is in Capricorn, and the cool season sets in, viz. from the middle of November, till the middle or latter end of February, fevers change from the remittent to the intermittent form. Thus at Bombay, Calcutta, and Canton, particularly the last-mentioned place, we have ample specimens during the above period, of agues and fluxes. From the Bocca tigris up to Canton, the river is flanked with extensive paddy grounds intersected and watered in all directions by the minor branches of the Taa and artificial canals. The surrounding country, however, is singularly mountainous; and at this season, has a dreary, wild, and bleak appearance. From these mountains the north-east monsoon comes down with a piercing coldness, which the Europeans, relaxed and debilitated by the previous heats, or their sojourn on the sultry coasts of Hindostan, are quite unable to resist. As the improvident mariner has seldom any European clothing in reserve, adapted to this unexpected exigency, especially if he has been any time in India, we need not wonder that in such circumstances, a great number should be afflicted with intermittents and dysenteries at this season. For many weeks, we had seldom fewer than thirty or forty, often more at one time, laid up with these complaints: they were generally tertians with a few quartans. The apyrexia was tolerably clear, and the bark exhibited in the usual way recommended for similar fevers in Europe, was a certain and expeditious cure, where no visceral obstructions existed. In the latter case, which was but too frequent, mercury, of course, was an essential auxiliary. It is proper to remark, that in two ships of war lying at the Bocca tigris, [the Grampus and Caroline] the bark was entirely expended on the great number of intermit-

tents. In this dilemma we had no other resource than mercury; and this medicine invariably stopt the paroxysms as soon as the system was saturated; but it must not be concealed, that three-fourths of our patients, treated on this plan, relapsed as soon as the effects of the mercury had worn off, and this after three, and in a few instances, four successive administrations, so as to excite ptyalism. I attributed these failures to the coldness and rawness of the air, together with the want of proper clothing and defence against this sudden transition from a hot to a comparatively cold climate; very unfavourable circumstances in the mercurial treatment. No ill effects, however, resulted.

In the month of October the weather was so warm, and the nights so cloudless and serene, with very little dew, that many of us slept in the open air at Lintin, an island about twenty-five miles above Macao, where we had tents ashore for the sick and convalescents, as well as the different working parties.

But in November the nights became exceedingly cold; and although there was hardly any thing that could be called a swamp or marsh on the island, yet intermittents and fluxes made their appearance, and continued to increase during our stay, without any very apparent cause, except this sudden vicissitude in the temperature of the air.

There was indeed a very high peak in the centre of the island, the sides of which were covered with thick grass-jungle, and over this the winds blew towards the ship and tents. There can be no doubt that hills and mountains arrest the course of marsh miasmata through the air, and when a sufficient quantum of these is collected, they will produce their effects on the human frame, in a similar manner, as if issuing from their original source; especially when the predisposing causes are in great force. Hence we see how miasmal fevers may take place on the summit of *Morne fortune*, or the rock of *Gibraltar*, without any necessity for the supposition that the febrific exhalation arose from those places themselves. We next moved up to the Bocca tigris, and got into the vicinity of extensive marshy and paddy grounds, which contributed greatly to the augmentation of the sick list.

It is somewhat curious, that a frigate [the Dedaigneuse] belonging to the squadron, which lay in the typa, near the city of Macao, remained perfectly healthy, while we were so afflicted with the diseases above-mentioned. As the crew

of this ship was exposed to all the causes, *predisposing and exciting*, which could exist farther up the river, it follows, that marsh exhalation must have been here, as elsewhere, the fundamental *remote cause*, that gave origin to the intermittents. At Wampoa, sickness was still more predominant among the Indiamen, than at the Bogue—not so much from any great difference in the medical topography of the two places, as from the vicinity of the former to Canton, to which city parties of the last-mentioned ships' crews were in the habit of repairing on leave, to the no small detriment of their health, from the course of intemperance pretty generally pursued. The great intercourse, likewise, between Wampoa and Canton afforded infinite facility to the introduction of inebriating materials among those who remained on board. The liquor retailed to seamen in China is certainly of a very destructive nature. Its effects have attracted so much attention, that when His Majesty's ships are leaving the coasts of India for China, there is generally an order received from the Admiral, enjoining the officers to guard as much as possible against the introduction of "SAMSOO" among the crews, which, says the order, "is found to be poison to the human frame."—It were a consummation devoutly to be wished, could this injunction be extended to the arrac of India, from which the samsoo only differs in being more impregnated with certain stimulating materials, prejudicial to the stomach and bowels.

The ordinary mode of preparing Samsoo is as follows:—"The rice is kept in hot water till the grains are swollen; it is then mixed up with water, in which has been dissolved a preparation called '*Pe-ka*,' consisting of rice-flour, liquorice-root, anniseed, and garlic. This hastens fermentation, and imparts to the liquor a peculiar flavour." It is probable, however, that other more active ingredients are added to that in use among the lower classes at Canton. Bontius, speaking of the dysentery at Batavia, alleges, as "the principal "cause of this disease, the drinking an inflammatory liquor "called *arrac*, which the *Chinese* make of rice, and the "*holothuria*, or what is called quabbin in Holland. These "holothuria have so *pungent* a heat, that the touch of them "*ulcerates* the skin and raises vesicles." p. 16. He adds a pathetic remark. "Happy were it for our sailors, that they "drank more moderately of this liquor; the plains of India "would not then be protuberant with the innumerable "graves of the dead!" The same remark might be with

strict propriety applied to the arrac of India in general, where, as at Bombay for instance, its pernicious effects are equally conspicuous as at Batavia.

It may at first sight appear singular, that mountainous countries covered with lofty woods, or thick jungles, should give rise to fevers, similar in every respect to those of flat and marshy districts. But the reason is obvious, when we consider that in the first-mentioned situations the surface of the earth is constantly strewed, particularly in autumn, with vegeto-animal remains, and kept in a moist state by the rains, or drippings of dews from the superincumbent foliage. The stratum of atmosphere, therefore, in contact with the ground, becomes highly impregnated with effluvia, which are seldom agitated by breezes, or rarefied by the rays of the sun; either of which would tend to dissipate the exhalations. Thus, among the lofty forests and impenetrable jungles of Ceylon, the most powerful miasmata are engendered, producing fevers of great violence and danger. "It is under the branches of "these shrubs," [in Ceylon] says Lord Valentia, "that the "fatal jungle fever is probably generated. Not a breath of "air can pass through; and the confined exhalations from "the black vegetable mud, loaded with putrid effluvia of all "kinds, must acquire a highly deleterious quality, affecting "both the air and the water." *Travels, vol.* 2.

Generally speaking, however, these hill, or jungle fevers, as they are locally designated, appear in the form of intermittents, especially among the natives, and those Europeans, whose constitutions are assimilated to the climate. Unfortunately, among the latter class these fevers either soon produce, or are accompanied by, visceral obstructions, too frequently terminating in confirmed hepatitis; hence the necessity of checking them as soon as possible, and of using all imaginable precaution in guarding against the remote and predisposing causes. The treatment, of course, must vary, from a simple administration of bark, to its combination with mercury, or the exhibition of the latter alone, so as to keep up a gentle ptyalism for some considerable time. In these elevated situations, far from seas, or even rivers, and entirely out of the reach of tides, the influence of the moon is unequivocally evinced.

"It is by no means uncommon," says Captain Williamson, "to see persons, especially Europeans, who have to "appearance been cured of jungle or hill fevers, as they are "called, and which correspond exactly with our marsh

" fever, laid up at either the full or change of the moon, or " possibly at both, for years after." This from a non-professional gentleman, is another proof of the sandy foundation on which Dr. Lind's hypothesis, before alluded to, rests; and of the truth of Dr. Balfour's observations.

Analytical Review of a Medical Report on the Epidemic Fever of Coimbatore, &c.—By Drs. Ainsly, Smith, and Christie.

SEC. III.—An epidemic, spreading its ravages from Cape Comorin to the Banks of the Cavery—from the Ghauts to the coast of Coromandel, and sweeping to the grave 106,789 persons, presented a noble field for investigation—an unbounded theatre for the acquisition of medical knowledge! But, alas! the richness of the soil seems only to have rendered indolent the cultivator; and a miserable stunted harvest has been gathered from the most luxuriant plains and vallies on which the sun of science ever shone!

1. *Causes.*—Since the time of Hippocrates, *atmospheric vicissitudes* have been deemed insalutary; and Hoffman set them down as the general remote cause of epidemic fever.—The committee believe that Sydenham's " *Secret Constitution of the Air*" is as good an explanation as can be given. We believe not; but shall not stop here to discuss the point. They, justly, however, remark, that an erroneous opinion has prevailed, that marsh miasmata can only be engendered in low swampy situations, " though it is well known that noxious vapours from woods, especially if thick and ill ventilated, are as certainly a source of the same mischief." This second source was very abundant in several of the ravaged provinces, many parts being so covered with wood, jungle, and rank vegetation, as to be nearly impervious. Another supposed origin of febrific miasmata was in the salt marshes found in the Tinnevelly and Ramnad districts, where the fever raged with uncommon severity. The committee are of opinion, that marshy situations are not sufficient to render fevers epidemic; there is required the super-agency of a close, moist, and sultry heat, with imperfect ventilation. Such an offensive condition of the atmosphere was but too often ex-

perienced in several of the low tracts of these districts during the sickly season, and was pregnant with the most baleful consequences. Although great deviations from the natural order of climate are, fortunately, not very frequent in these regions, yet, as in the present instance, they do sometimes take place; and are always followed by disastrous results. Major Orme informs us, that in the month of March the S.W. monsoon broke completely over the western Ghauts, and descended in vast floods over the Coromandel side of the Peninsula, destroying crops just ready to be cut, sweeping away many of the inhabitants, and ultimately, by creating a powerful evaporation during a sultry heat, producing an epidemic disease very fatal in its consequences.

The effects of those miasmata engendered amongst woods and jungles have been too well authenticated to require additional testimony. As electricity has been said to promote putrefaction in animal bodies, the committee query how far this fluid, which was very abundant in the atmosphere during the sickly seasons, may not have assisted in producing a distempered state of the air. We think this is a very questionable cause of epidemia.

The predisposing causes of remittent and intermittent fevers are well known to be those which operate by producing debility, as bad diet, fatigue, exposure to cold and damp, grief, mental anxiety, &c. This is illustrated by a remarkable exemption from disease, among the troops stationed at Madura, while the poor inhabitants of the garrison were swept off by sickness. The same was observed at Dindigul, where two deaths only occurred among three companies of troops, while the needy inhabitants of the town were dying by hundreds.

Of the *exciting* causes, the committee considered exposure to cold and damp, while the body had been relaxed by preceding heat, and the solar influence, as the most powerful.

"The heat of the early part of the nights, induced many of the natives to sleep in the open air, by which means they became exposed, while yet perspiring, to the chill fogs and damps of the morning." P. 116.

2. *Nature and Types of the Epidemic.*—This fatal fever did not differ essentially from the common endemic of the country. Its epidemic tendency, on the present occasion, was altogether ascribable to the *causes* enumerated in the preceding section. It is either remittent or intermittent, according to the constitution, treatment, and season of the

year. People by nature delicate and irritable, or rendered so by irregularities, or want of care, are sometimes attacked by the disease in the remittent form, proving bilious or nervous, as the constitution inclines. The same happens to the more robust, when improperly treated, as where bark is given early, and before proper evacuations have been premised. As the season becomes hotter, too, the remitting form prevails over the intermittent. Males suffered more than females, and young people and those of middle-age more than old people and children. The remittent form sometimes makes its approaches very insidiously. The patient feels himself out of sorts for a few days; his appetite fails him; he has squeamishness, especially at the sight of animal food; universal lassitude; alternate heats and chills; stupid heaviness, if not pain in the head. The eyes are clouded; the ears ring; the bowels are invariably costive. In other cases, the enemy approaches rapidly; and rigors, great prostration of strength, vertigo, nausea, or vomiting, usher in the disease.

The first paroxysm, which is often attended with delirium and epistaxis, after continuing an indefinite period, with varying symptoms, terminates in a sweat; not profuse and fluent, as after a regular hot fit of ague, but clammy and partial, with the effect, however, of lowering the pulse, and cooling the body, but not to the natural standard. The latter still feels dry and uncomfortable; the pulse continuing smaller and quicker than it ought. This remission will not be of long standing, without proper remedial measures. A more severe paroxysm soon ensues, ushered in by vomiting (sometimes of bile), and quickly followed by excessive heat; delirium; great thirst; difficult respiration; febrile anxiety; parched and brownish tongue. The next remission (if it do take place), is less perfect than the first, and brings still less relief. In this way, if medicine, or a spontaneous purging do not check the disease, it will run its fatal course, each succeeding attack proving worse than its predecessor, till exhausted nature begins to give way. The pulse declines; the countenance shrinks, and looks sallow; the eyes become dim; "*the abdomen swells from visceral congestion*;" the stomach loathes all food, when hiccup, stupor, and low delirium usher in death. Such severe cases, the committee think, were, in general, owing to neglect or blunders at the beginning of the disease.

Intermittents were more intractable, as well as more common. The epidemic was void of any contagious character, except in cases that were allowed to run into the low continued form; and even here, the contagion was circumscribed within very narrow limits. The types were, the simple tertian, the double tertian, the quotidian, the quartan, and the irregular. The following will give some idea of the relative numbers of these forms.—A native detachment at Dindigul, 255 strong, suffered in the following proportion: simp. tert. 30; doub. tert. 26; irreg. 24; quotid. 13; quart. 4. The quotidian form was well marked, returning at nearly equal periods, often attacking weak constitutions, and leaving but little time for taking the bark. It was more apt to occasion visceral obstructions and œdematous swellings than any other form of the disease. The quartan was rare, but obstinate, and frequently productive of splenic obstruction and dropsy. The irregular was very troublesome, and seemed to correspond with Hoffman's semi-tertian.

The Tamool, or native practitioners, ascribe the epidemic fever chiefly to two causes—a superabundance of moisture in the air and earth, and the bad quality of the water, owing to unwholesome solutions. We think there is much truth in their opinions, and have had reason to believe ourselves, that the water, as well as the air, becomes impregnated with morbific miasmata.

Treatment.—On the first appearance of the epidemic, no time was lost in clearing out the bowels by brisk purgatives; and soon after the medicine had ceased to operate, the cinchona was prescribed, observing this rule respecting it, that, the nearer the time of giving the last dose of bark for the day is brought to the period of attack of the cold stage, the more likely will it be to accomplish the purpose intended.—From six to eight drachms of the fresh powdered bark, taken in substance, was commonly sufficient to keep off a fit, especially if given in the four or five hours preceding the paroxysm. Some of the native stomachs could not bear the powder, unless mixed with ginger, or given in infusion or decoction, with tinct. cinchonæ, and conf. aromat. As the bark sometimes constipated, a few grains of rhubarb were added, or laxative glysters used. Thirty or forty drops of laudanum, with half an ounce of the acetate of ammonia, given at the commencement of the hot fit, often had the effect of shortening it, sustaining the strength, and rendering the stomach retentive.

When the perspiration begins to flow, the drink ought to be tepid; but when the body is hot and the skin dry, cold water is both grateful and salutary. The bark must be continued for some time after the fever disappears, to prevent recurrence. The committee, as was to be expected from the schools of debility and putrescency in which they were educated, declaim against purgatives in this fever, "lest they be "productive of mischief, by occasioning irritation, *debility*, "and ultimately an obstinate disease—*mindful of the lesson* "*that was taught them in early life*, by the writings of the "judicious Hoffman." &c. We quote this passage, not to say that we think drastic purgatives necessary in the simple form of intermittent, for we know that they are *unnecessary*, and sometimes hurtful; but to shew that the committee were genuine disciples of Hoffman and of Spasm; and consequently, that we are not to look for any thing beyond the spell-bound circle of these fallacious theories!

When the fever, as too often happened, ran its course some days unchecked by medicine, then the case was altered, for abdominal congestion and visceral obstruction soon took place, and a dangerous state of the disease was induced. In these distressing circumstances, change of climate was necessary, and a course of calomel. When the mouth became affected, some of the most unpleasant symptoms disappeared, and then the bark was administered with more safety.

The committee not unfrequently met with obstinate intermittents, unaccompanied apparently by visceral obstruction, in which bark was unavailing. They sometimes tried with success sulphuric æther in doses of one drachm and a half, taken at the approach of the cold fit; and also full doses of laudanum. The sulphate of zinc did not answer. The Hindoo practitioners have used arsenic in intermittent fevers time immemorial, and entertain a high opinion of its virtues; but the committee do not approve of it much, though it sometimes succeeded when all other remedies had failed. The cold affusion was useful in the hot fits; nay, daily immersion in the sea sometimes proved the happy means of checking agues which had baffled every other exertion. A blister to the nape of the neck will sometimes check the recurrence of the cold fit. A full dose of the *tinct. rhei et aloes*, at bed-time, was found by Mr. Tait, of Trichinopoly, to stop agues that resisted every other remedy. Notwithstanding all our endeavours, the disease will sometimes run on to coma and death.

"In such cases, calomel or the blue pill, continued till the mouth is a little affected, *even when no obstruction has taken place,* is *often* found to be of the greatest service." 145.

On this we shall make no comment; the fact speaks for itself. Alarming bowel complaints sometimes supervene on long-protracted intermittents; not attended with much straining, but of an obstinate and debilitating nature, requiring opiates, weak cretaceous mixtures, and aromatics. They too often prove fatal, especially among the natives.

Œdematous swellings and ascites not unfrequently supervene from pure debility. These, where no visceral obstruction prevailed, were best treated by tincture of squills, ginger, and tinct. cinchonæ, together with frequent friction with dry flannel, and proper attention to the ingesta. But when the bowels were firm, and there was any suspicion of organic derangement in the abdomen, calomel in small doses was conjoined with the squills; or what answered better, the pilula hydrargyri.

This fever coming on patients who had previously suffered from liver affections or dysentery, assumed an alarming and complex form, requiring the nicest management Bark was here to be used with great caution. Even the infusion and decoction were dangerous, where there was any pain or uneasiness in the right side. A blister, without loss of time, was then applied, and mercury had recourse to.—R. Pil. hydrargyri gr. vj; pulv. ipecac. gr. iij. opii. gr. ſs; fiant pilulæ tres. Sumatur una ter die; resuming the use of the cinchona as the hepatic symptoms subside. Sometimes the two remedies were combined, where the hepatic affection was chronic and not very obtrusive. An issue in the right side, with bitters and tonics, often proved serviceable. Change of air was superior to all other means, and diet of course required constant attention. Gentle exercise; flannel next the skin, especially where hepatic affections existed; and the most scrupulous attention to the state of the bowels.

When, from the appearance of the symptoms, a fever of the remittent kind is approaching, emetics are improper; in this case, the committee recommended six grains of calomel and six of James's powder, to be taken in the course of 12 hours, which will generally produce copious evacuations, and sometimes diaphoresis.

"On the second day, when the paroxysm will, in many cases, be found every way more severe than on the first, no time is to be lost in having recourse to mercury, *the remedy which, at such times, can best be relied on for producing a*

proper intermission. Seven or eight grains of calomel, with three grains of camphor, are to be well rubbed together, and made into four pills, one of which is to be taken every three hours during the day. These will often have the desired effect, if continued for two or three days, by producing a desirable change in the habit, and so favourable a remission, that the bark may be given with safety." 154.

If this be not a decisive evidence in favour of the *anti-febrile* powers of mercury on the constitution, we know not what evidence would carry conviction to the minds of the declaimers against that medicine. It is the more satisfactory, as it comes from the anti-mercurial party themselves, surrounded with the prejudices of debility and putrescency.

The principal native remedies employed by the Tamool practitioners were, white arsenic, about the 15th part of a grain, twice a day; the barks of the Swietenia febrifuga and melia Azadirachta; the Catcaranja nut; the Chukkoo (Amom. Zingib.); the Sison Ammi; bark of the Acacia Arabica, and Tellicherry bark.

While we deplore the want of that enthusiasm which, from such an ample field for observation, would have drawn copious stores of invaluable knowledge, we must still allow, that the report of this committee contains much important matter that may prove food for useful reflection.

We have lately heard it urged, that the causes of intermittent and remittent fevers must necessarily be sought in low and marshy situations; whereas the testimony of unquestionable writers, and this document particularly, proves, that febrific miasmata may rise, under certain conditions, from almost any soil; and what is still more extraordinary, that these febrific miasmata may be carried, by currents of air, to a distance far exceeding what has been laid down by some most respectable writers on the subject. This epidemic of India spread its poisonous breath from South to North, in the direction of the monsoon, and was confidently believed by the natives to have its sources in the Pylney mountains, whose overgrown woods, unventilated vallies, and stagnant marshes, could not fail to engender a more rapidly dangerous condition of the atmosphere, than that brought about by the same general causes on the drier and less woody plains of the eastern ranges of the Peninsula.

The observations of the committee are corroborated by the testimony of others, particularly Zimmerman and Jackson.

" Fevers of this sort (says the latter) arise in particular countries, or districts of a country. They travel in certain tracts: sometimes confined to narrow bounds; at other times they are more widely diffused."—*Medical Dep. Brit. Army, p.* 212. *See also Zimmerman's* " *Experience,*" *vol. ii. p.* 155.

It is greatly to be lamented, that some of the *energetic* modes of treatment lately introduced into the *methodus medendi* of fever had not been tried in the remittent forms of the eastern epidemic. It does not appear that a lancet was wet in any part of the epidemic range from Cape Comorin to the Cavery; and therefore it is in vain for our Oriental brethren to say that it would not have been useful, when they never gave it a trial. The evidence, however, in favour of MERCURY is most unequivocal, and will probably silence, if any thing can, the clamour which has been raised against it in this country.

Observations on the Fever prevalent in the province of Guzerat, with general remarks on the action of Mercury in the Diseases of India. By A. GIBSON, Bombay Medical Department.

SEC. IV.—It is now pretty generally known, that, in the fevers of India, mercury alone is to be relied on in the early treatment, to obviate immediate danger——It may be supposed to have three modes of action: 1*st*, On the hepatic system; 2*dly*, On the intestinal canal; 3*dly*, On the general constitution.—Probably all these modes of action are essential to a perfect cure; and if either is deficient, the certain consequence is death, or chronic obstructions, which only yield, if ever, to a change of climate.

1*st*, If the liver is not acted on, it must, from the determination of blood to it, during the increased febrile action, be in great danger of being disorganized, or of its penicilli becoming consolidated, as a termination of the inflammatory state.

2*dly*, If the bowels are torpid and constipated, the liver will still be in the same danger; for though it may be pervious and active enough to eliminate bile from the blood sent to it

in the healthy state, and in the moderate action of the system, yet during the continued accessions of fever, it may be overpowered by the increased sanguineous afflux, which must either augment, or continue stationary, as long as the alimentary canal refuses to be moved by such means as would reduce or abate the volume of circulating fluid.

3dly, I have commonly observed the cure to be incomplete, unless the general constitution was affected; for such is the type which the fever very frequently assumes, that, unless counteraction is excited in the system, by the specific power of mercury, the healthy state both of the liver and bowels is inadequate to a cure; the paroxysms become continued; the febrile state is established, and in progress of time irremediable debility follows.

The species of fever, which I have seen prevailing in the province of Guzzerat, partakes chiefly of the typhoid character, though commonly denominated, I presume incorrectly, bilious. It differs from the latter form of fever in requiring less evacuation; and from the former, in the remission being such as to admit of stimuli being administered. The effects of stimuli are what one would look for in an inflammatory diathesis; yet excessive evacuations of any kind seem only to hasten the fatal termination.

The affinity between the constitutional symptoms, at the period either preceding the attack of fever, when the patient has been long languishing and unwell, or consequent to it, when the mercury has acted imperfectly, and hectic fever, cannot but strike every observant practitioner. Irregular accessions of slight rigors, sometimes quotidian, and sometimes not recurring for days, at uncertain intervals; *burning heat of the palms and feet, extending up the legs;* the feelings, and actual heat of the body, always above natural; a quick pulse, readily increased by the most gentle exercises; the easy excitement of the system to high febrile irritation, by the smallest meal of animal food and use of wine; the flushed countenance; cold clammy sweatings at one period, and dry, hot, parched skin at another, with emaciation, seem to correspond with the phenomena of hectic. But as the phenomena in question occur without suppuration, we must seek for a cause in the general debilitated state of the system, unless an idiopathic origin is allowed; and although I am not prepared to defend an opinion on this important point, the farther investigation of the subject by others, may substantiate the hint at some future period. A change to a cold climate,

if timely adopted, or even to another with fewer natural disadvantages, and if by sea, so much the better, fortunately, in most instances, serves towards a recovery. In the pining state above described, are the majority of those composing the convalescent-list of an European Regiment at sickly stations. Among the Officers also who embark for England on sick-leave, will be found a very large proportion in a similar state. But the soldier, from his humble situation, has not this resource at command, but must patiently wait till a relief of his Regiment takes place, when the only chance of a recovery is in his power; but in this hope how many perish! medicine being now exhausted on him in vain.

Absolute confinement during this unhealthy state of the body, is not often long endured, the person going about his usual occupation, unwilling to lay himself up in a country where the depressing passions are so predominant, and disease so fatal. But, with a multiplicity of uneasy feelings, and a gradual decay of constitution, yet ignorant where to assign his chief complaint, in sleepless nights and restless days, he lingers on a life of extreme misery, till debility, or fever, or its relapse, compel him to his sick-chamber.

In better climates, the phlogistic state of the system is adverse to the introduction of mercury; but the prudent abstraction of blood happily reduces it to that standard which is most favourable for its action. In India, however, in fever, the disease in which this is most speedily to be desired, the same mean would but in very few cases be admissible; for the debility is so great and instantaneous, as well as the tendency to putridity, that only in the robust new-comer is it, if ever, to be hazarded.*

I have only seen it used beneficially, where local pain indicated inflammation to be going on in the contiguous viscus. This, however, is foreign to the fever which I am describing; for, most commonly, no uneasiness is complained of, but the general feelings of pyrexia; and the low delirium and stupor so soon follow, with the sinking pulse, that no further information is to be accurately obtained from the patient; and dissection generally demonstrates nothing more than the congestion in the brain, usually met with in the fatal cases of typhus.

* The spontaneous hæmorrhages which are so distressing in the worst cases, from the nose, mouth, and ears, have always appeared to me to hasten death. Indeed, I do not remember an instance of hæmorrhage which did not prove fatal, and without exhibiting the smallest remission, not even before the period when it might with certainty be considered an untoward, and a truly alarming occurrence.

In this low state of the system, no preparatory steps are required by evacuation, further than the care and attention to the unloaded and free state of the stomach and bowels, so necessary in all fevers. On the contrary, in many instances, so great is the debility, that an early tonic is indicated; for it would seem that debility, as well as a plethoric system, is equally inimical to the specific mercurial action. And if the patient is fortunately invigorated sufficiently in this way to give the mercury influence, and before any organ essential to life is injured, by the strictest nursing and attention afterwards, the recovery is almost certain, all morbid action yielding from the moment ptyalism is brought on. But often during this long low period, when every effort is making to mercurialize, the quantity introduced, but as yet inactive, is so great, that when the effect is accomplished, such is the profusion of the ptyalism, that the most disagreeable consequences succeed, and a long and precarious period of convalescence. It is therefore a desideratum, the greatest in the treatment of this fever, to know a criterion by which to judge that you have pushed the mercury to the necessary extent, and no farther. In one instance, where the patient was fast sinking and harrassed with excessive diarrhœa, after long mercurial inunction, and the very large exhibition of calomel, in commiseration of the last moments of one apparently moribund, all further medicine was desisted from, but such as would give temporary vigour under causes so debilitating, while the skin was yet hot and parched, tongue black and dry, thirst insatiable, and pulse rapid. The effects were marvellous. In twenty-four hours after, the gums were inflamed, and in forty-eight the salivation was begun, and with it all symptoms of previous disease vanished. This I beg it to be observed, was accidental; and, since the same cause did not once occur again, during a long period, among the sick in a large and crowded hospital of one of his Majesty's regiments, it may be inferred that a criterion cannot be derived from it. This case, however, afforded a clear illustration of the inactivity of mercury in certain states of the system, and also a useful caution against persevering beyond a certain extent in its use.

No enquiry can be attended with a more beneficial result, if successful, than that which is now pointed out; for so universal is calomel in use, and so sovereign is it in efficacy, above all medicines yet introduced into Indian practice, that, unless administered by rule, and watched strictly in its operation,

there is much dread of its getting into undeserved disrepute. Those of my professional friends in India, who, with myself, have lamented, in so many instances, the futility of medical science, in climates so deleterious, will, I trust, before the conclusion of their valuable services, by their researches into the arcana of disease, yet throw light on a subject so very obscure as the diseases of India still are. If, after the system is already saturated with mercury, and in a disease too of the greatest debility and tendency to putrescence, a medicine so very powerful as calomel be persisted in longer, in the vain expectation of effects which will never become apparent, it is not being too rash, perhaps, to pronounce every grain given above a certain quantity to be prejudicial, and when increased to a greater extent, an active poison.

It may seem empirical to European practitioners, that calomel should be given, apparently so indiscriminately, in the diseases of India; but in all, either a counter-action to that existing in the system at the time, is supposed to demand its use, or it is rather to be presumed, perhaps, that the inflammation prevailing in many of them is of a peculiar and specific nature, as modified by climate, and will only yield to it. In fevers continued or remittent, and in dysentery and diseased liver, acute or chronic, it may be considered a palladium in medicine; but in the unmixed enteritis, which is too often insidious in its approach, and beyond the skill of the physician when first complained of, it is of very doubtful virtue. The preparations of mercury to be relied on are only the submuriate and the ointment. The blue pill is perfectly inadequate to any good purpose, and generally quite inert in India. To such as favour this essay with their perusal, it may meet their wishes to be informed of the tonic given in that stage of fever at which mercury was left off. A mineral acid, but above all, the nitric, is that which can with safety be ventured on, and it will be found to disappoint less than any other medicine. The cinchona, and all the class of bitters, only load the stomach, and increase the febrile irritation. Nitric acid is tonic without over stimulating. It is a grateful and cooling beverage to the parched mouth and burning body; it is therefore febrifuge; it is antiseptic, and in these combines the good qualities chiefly wanted at this period. The best test, perhaps, of its pleasant virtues, is the incessant call made by the sickly patient for the acid drink he got when last in hospital.—*Vide Ed. Journal, vol.* 11.

Observations on the Nature of the Climate, and the Fevers which prevail at Seringapatam. By A. Nicoll, M.D.

Sect. V.—Ever since the British took possession of Seringapatam, their forces, both European and native, have greatly suffered from the insalubrity of its climate. Any investigation, therefore, into the nature of the climate, and diseases which prevail there, becomes peculiarly interesting and important.

The following observations made on the nature of the climate, and the fevers which appeared amongst 700 Europeans and some native corps stationed at Seringapatam for eighteen months, will, I hope, place this subject in a more clear and satisfactory light.

Intermittent fevers are prevalent in every part of the Mysoor country, but are much more common at Seringapatam than in any other; and they vary according to the changes of the season and conditions of the atmosphere. In the hot months of the year, the fever becomes remittent or typhoid; the latter usually of that species denominated by Cullen *Typhus icterodes.** As the season cools, and the weather becomes more steady and pleasant, the remissions of the fever become more distinct; and as the weather gets what may be called cold, the regular agues are formed. Dysentery is frequently combined both with remittent and intermittent fevers; but is more common in the cold season than in any other. There is nothing peculiar in the approach of the remittent, much less in the ague. The yellow fever always presented itself in the beginning like a severe remittent, generally with great sickness at stomach, and vomiting of a greenish or bilious matter. A flushing of the face, and a degree of stupor and listlessness; a burning skin; full and quick pulse; frequent respirations, and excruciating pain in the head and loins, were the great pathognomonic symptoms of the disease. When at this stage of the disease a stop was not made to its further progress, still greater excitement and irritability of the functions of life came on, and incessant vomiting of a greenish or yellowish-coloured matter, delirium ferox,

* Synopsis Nosolog. Meth. cl. I. Pyrexiæ, Ord. I. Feb. Gen. V. Typhus Sp. II.

and sometimes dysentery, with great violence succeeded, and, in the course of a few hours, put an end to the sufferings of the patient. On or about the third day of the disease, the yellowness of the body generally appeared; the adnatæ, the neck, breast, and belly, shewed at first the partial transfusion, which became deeper in colour, the higher in violence the disease arose. Though the disease runs its fatal course in a few instances in 48 hours, yet it was generally on the sixth or seventh day that the patient died. This so often happened, that whenever I got my fever patients over these two critical days, I contemplated a speedy solution of the disease at hand.

The four first months of the year are excessively hot, close, and sultry, until the Malabar monsoon sets in, in May. At 5 in the morning the thermometer is generally about 65°, and, at 3 in the afternoon about 94° Fahrenheit. In May and June, by the refreshing showers and breezes wafted from the mountains, which separate the Mysoor from the Malabar country, the climate is rendered tolerably healthy and pleasant. Again it becomes hot and sultry in July, August, and September, but nothing like to the four first months of the year, until the Coromandel monsoon begins, in October, which, by its mild and salubrious influence, soon effects great and remarkable changes in the air and temperature of the place. At this season, especially in November, the thermometer at 5, P. M. has been so low as 48°, and, in the middle of the same day, has risen to 88°. *I have also frequently observed a difference of* 40 *degrees between six o'clock in the morning, and twelve of the day.* During the hot months of the year, the winds are generally southerly or easterly; in the cold season, they become westerly or northerly.

The *fort*, in which the troops chiefly reside, is in a very low situation, with lofty walls surrounding it, which, in a great measure, prevent the free circulation of air. Besides the barracks, hospitals, &c. for the forces being bad, and highly objectionable, there is an extensive bazar close to them, which, by its filth and situation, becomes no small nuisance to the Europeans.

Other sources of noxious exhalations are abundantly fruitful at Seringapatam. These, together with a moist sultry atmosphere, subject to great changes of temperature, from intense heat to extreme cold, have, in all ages, been viewed as the origin of pestilence and death.* In the ditches between the

* Hippocrat. Op. om. De Epid. Lib. I. c. iii. p. 238.

ramparts, and in various parts of the fort, where all the Europeans, and many thousand natives reside, are constantly deposited all the filth and corruption of the place. On the banks of the *Cauvery river*, and in several places of the island, pools, stagnant with offensive and putrid matter, are to be seen. All the mass of animal and vegetable corruption from a population, including Europeans and natives, no less than 90,000, is collected on a small space of ground, the circumference of the island not exceeding three miles. These materials of putrefaction, for about eight months of the year, lie in those repositories which I have mentioned, until the periodical rains of Malabar begin, which, falling in the *ghauts*, run down, and fill the Cauvery river. The filling of this river is always very sudden, and it comes rushing along with great impetuosity; sweeps out all the filth from the ditches; clears away all the impurities, so long stagnant in the island; and leaves the place, for a while, tolerably healthy, and the air cool and refreshing.

With regard to the infectious nature of the yellow-fever, some doubts are entertained, from never observing a single orderly attending those ill with the disease, or any of the other patients in hospital, who were oftentimes indiscriminately mixed together, for the want of room to put our sick and convalescents in, contracting the disease. However, the prevalence of this disease being regulated in its operation by a determined range of atmospheric heat, and, from numerous facts related, especially by that enlightened physician, Sir Gilbert Blane,* I have no doubt but that, under certain circumstances, in regard to the constitution of the atmosphere, and the susceptibility of individuals, it may evince an infectious nature.

The persons who were most subject to yellow-fever at Seringapatam, where the strong and robust, who had exposed themselves carelessly to the vicissitudes of the climate, and lived irregularly. Those who had been much exhausted by almost habitual drunkenness, and long residence in India, were the first who suffered, and fell victims to the disease. Three instances came under my notice, where, in characters corresponding to the above-mentioned, the powers of life were destroyed in the first paroxysm of fever. Irregularity, drunkenness, and exposure to the changes of the climate, when the body is in a state of perspiration, or *indirect*

* Blane, Diseases of Seamen, p. 605.

debility, are powerful agents in rendering the functions of life susceptible of morbid associations, or liable to the impressions of the morbid *virus*; yet certain situations, in respect to dryness and ventilation, though equally exposed to noxious blasts or exhalations, make no small change in the prevalence and nature of fever.

APPEARANCES ON DISSECTION.

The anatomical examination of the bodies of those who died of the yellow fever, was made with considerable attention and minuteness; but the appearances of the morbid structure of the most important organs, those connected with the functions of life, and seemingly with the disease, were by no means uniform or satisfactory, nor could they in any instance be applied to the full explanation of the morbid actions, which appeared in the rise, progress, and termination of the case.

Brain,—Always contained in its ventricles a large proportion of serum, and its vessels were generally turgid with watery blood.

Chest,—Seldom shewed much signs of morbid alteration in any of its viscera. Sometimes the *heart* appeared enlarged, and the *pericardium* contained more water than natural. At times larger portions of lymph, or polypi were found in the venæ cavæ, right auricle, and left ventricle. The blood was always very dark, and watery, running soon into putrefaction.

Abdomen,—Presented various morbid appearances, slight marks of inflammation on the pyloric portion of the *stomach*, but apparently proceeding from the acrid matters found in it, as the duodenum, which contained nearly similar matters, presented the same appearance. The *intestines* always held large quantities of fetid matter of various colours. The *liver* was rarely found any-wise diseased, but there was always a large secretion of bile. The *gall-bladder* was always turgid; frequently large quantities of bile were seen floating on the surface of the intestines.* When the bodies were inspected a few hours after death, the bile was *yellow*, but when kept more than twelve hours, it became black and putrid! The liquors found in the pericardium and ventricles of the brain, as also in the cavity of the abdomen at times, partook, but slightly, of some of the properties of bile; they were, however, sufficiently clear, as to put it beyond doubt, that the yellowness

* How came the bile there? Is it not more likely to be an effusion of yellow serum.

of the skin, and fluids of the body, in yellow-fever, proceeds from the bile having entered into the circulation, and communicated to them its colour.*

From these facts and observations, I am sorry to say, I cannot derive that advantage and important results to the practice of medicine which might be wished. This branch of medical science, which has for its object the ascertaining the seat and causes of diseases in organic derangements, affords ample fields for the investigation of physicians and anatomists, and can only be perfected by their unwearied exertions.†

The plan which was found most successful in curing the yellow fever at Seringapatam, was that which formed its indications: on, 1*st*, removing the violence of reaction, and, 2*ndly*, preventing exhaustion of the system by a recurrence of the fever. When the violence of reaction and inflammatory diathesis were sufficiently manifest, blood-letting was employed, the quantity extracted being regulated by the strength, age, and plethoric state of the patient. The appearance of the blood, when drawn, was no criterion whatever. In no instance, where general bleeding was had timely recourse to, and the quantity judiciously taken away, did the reaction of the system, the morbid heat, and general irritability of the animal and natural functions, continue unabated in violence. When the disease has just commenced, in any constitution, whether robust or plethoric, or weak and emaciated, if there are symptoms of any inflammatory diathesis, bleeding must be employed.‡ Small doses of calomel and neutral salts must be exhibited every hour, until the bowels are unloaded of their morbid contents, and the capillaries of the skin opened, and the surface becomes moist. But, along with the exhibition of those medicines, and after bleeding, while the skin is dry, the respirations frequent, and the animal heat 103° or 108°, the cold affusion must be resolutely and judiciously applied, and repeated, until the reaction of the system, and progress of the disease, are arrested. The cold affusion is the most powerful remedy in subduing the fever; and the only preventive against the irritability of the stomach, was keeping the bowels open by small doses of calomel and

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* Blane, Observations on Fevers, Part III. chap. I. p. 411.

† Cabanis, Revolutions of Medical Science, translation by A. Henderson, M.D. p. 294.

‡ Jackson's Treatise on Diseases of Jamaica, p. 31.

jalap, or solutions of the neutral salts. As soon as a distinct remission was obtained, it was found absolutely necessary to throw in the bark and wine, and prescribe a very nourishing diet, in order to prevent a recurrence of the fever, which, though subdued, is apt to return again and again, as before. I found the bark thrown up by injection into the rectum, a valuable remedy in cases where the stomach was irritable and nauseated it. In intermittent fevers, I have often exhibited it in the quantity of an ounce, joined with a little tincture of opium, in this way, just before the expected return of the fit, and in no instance did it fail of moderating the violence of the fit, if it did not succeed in preventing its return altogether.*

When there was great irritability of the stomach, constant vomiting of greenish-coloured matter, great morbid heat of the skin, delirium, and much exhaustion of the powers of life, the cold affusion, constantly repeated, while the spasmodic constriction of the vessels of the skin continued, and the morbid associations remained, is the remedy to be depended on; for, while it subdues the principle of fever, it invigorates the powers of life, and enables us to clear the stomach and intestines by gentle cathartics and laxative glysters.—These remedies, when judiciously applied in the early stages of fever, will seldom fail indeed to stop its progress, or bring it to a speedier issue; but they are not effectual in preventing its return where the body is again exposed to the cause which first produced it. Bark is the only remedy to be depended on, and when there is any morbid derangement in the *liver* or *spleen*, mercury must be employed. Blisters applied to the *head* and *stomach* were often of great service. When the paroxysm was subsiding, small doses of *opium* and *æther* were given with the most salutary effects. Under the above system of treatment, when the patient was brought to us on the first or second day of the disease, we generally succeeded in producing a final solution of the disease before the fourth or sixth day. When the fever continued beyond this period there was always great difficulty in putting a stop to its progress, if it did not kill the patient then. If the bowels were not kept open, and every slight exacerbation of fever checked by the cold affusion, the disease generally terminated fatally, sooner or later. But when any slight accession or exacerbation of fever was carefully watched and

* Heberden, Commentarii de Morb. Hist. et Curatione, cap. xxxviii. p. 160.

stopped by the cold affusion, applied in one way or another, a considerable remission at last took place, which enabled us to give the bark, and support the powers of life by due stimuli. Carrying the effects of calomel so far as to produce salivation, was never found necessary or beneficial in the beginning of the disease, *but often found valuable, in conjunction with the bark, when the disease chanced to vary its type, or continued long, and gave us some reason to suspect the presence of some organic derangement, or dropsical diathesis.* It thus appears, that the treatment of fever, of whatever kind or form, unaccompanied with organic derangement, is, now-a-days, both as simple and successful in India as in Europe.—*Vide Ed. Med. Journal, July* 1815.

BILIOUS FEVER.

Sect. VI.—This is the grand endemic, or rather epidemic (morbus regionalis) of hot climates; and although greatly allied in many of its symptoms, perhaps generally combined with the Marsh Remittent, already described, yet it occurs in various places, both at sea and on shore, where paludal effluvia cannot be suspected.

Notwithstanding that this fever is hardly ever mistaken, by the least experienced practitioner, yet so extremely diversified are its features, by peculiarity of constitution, climate, season, and modes of life, that it is very difficult to give even a general outline of it, without involving apparent contradictions. There are always, however, some prominent symptoms which sufficiently characterise bilious Fever, for every practical purpose, which is the chief object in view. These are, gastric irritability—affection of the præcordia,*—and affection of the head. Rarely will all, or any of these be absent. The other items in the febrile train are by no means constant and regular. Thus the pulse is frequently regular, and sometimes up to 120 or 130 in the minute. It is the same with the temperature of the skin. Often, when mad delirium is present, the pulse

* In the term præcordia I always include those viscera and parts immediately below the diaphragm;—the liver, stomach, and spleen, for instance, in the sense of Fernelius, lib. iv. De Febribus.

will be 86, and the thermometer in the axilla at 96° of Fahrenheit. The bowels are almost always constipated, or in a state of dysenteric irritation. No such thing as natural stools in this fever are ever to be seen, unless procured by art. Frequently, but not always, yellowness of the eyes, and even of the skin, takes place; and the mental functions are very generally affected, which indeed is characteristic of all bilious diseases. This fever is not near so dangerous as the more concentrated marsh endemics, such as those of Bengal, Batavia, &c. Indeed I have long thought that these last are the bilious remittents of the country, modified and greatly aggravated by the peculiar nature of the local miasmata. However, that they occasionally exist independently of each other, I have likewise no doubt; for we must not let the rage for generalising blind us to facts. My meaning is this; that the fever in question frequently arises from atmospheric heat, or rather atmospheric vicissitudes, deranging the functions or even structure of important organs; and that it is, as Dr. M'Grigor supposes, symptomatic of local affection. Where marsh miasma is added, which is generally the case, then we have the endemic of the place, modified by the peculiar nature of the effluvia, and from which we are not secured but by local habituation to the cause. Residence, therefore, on the banks of the Ganges, is no protection from the miasma of St. Domingo, or Batavia, as will be proved in a subsequent section. See also, what Mr. Boyle says on the Sicilian fever.

With respect to the treatment, I have never found it difficult, when the means which I have minutely detailed under the head of Bengal endemic, were early and steadily applied. Bleeding, I know, is seldom employed; but I can state that three other surgeons on the station, besides myself, had recourse to venesection in the fevers of India, with the greatest benefit. These were, Mr. Dalziel, late of the Naval Hospital at Madras; Mr. Cunningham of the Sceptre; and Mr. Neill, formerly of the Victor, latterly of the Sceptre. This is a small band opposed to the host of anti-phlebotomists; but it must be remembered, that the evidence in favour of bleeding is, from its very nature, more conclusive than that which is against it. In the first place, a great proportion of practitioners will be deterred from the use of the lancet entirely, by the current of prejudice. In the second place, a great many of those who do venture on it, will be easily discouraged by any reverse at the beginning, which is sure to be attributed to the heterodox remedy; a striking instance of which will be

given hereafter, in the section on "Endemic of Batavia." But on the other hand, those who persevere must be more than mad, if they continue a practice which is not beneficial; and if it is, how must their proofs accumulate! and how solid and experimental must be their nature, compared with those on the opposite side of the question, where prejudice and timidity are so apt to mislead?*

Finally, my opinion is this:—that when we wish to arrest the progress of bilious fever, "*cito tute, et jucunde,*" we should in all cases, where the constitution is not broken down by climate, and particularly where determinations to the brain or liver are conspicuous, as they too often are, take one copious bleeding at the beginning, (the repetition must be guided by the judgment of the practitioner), which will very effectually promote the operation of all the succeeding remedial measures, and obviate, in a great degree, those visceral obstructions and derangements, which this fever so frequently entails on the patient.

The following condensed, but clear account of this fever, as it exhibited itself, in all its shapes and bearings, and with no small degree of violence, on the great mass of a ship's company, will convey a better idea of the disease, and in a more practical way, than any general description, however laboured, or however minute. I have only to premise, that the symptoms were carefully noted, and the practice detailed on the spot, by a gentleman of no mean talent for observation; and although I differ from him on the *exhibition* of emetics, and the *omission* of venesection, it is with regret, as I entertain the highest respect for his abilities and candour. It will be seen that, in most other points, his practice is nearly similar to what I found most successful in the Endemic of Bengal.

"On the 2nd of March, 1804, His Majesty's ship Centurion dropped anchor in Bombay Harbour, on her return from Surat; at which time the ship's company were in good health. During the next week, the weather was variable—hot and sultry, in general, through the day, alternated with cold damp chills at night, when the dews were heavy, and the land winds keen from the adjacent mountainous coast.

On the 9th of the same month, several men complained of slight indisposition, which we did not consider of any impor-

* Since the first edition of this work, the proofs of benefit from venesection in the bilious remittent fevers of all climates have so multiplied, that it is needless to insist further on the propriety of the measure, in this section.

tance, little aware of the distressing scene to which this was an immediate prelude.

Centurion, Bombay Harbour, March 10th, 1804.

Eighteen men complained to me this morning, of having been taken suddenly ill in the night. Their general symptoms were—severe pain in the head, arms, loins, and lower extremities; stricture across the breast, with great pain under the scrobiculus cordis; retching and griping. In some, the pulse intermitted, and the temperature of the skin was increased; others had cold chills, with partial clammy sweats; but all complained of pain under the frontal bone; many of them with white furred tongues, and thirst. A solution of salts and emetic tartar, designed to operate both ways, was prescribed, with plenty of warm diluent drinks. P. M. The solution operated well, both upwards and downwards, in all the patients. Many complain now of pain in the epigastric region and head, with burning hot skins. Gave them Pulv. Antim. gr. vj. Tinct. Opii. gt. xx, Aq. Menth. uncias ij. hora somni sumend. with warm rice water, slightly acidulated, for drink during the night. The patients to be secured from the land-winds, which at this season of the year are considered very pernicious. Almost all these men had been exposed to the intense heat of the sun by day, and to the influence of the night air, while lying about the decks in their watches. Mr. Brown, the carpenter, was on shore in the heat of the sun to-day, and attacked this afternoon with the fever.

Bombay, March 11th, 1804.

Nine patients added to the list this day. The bilious fever set in with nearly the same symptoms as yesterday, and the same mode of treatment was pursued.

Many of yesterday's patients are very poorly this morning; complaining of severe pain in the head, limbs, loins, and across the epigastric region; with constant vomiting of viscid bile. Prescribed from five to ten grains of calomel, with small doses of antimonial powder, and tincture of opium, to be taken three or four times a day.

There is little intermission of pulse to-day. In some the skin is cold; in others hot, with insatiable thirst. Tongue, in

most cases, covered with a thick white crust. Great irritability of the stomach, and aversion to food. Bowels rather constipated—some have a fœtid bilious purging. P. M. The calomel appears to allay the irritability of the stomach; while the antimonial powder and tincture of opium keep up a warm moisture on the skin.

Bombay, 12th March.

Ten added to the list this morning, with bilious fever. The symptoms and treatment nearly as before. Some of the patients of the 10th are better to-day, the irritability of the stomach being a good deal allayed by the calomel and opium; but they still complain of pain in the head and limbs, with great debility. Eyes heavy, and tinged yellow—pulse full—bowels constipated. Prescribed a dose of Natron Vitriolat. after the operation of which, the calomel, &c. to be continued as before.

The emetic-cathartic solution operated well with the nine patients of yesterday (11th); most of them are very ill this morning. They have incessant vomiting of green thick bile, with pain in the epigastric region and head—thirst insatiable. Prescribed the calomel, opium, and antimonial powder, as in the other cases. No delirium has yet appeared in any of the patients; nor much alteration from health in the pulse. In many, the temperature of the skin very little, if at all increased; constipation of the bowels nearly a general symptom.

The decks are now crowded with sickness.

Bombay, 13th March.

Eight added to the list this morning, with the prevalent bilious fever. Scarce any heat of skin, or acceleration of pulse. *All appear to labour under some hepatic affection, which seems to be immediately communicated to the brain, causing great pain under the frontal bone.** Vomiting, I

* It was from observing this symptom, that I was long ago led to form the *ratio symptomatum* of fever, sketched out in the first section—namely, that independent of the sympathy existing between the brain and liver, the congestion or as it were, stagnation of blood in the portal circle, causes a greater determination to the brain, whereby that important organ becomes oppressed, and keeps up the train of febrile symptoms. If this cerebral congestion is relieved by bleeding, or any other means, immediate energy is communicated to the heart and arteries—re-action and biliary secretion follow, and the balance of the circulation and excitability is once more restored. Vomiting, as determining to the surface, will produce this effect; but the gastric irritability is dangerous. Lastly, mercury, as keeping up a steady action in the extreme vessels of the vena portarum, and in all the excretories, prevents the balance of the circulation and excitability from being again destroyed.

think, relieves them a good deal. The quantity of bile they discharge is enormous, and of a depraved or highly vitiated quality.

Most patients of the 10th and 11th appear very ill; complaining of pains across the epigastric region, and in the head, with frequent vomiting of bile; tongues swelled and furred—no great heat or acceleration of pulse. The constipation of bowels I relieve by doses of natron vitriol. or calomel and jalap. The calomel, &c. taken from 15 to 30 grains a day, according to the urgency of the symptoms. No appearance yet of ptyalism in any of the patients. The thermometer placed in the axilla of several, did not shew more than 96½° or 97°—the pulse not exceeding 88 in the minute.

Many of yesterday's patients (12th) are also very ill. All appear to labour under some morbid affection or secretion of the liver. Two of them much troubled with cough, and spasms in the muscles about the neck, impeding deglutition and respiration. Blisters, with vitriolic æther and tinct. opii. relieved this symptom. The warm bath had no good effect. Pulse nearly natural,

Bombay, 14th March.

Nine added to the list this morning, with the prevalent bilious fever. Two of them were suddenly seized with violent mad delirium, and made a dart to get overboard, but were providentially secured in time. No heat of skin, or acceleration of pulse; but all complain of pain in the head and epigastric region, which emetics and blisters frequently relieve.

Those patients who were first attacked (10th) are very ill; many of them highly tinged yellow; their eyes swelled, and the blood vessels a good deal distended. Pain in the head still continues severe. At night many of them are delirious. The mercurial treatment continued. I tried the bark, with nitrous acid, in several cases to-day; but it did much harm, greatly increasing the irritability of the stomach. The fever seems inclined to run through the whole of the ship's company.

The patients of yesterday (13th) are very ill. The calomel in general sits easy on the stomach, and appears to check the vomiting a good deal. I find doses of the natron vitriol. and emetic tartar cleanse the stomach and bowels better than calomel and jalap.

Bombay, 15th March.

Five men attacked last night; one with violent phrensy, who was in good health a few minutes before. He was all at once seized with mad delirium, and made a dart to get overboard, but was caught. Scarce any increased temperature of the skin, or acceleration of the pulse. The delirium was removed by an emetic. P.M. A few have their mouths slightly affected, and are much better, but still complain of pain in the head and right hypochondrium. Our decks are now crowded with sick, and the effluvia intolerable. The ship is daily fumigated. Sent twenty of the worst cases to Bombay Hospital, many of them very ill, and changing yellow.

Bombay, 16th March.

Five men were suddenly seized during the night with violent mad delirium—great oppression at the epigastrium—abdomen distended—perfect loss of memory, and all recollection of their messmates and others around them, mistaking one person for another.—Great desire to destroy their own lives, and the lives of those who held them down.—The pupils of the eyes a good deal dilated, and not inclined to contract when exposed to a strong light.* All of these evinced a great desire for lime-juice, which I gave them, and which they frequently mistook for porter. But at times it was difficult to make them swallow any thing, as they would crash the vessel in which it was offered between their teeth. When full vomiting was excited, it generally relieved them, by bringing away immense quantities of viscid or vitiated bile. They all complained, at intervals, of pain in the head and epigastric region, but particularly in the right hypochondrium. I bled in one case, tried the cold affusion in another, and the warm bath with purgative enemas in a third, without success.†

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* The cerebral and abdominal plethora is here so strongly painted, that I should have considered myself authorised to bleed *usque ad deliquium*, or the relief of the symptoms.

† The quantity of blood abstracted is not mentioned; but it is perfectly immaterial; for unless venesection be carried *usque ad deliquium or the relief of the symptoms*, no possible good can accrue, but even harm. This is a practical fact, well known to those who have tried this remedy in the east. It may be accounted for thus: the portal congestion, from its peculiar position (in a circle of vessels, whose circumference is entirely composed of capillaries), places a great portion of the vital fluid at rest, and determines the remainder more particularly to the brain, by which this organ becomes oppressed. Now if venesection be not carried the length of relieving the cerebral congestion, and so letting loose the energy of the brain on the system at large, it is quite

Our decks now being crowded with sick, sent 21 men to to Bombay Hospital, viz.

11 of those attacked on the 10th and 11th instant; several of them changing yellow, and all of them labouring under hepatic affection, with great pain under the frontal bone.

5 of those attacked on the 12th; not quite so bad as those who were first seized.

5 of those taken ill 13th and 14th.—Symptoms nearly the same.

Tot. 21 in number.

The remaining patients on board are very ill. All complain of pain in the head and liver, with a diseased secretion of bile, and constipated state of the bowels—swelled, furred tongues—restlessness and exacerbation at night, with slight heat of skin, thirst, and trifling acceleration of pulse—frequent giddiness and stupor, without the least relish for food. I continue to evacuate the bowels with natron vitriol. or calomel and jalap, and persevere in the mercurial treatment till ptyalism takes place.

Bombay, 17th March.

Eight men attacked with fever during the last twenty-four hours: four of them with violent mad delirium; the others complained of pain in the head, loins, lower extremities, and epigastric region, with swelled, tremulous tongues; but no great heat of skin, or quickness of pulse. Some were slightly indisposed for a day or so before; others had no premonitory sensations whatever. They were all well evacuated with the emetic-cathartic solution, or calomel and jalap: I prefer the former, as it acts both ways at once.

Several on board are very ill, without the least appearance of ptyalism; others have their mouths affected, and the bad symptoms disappearing. In the former, I can perceive little

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clear that we diminish the strength without gaining our object, and consequently retrograde from the proper path. This is not meant to censure the surgeon whose practice is detailed. Considering the general prejudice against bleeding in India at that time, it would have required no small degree of fortitude to employ so heterodox a remedy under the immediate eye of the presidency, where even success would hardly have supported the innovation.

or no alteration in the temperature or pulse from a state of health.*

Sent 17 to the hospital to-day; many of them changing yellow, with *pain and fulness about the liver, and severe head-ache.*

Bombay, 18th March.

Six admitted this morning: three with violent mad delirium, which lasted several hours; in the others, the symptoms were milder. All our nurses are now dropping ill, and the fever seems to acquire a contagious character, as it is running through the whole of the ship's company.† One of the wardroom officers was attacked last night. We now send them on shore nearly as they are taken ill.—*All labour under some affection of the liver, which is immediately communicated to the brain.*

At noon, sent 15 of the worst cases to the hospital; several of them changing yellow. They are generally attacked first in the night, and always experience an exacerbation afterwards, as the evening closes in. No remissions on alternate days; the only amelioration is in the mornings‡

I this day visited all our patients at the hospital. Several of them are very ill—many quite yellow; and all have great pain and fulness in the region of the liver, with constipated bowels. They are treated nearly in the same manner as on board; the medical gentlemen there placing their whole confidence in a continuance of the mercury. They attach much importance, however, to friction with ung. hyd. fort. over the region of the liver; giving three grains of calomel four or five times a day, in conjunction with small doses of antimonial powder and opium, as occasion requires. Two patients at the hospital are delirious at night.

Bombay, 19th March.

Twelve taken ill with fever since yesterday; most of them attacked during the night. In eight cases it set in with

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* Is there not great torpor throughout the system here, from the state of the brain?

† Although it does not follow that the disease is contagious, because the nurses are taken ill; yet it appears very probable that this fever *became* contagious *from accumulation.*

‡ Miasmal fevers, when not very concentrated, often shew remissions on alternate days; till at length, as the season changes, they slide into intermittents. When they are so virulent, however, as to occasion great and sudden derangement, whether of function or structure in important organs, it is needless to say, that such remissions cannot be looked for.

violent mad delirium. Several of them were in perfect health a few minutes before; others had some slight previous indisposition.

Six cases on board have now shewn symptoms of ptyalism, and are greatly relieved in all respects, with some return of appetite. As the spitting increases, the yellowness of the skin disappears proportionally. Prescribed the nitrous acid both to the convalescents, and those now under the mercurial course; a practice much recommended by Mr. George Kier, surgeon of this presidency.

Bombay, 20th March.

Five people attacked since yesterday; two, without a moment's notice, were seized with violent mad delirium.* The other three with symptoms more moderate; but all with pain in the head and epigastric region. They were treated as already detailed. Sent 18 of the worst cases to the hospital; all labouring under hepatic affection, and many of them very ill. A few more have their mouths affected since yesterday, and are getting better.

Bombay, 21st March.

Ten cases of fever within the last 24 hours. Four of these were men who came on board from the Elphinstone East-Indiaman a few days ago, and were attacked with violent phrensy and convulsive exertions, craving for drink of various kinds. After the spasms were allayed, they complained of pain in the epigastric region and head—tongues swelled—pain in the liver—vomiting of acrid bile†—stricture across the forehead and sinciput—pulse natural. After vomiting, they found themselves much relieved. Prescribed calomel, opium, and antimonial powder, as already detailed. at ten o'clock this morning Lieut. P. was attacked with de-

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* The nature and violence of the attack shew that it could not proceed from *latent* miasmata received previously at Surat. Neither could the fever arise *entirely* from land-wind effluvia here, since the other vessels lying in harbour were not affected. Some people may suspect a local cause in the ship's hold, or elsewhere, but no such source is traced by the gentlemen composing the survey. The constitutions of the crew, coming in from the more equable temperature of the sea, were strongly affected by the abrupt atmospherical vicissitudes at Bombay; and the effects resulting thence were aggravated by the miasmal impregnation of the land-wind by night.

† Did this violent mad delirium arise from the brain sympathizing with the liver or st-mach, where acrid bile might have been accumulated? Or did it arise from exhalations conveyed by the land-winds, and acting on the brain? I am inclined to think that it was owing to both.—Contagion?

lirium—pain in his head and epigastric region—tongue swelled, and white—muttering between his teeth—no heat of skin. He assisted last night in holding several men who had mad delirium, and probably inhaled the effluvia from their breath or bodies. Two patients, who were convalescing since the nineteenth, and taking nitrous acid, seem inclined to relapse as the soreness leaves their mouths;—mercury again prescribed.

Bombay. 22nd March.

Five added since yesterday, with the prevailing fever. All complain of pain in the head and right hypochondrium—eyes and tongue swelled;* the latter covered with a bilious crust—small, hot, bilious evacuations by stool, with great thirst.—*They cannot bear the slightest pressure on the region of the liver.*

I have applied for a medical survey on the state of the ship, to inquire whether or not the fever is contagious, and what is the best plan of arresting its progress.

Bombay, 23rd March.

A young man in perfect health, who has been ten years in India, while assisting his sick messmate into the hospital boat to-day, was all at once attacked with the fever. Severe pain in the head, epigastrium, and liver, was soon followed by the most violent mad delirium, and incoherent language; he fancying the people around him were going to murder him.—No heat of skin or acceleration of pulse. This state lasted four hours, and was relieved by a vomiting of fœtid, green, acrid bile.

The fever not so prevalent now, and seems to have spent its force, as only one man was seized in the last twenty-four hours. The nights are becoming warmer, which I hope will soon check its progress.

Bombay, 24th March.

Five men attacked since yesterday; one with the usual mad delirium. All labour under pain in the head, epigastrium, and liver; with white swelled tongues; pulse and temperature

* This symptom is noticed by Mr. Tainsh, on the coast of Syria (Medical and Physical Journal), and by the Gentleman of Bussorah, who narrates his own case. Transactions of a Society, &c. &c.

little increased. Prescribed gentle emetics of pulv. ipecacuan. with plenty of warm diluent drinks, on their first complaining.* After the operation, calomel, opium, and antimonial powder four times a day, with pediluvium.

Pursuant to my request, a medical survey was held on board to-day, by the following gentlemen, viz.

Dr. Moir, of the Medical Board;
Dr. Scott, ditto ditto;
Dr. Sandwith, of the General Hospital;
and myself.

After an investigation and mature deliberation, it was agreed that the following would be the most effectual means of checking this fever, *which appears to be contagious*.†—

"1st. To land all the sick at the General Hospital.

"2d. To remove the ship to Butcher's Island, and there disembark the remainder of the ship's crew, with their bedding, &c.

"3d. To clean, whitewash, and paint the ship throughout; to fumigate her, and likewise the people's bedding, with nitrous gas; and to fire off all the lower deck guns."

Bombay, 25th March

Nine cases of fever in the last twenty-four hours. Three, who were in perfect health a few minutes before, were seized at once with mad delirium. Several of those patients, whose fevers were checked at the commencement of ptyalism, and where I trusted the remainder of their cure to nitrous acid, are now relapsing, their mouths being quite well.‡

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* Some change in the administration of emetics is here evident, though no reason is assigned. I think the plan I have recommended, of allaying the gastric irritability by calomel, or calomel and opium, and then procuring copious intestinal evacuations, will be found the safest practice; as it effectually emulges the liver and its ducts, and prevents, or lessens the abdominal and cerebral congestions; especially when aided by early venesection.

† "It has never been known," says Dr. Bancroft, "as I am informed, that a "single case of this fever (typhus) had occurred on either side of the Indian peninsula." *Essay on Yellow Fever, page* 510. If this be the case, and if the respectable gentlemen abovementioned, who had the best means of ascertainment *on the spot*, did not give an erroneous judgment, it follows, that *other fevers* may, under certain circumstances, *become* contagious.

‡ I have expressly remarked, in the second section, that *free and copious* ptyalism is necessary. Where this is brought on in a few days, and especially where bleeding or other evacuations have been early premised, there has seldom so much derangement taken place in the liver, or even its functions, as to require the continuance of mercury. But where no V.S. was employed, and the disease has gone on many days before ptyalism, as above, the action of mercury must be kept up for some time after the fever is checked, till the functions of the liver are completely restored.

I cannot say much in favour of the acid, though so highly recommended by Dr. Scott and Dr. Kier of this presidency, who give it in all cases during and subsequent to the mercurial course. Those attacked yesterday were gently vomited with ipecac. and warm diluent drinks; after which they took small doses of calomel, opium, and pulv. ant. four times a day, with tepid bathing; a practice much recommended by Dr. Moir of this presidency. Sent eight cases to the hospital—sixteen on board.

Butcher's Island, 26th March.

Pursuant to the decision of the Medical Survey, we this day landed on Butcher's Island our sick, sixteen in number, in various stages of the fever; some with their mouths getting sore, and the bad symptoms disappearing—some in a state of ptyalism and convalescence—and others with all the usual symptoms of the fever, particularly the hepatic affection, head-ache, and yellowness of the eyes and skin.

B. Island, 27th March.

No addition to the list since landing. All those whose mouths are affected have no other complaint than debility. The sick are comfortably situated in the castle, which is well aired and clean.

B. Island, 28th March.

Several patients now convalescent, with sore mouths. One patient very restless last night, with great heat of skin, and pain in the region of the liver, which was relieved by a blister, and calomel bolus, with opium and antimony. Most of the others have hepatic affections, which subside as the system becomes impregnated with mercury.

B. Island, 29th March.

All in progress to recovery; their mouths getting sore.

B. Island, 30th March.

Two men, who were yesterday employed in cleaning the ship, have been seized with fever; but the symptoms are milder than in those formerly attacked on board. Same treatment.

B. Island, 31st March.

Only twelve on the list. Most of them convalescents, with sore mouths.

B. Island, 4th April.

The patients at Bombay Hospital recover very slowly. Almost all of them labour under affection of the liver, with severe head-ache, debility, and want of appetite. They have sent us over thirty cases, for change of air. Two more were attacked yesterday with fever and dysentery; they had been employed in cleaning the ship. After evacuations, the calomel as in the others.

B. Island, 5th April.

Of the 30 patients received from Bombay Hospital, none are worse. They find themselves cooler and more comfortable here. Several have considerable affection of the liver, attended with night fever, which is sometimes ushered in with rigors and cold chills, succeeded by hot skin, thirst and head-ache. Prescribed five grains of calomel, one of opium, and two of antimonial powder, thrice a day; blisters to the part affected. All my original patients are better, with sore mouths and debility. *I tried the decoction of bark in several cases, but find they recover faster without it.* I also tried the nitrous acid, but cannot say much in its favour. The two patients with dysenteric symptoms have pain in the region of the liver.—The same treatment as the others.

B. Island 6th April.

The patients from Bombay Hospital recover surprisingly fast. Three of them were highly tinged yellow, which goes off as their mouths become sore, Many have constipated bowels: decoction of tamarinds, with natron vitr. an excellent laxative. A few of the convalescents, as they get stronger, have a return of pain in the liver, for which the calomel is again prescribed.

The dysenteric patients are relieved by the calomel and opium—the tenesmus not near so violent. Mercury continued.

B. Island 7th April.

The patients from the hospital daily gain strength and appetite; *more particularly those whose mouths are well affected with mercury.*

All the fevers experience a nocturnal exacerbation; in some ushered in with rigors.

In Bombay Hospital this fever runs great lengths. Several patients are quite yellow, with debility—severe pain across the epigastrium, in the head, and in the loins. No great acceleration of pulse; but all are much worse at night than during the day. Calomel, opium, and antimonial powder, internally, with frictions of the ung. hyd. and frequent purgatives, are the means employed by the physicians of the hospital. They also tried the bark and nitrous acid, with the worst success: it generally occasioned great sickness at stomach, stricture on the surface, and obstructed perspiration, with universal inquietude. Removed 32 cases more of fever to Butcher's Island from the hospital.

B. Island, 10th April.

The bilious fever not near so prevalent now, as when we were on board; and in all attacks the symptoms are milder.

The patients from the hospital promise fair; some have dysenteric complaints, which go off as the mouth becomes sorer. Two fresh attacks, with much pain in the region of the liver, and bilious vomiting. The usual treatment pursued.

Many of those last received from the hospital complain of pain in the head and liver region. Their mouths had been affected at the hospital, but are not so now. The mercurial treatment to be renewed.

Butcher's Island, 14th April.
Thermometer. 90°.

In some of the last 32 patients from Bombay Hospital, the fever seems inclined to run great lengths. Sometimes they appear tolerably well; at others, they labour under severe pain in the head, epigastrium, and liver, with great debility and aversion to food. I tried the bark in several of these cases, but think it did harm, by increasing the pain in the head, and general inquietude. In other cases, I gave small and frequently repeated doses of calomel, with the nitrous acid, which answered the purpose much better. The constipation was best obviated by decoction of tamarinds with natron vitriol.

The patients in the general hospital recover very slowly; and several are extremely ill. The hospital is close, and badly aired; and the men contrive to procure arrac, which

they cannot so well do here. I therefore removed over sixteen patients to-day, all very ill; two of them quite yellow, with severe affection of the liver.

B. Island, 16th April.

Most of those last from Bombay Hospital are under the influence of mercury, in which course I persevere. The others convalescing fast.

B. Island, 23rd April.

Most of my patients are now in a fair way. We have removed all that are able to bear removal, from the hospital to this Island. They all labour under hepatic affection, and are under the influence of mercury, which I continue.

25th April.

We this day embarked all our sick, 84 in number, and dropped down to the middle ground. All our patients in rapid progress to recovery, and all under the influence of mercury.

At sea, 27th April.

Sailed yesterday for Goa. Our patients in a state of progressive convalescence; thirty-two remained behind at Bombay Hospital."

(Signed) *Wade Shields*, Surgeon, Centurion.

The perusal of this narrative cannot fail to excite our interest, and strongly arrest our attention. We observe an unwearied assiduity and perseverance in the Surgeon, with a coolness of observation, and candour of recital, that greatly enhance the value of the document. It bears on its front intrinsic marks of fidelity. There is no finesse or disguise; he tells a plain, unvarnished tale. Few medical men have gone through more trying scenes in India, than this gentleman, of which the above is but a trifling specimen.

The following reflections on this fever may here be allowed.

First, with respect to its contagious nature; I believe that few, who have been much in hot climates, will hesitate to pronounce, that at its commencement, it did not exhibit a single trait of contagion. A ship comes in healthy from sea; and after being a week in port, where no contagious disease prevails, has all at once eighteen of her crew knocked down

in one night with fever, and every night afterwards a similar repetition, more or less, till in a few days—" the decks are crowded with sick, and the effluvia intolerable." From this period it certainly betrays some symptoms of a contagious nature, particularly in the check which it all at once experienced on their landing on Butcher's Island, and in the circumstance of the men who were cleaning the ship afterwards, being the principal sufferers. Add to this, the decision of the medical survey, judging it to be contagious. This corroborates my observation respecting the Endemic of Bengal, and which I believe will apply to most other endemics, as those of Batavia, Madagascar, Johanna, West Indies, &c. namely; that they are never originally contagious in their own nature, but may under peculiar circumstances, acquire that character occasionally, from accumulation, confinement, and inattention to cleanliness and ventilation.

I myself could never see any just cause, why a number of sick men, crowded together, should not generate a contagious disease, as well as a crowd of people in health. That the latter circumstance has sometimes happened, will, I believe, be very generally admitted, notwithstanding the opinion of Dr. Bancroft. But be this as it may, the fever in question was a bilious fever, and one of very considerable violence too. Although the season of the year was not that of autumnal remittents, yet the land-winds, in all seasons, and in all tropical climates, are more or less impregnated with miasmata; and that these had a considerable share in the fever above described, I entertain no doubt.

2dly; the determination to the liver and brain was here so conspicuous, that it became the prominent feature of the disease; and although not always so unequivocally manifested as in this instance, is ever to be suspected in tropical fevers.

Many of the observations contained in the foregoing narrative, strongly corroborate my ideas on the nature of fevers in hot climates, as detailed in a preceding section. The theory is perfectly applicable to the symptoms of this fever.

In miasmal fevers, the congestions in the head and portal circle were the consequences of impaired energy in the brain and nervous system, as there explained. The same congestions take place here, partly from the same cause (miasmata conveyed by the land-winds and acting on the brain) but principally in the following manner:

The extreme vessels on the surface of the body, and by sympathy, of the vena portarum in the liver, having been excited into *inordinate* action during the intense heat of the day, are suddenly struck torpid by the raw, damp, chilling land-winds; the consequence of which is, that perspiration and biliary secretion are checked; the blood determined inwards, is impeded in its passage through the liver, and accumulation ensues in the portal circle, "which is immediately communicated to the brain," as observed in this Gentleman's narrative more than once, and as I have already explained.* During this period, the bile stagnating in the biliary ducts, becomes viscid; and on the recommencement of a hurried secretion, from emetics or other medicines determining the blood to the surface, often so obstructs the natural passage into the intestines, that regurgitation into the circulation takes place, and tinges the skin yellow. A great deal, however, is forced up through the stomach in a viscid and vitiated state; tending to keep up the gastric irritability, and sometimes to destroy the stomach altogether. This view of the subject explains why the men were almost all seized in the night, and why a nocturnal exacerbation was ever afterwards observed. With strict justice, therefore, and with more propriety, we might denominate the fever in question—"Hepatic," rather than Bilious Fever; and with some slight modification, principally in degree of violence, I shall shew, in a future section, that in reality it is, *alter et idem*, hepatitis itself.

3dly, in regard to the treatment. Although as I have before hinted, I differ from this gentleman respecting the exhibition of emetics, and the omission of V.S. yet, it must be confessed, that his success in the end was great, and sufficient to confirm him in the opinion, that the practice was the best that could be devised. Indeed, it was the general practice of the country. It does not appear that any deaths occurred, either on board or at Butcher's Island; and as eighty-two men were removed back to the latter place from the general hospital, and thirty-two left at Bombay, when the Centurion sailed, the whole number sent at different times on shore to the hospital is accounted for, viz. one hundred and fourteen.

* "It is evident," says Dr. Blane, speaking of fever, "from a number of "facts, that the state of the *brain and viscera* depends on that of the external "surface of the body; for a free state of the pores of the skin, provided it is "general, tends more than any other circumstance to relieve internal pain, "and also to take off delirium." *3d ed. p.* 358,

Thus out of full 150 cases of this fever, (which it will readily be granted, was no very mild or tractable disease) none died, unless subsequently at the hospital, out of the 32 left behind. But if we look to the sequelæ of the disease, resulting from the great hepatic derangement that accompanied the febrile state, there will be some draw-back on the otherwise uncommon success of the practice pursued. The utility of early venesection and purgatives is no where more conspicuous than in obviating these disagreeable consequences, as will be fully shewn in the next section, where they had a fair trial.

One thing, however, is certain; and a very important consideration it is, namely, that as the *mercurial treatment, unassisted*, was here entirely followed, and implicitly confided in, both on board and at the hospital, so it will require some sophistry in its enemies to explain away these stubborn proofs of its extraordinary power and success.

Had this fever, so strongly characterised by yellowness of the skin, bilious vomiting, head-ache, &c. happened in the West Indies, or at Gibraltar, or Cadiz, and in autumn instead of spring; and had any new mode of practice just coming in vogue been strictly pursued, would it not have furnished a pompous communication to a medical board, announcing the agreeable intelligence, that *yellow fever* might now "hide its diminished head;" for that 150 cases of it, in a very violent form, had been successfuly treated, *on the new principle*, without the loss of a man!

Into how many delusions have the medical world been drawn in this manner? And what jarring contradictions, and virulent controversies, have resulted from them! The cause has been elegantly stated near two thousand years ago.—

> Omnibus in terris, quæ sunt à Gadibus, usque
> Auroram et Gangem, PAUCI DIGNOSCERE POSSUNT
> Vera bona, atque illis multum diversa, remota
> Erroris nebula.——————————JUV.

Fever in His Majesty's Ships Russel *and* Sceptre, *on the Coromandel Coast.*

Sec. VII.—In the year 1805, a fever of considerable violence, and of apparently a contagious nature, broke out in the Russel, and was afterwards communicated to the Sceptre, on the Coromandel coast.—It went nearly through both ships' companies. In the Sceptre it was most ably combated by my friend, Mr. Cunningham, who bled boldly and decisively, till the symptoms were mitigated; this and continued catharsis were almost the only means employed to subdue the fever; after which, the strength was recruited with bark. The general symptoms of this fever were as follow:—

The attack was, for the most part, sudden, and without premonitory sensations. Many dropped down upon deck, as if they had been shot through the head; and on recovering a little, expressed a sense of violent head-ach, most commonly confined to the forehead and orbits of the eyes, with oppression on the præcordia. They all complained of giddiness, and great prostration of strength, which occasioned them to totter in their walk. Rigors and chilliness then ushered in the disease. The patient always complained of the most excruciating pain in the back, loins, and extremities—frequently of the breast, abdomen, and shoulders. The countenance was sometimes pale, dejected, and collapsed; but in nine cases out of ten, there was a fullness of the features, a flush in the face, with a redness in the eyes, which appeared enlarged and projecting, with a sense of pain and dimness of vision. The state of the tongue was very variable: in some quite natural, in others dry; in some it was covered with a white, in others a yellow, slime or mucus. In all cases, where the disease was not checked by the third day, it became extremely foul. Whatever was the state of the tongue, the patient always complained of great thirst, want of appetite, and impaired digestion. There was equally as great variety in the pulse: in some it was nearly natural—in some strong, frequent, and full; in others slow. In general, however, it was both more full and frequent than in health. The skin was always dry and constricted; the temperature, in general, greatly increased. The bowels were sometimes costive, and sometimes loose; nausea and vomiting very common. These

were the leading features of the disease; and the treatment was simple, but successful. *Blood was taken till the symptoms were mitigated, whatever the quantity might be; and repeated whenever they returned.* Full and free catharsis all this time was kept up; and when nothing but debility remained, bark and tonics confirmed the cure. In the Russel, where the same fever prevailed, the treatment was as different as the success. The surgeon was attacked himself; and great numbers were sent to the hospital at Madras, where the ship then lay. The disease was afterwards got under, however, by the prompt exertions of Mr. Edman; but the ship's company felt its effects for years afterwards, and many a victim fell at its unhallowed shrine.

In the Sceptre, as it was generally checked in a very few days, the consequences were not near so lasting as in the other ship's company.

It is quite evident, that this fever was of a very different stamp from that described in the last section, as "Bilious Fever;" the climate, season, and all other circumstances, were different. It evinced a contagious character from the beginning, in the Sceptre. In the Russel, I have good reason to believe, that it was generated, in consequence of great negligence and filth, in various departments. But it soon acquired the power of propagating itself in the best regulated ships. On the Russel's arrival in Madras Roads, (from a cruise off Ceylon, where the fever broke out) the disease was pronounced by a medical survey to be contagious.* But further proofs of this were soon exhibited. Some caulkers having been lent at this time, from the Sceptre to the Russel, were seized with the same fever that prevailed in the latter ship, shortly after their return to their own. Soon after this, again, the disease spread in the Sceptre's ship's company, and in particular directions from its origin; at last affecting some of those officers who were most exposed, from local circumstances, to its influence; among others, the medical officers and nurses. The Sceptre, however, put to sea, and kept cruising on the Coromandel coast, between Madras and Vizagapatam, which doubtless mitigated, in some respects, the fever.† The determination to the liver, and the

* I was in Madras Hospital myself at the time.

† When I say that the fever was generated in the Russel from filth, and became contagious afterwards, from the crowding and dirtiness of the sick, I only state the opinion of the medical gentlemen who surveyed the ship and crew at Madras. But I do not wish to enter into controversy with Dr. Ran-

gastric irritability, were not here very conspicuous; but in the Russel, where early venesection, and copious intestinal evacuations made no share of the cure, these symptoms were by no means rare.

The medical narrative shews throughout the whole progress of the disease, that its features were those of contagious fevers. And if we can safely bleed in such cases, why not in endemic fevers, where the symptoms are still more violent, and the visceral derangements more frequent, and earlier in their appearance?

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croft, who has taken such pains to establish, of late; that, *under no possible circumstance*, can the crowding of men, in sickness or in health, generate a contagious fever or render another so. I have read with great impartiality, (perhaps with some bias in favour of the author, from the great congeniality of our sentiments on most other subjects) his arguments and elucidations; But I cannot say that conviction has followed. I shall only quote a single passage from one of the ablest of the Anticontagionists, Dr. Fergusson, who after stating that "under *ordinary* circumstances of ventilation, they [yellow fever, bilious remittent, and bulam] are not contagious," goes on thus:—"Under the *contrary* circumstances I have no doubt but that a *typhoid infection* may exist here [West Indies] the same as elsewhere, which, however, is certainly dissipated as soon as ventilation and purity are restored. Some well marked cases of *typhous fever*, and others of a *mixed* nature, have lately been sent to the hospital from the huts in the rear of the barrack of the Queen's regiment, into which the married people of that corps crowded in great numbers." *Med-Chir. Tran. vol* viii. *p.* 152. I have avoided quoting the case of the CHILDERS from this distinguished Physician, where he says, "The fevers on board of her from crowding below decks when at sea, *ceased to be yellow ones*, and became as truly *typhoid* as any I ever saw," because in a subsequent correspondence with Dr. Bancroft, he endeavours to explain away this passage; but among the neutral party it will surely have its weight. Granting that he proves the local origin of the Childers' fever in the hold, how will he explain the circumstance of its *ceasing to be a yellow fever?*

In respect to the propagation of the fever in the Sceptre, Mr. Cunningham, a decided anticontagionist, has related the above particulars himself; and while he is unwilling to allow, does not attempt to deny contagion. These simple facts do not accord with the following, I think, hazardous sentiment of Dr. Bancroft, *Essay*, *page* 701. "The high temperature between the tropics is so unfavourable, I need not say to the generation, but to the *existence* of febrile contagion, that, even when it happens to be brought into that temperature, *it cannot subsist, much less propagate itself.*" The remainder of this note in my first edition having given rise to an *expostulation* on the part of Dr. Bancroft, I have cancelled it. The facts on both sides of the question will ultimately prevail over arguments.

ENDEMIC OF BATAVIA.

SEC. VIII.—The following, as it is the most recent, so, I think, it will be found the most accurate and detailed account, of the Batavian Endemic, that has yet appeared in an English dress.

In the month of June, 1800, His Majesty's ships Centurion, Dædalus, La Sybille and Braave, having on board a detachment of the 12th regiment, consisting of 127 men and officers, sailed from Madras, on a secret expedition; and on the 23d of August following, the squadron anchored in Batavia Roads. The Centurion and Dædalus were placed about four miles from the garrison, to blockade the port; the Sybille kept constantly shifting about, to interrupt the approach of small vessels to the city; and the Braave lay at anchor under the small island of Onrust, about three miles from the main land of Java.

During the first few weeks, the squadron continued tolerably healthy, and without any deaths; although the crews were much harrassed by night and by day, in chasing the enemy's vessels, rowing guard, and loading or unloading the prizes off the island of Onrust.* The weather was pretty temperate at this time; the thermometer, in the shade, generally ranging from 82° to 87°, with regular sea and land breezes. When the latter, however, came off from the low, swampy grounds about Batavia, early in the mornings, it brought with it a thick mist, accompanied by a very fœtid smell; all of which would gradually go off, as the sun rose, and the sea breeze set in. During the prevalence of this fœtid mist in the morning, many people would complain of slight indisposition in the head and stomach, which likewise went off as the sun came out.

About this time the Braave disembarked an officer and some men of the 12th regiment, on duty at the island of Onrust, where a temporary hospital was established; and here the first appearance of *endemic* fever was observed. It was not, however, in any alarming degree, but chiefly confined to those

* Contrast this with what happened to the crews of the Russel, Albion, and Powerful, at the same place, in 1806, when their sanguine hopes of surprising the Dutch squadron were suddenly dissipated. *Vide sec.* 11.

who lived intemperately; as none of the officers of that ship were attacked, though they frequently slept on shore. Some of the people having broken open a spirit-store on the island, were in the habit of getting intoxicated, in which state they often exposed themselves to the intense heat of the sun, by day, and the damp, cold dews of the night. A few of the 12th regiment fell victims to fever, much aggravated, if not occasioned by irregularity; in consequence of which, an idea was very generally propagated, that the island was peculiarly unhealthy.

On the 14th September, the Centurion relieved the Braave, and took charge of the hospital, where twelve cases were left behind, most of them very ill, and some of whom died. Prepossessed against the island, the surgeon of the Centurion declined landing any of his own sick there, at first; till, finding that some of the Braave's, who were exceedingly ill, recovered, and that none of the nurses were attacked at the hospital, he ventured to land six of his worst patients (bilious remittents and fluxes), who all did well. He therefore became convinced, that the reported insalubrity of the island was unfounded, in a great measure, at least.

Unfortunately, however, the commanding officer of the expedition, conceiving that the vicinity of the island to the main land was the cause of sickness, (which supposition seemed corroborated by the fœtid mists that daily came off from thence to the island) ordered the sick to be removed, on the 28th September, to the small island of Edam, situated nine miles out to sea; a circumstance that he thought must insure its salubrity. Here the tragic tale commences;—but first let us glance at the medical topography of the two islands. Onrust is a small island, three miles from the main, well cleared of trees, underwood, and jungle; nearly flat, and free from swamps or marshes, except one very small spot, which, however, is daily covered twice by the tides. On this island there were many excellent buildings, where the convalescents could be separated from the fever cases, and where all could have abundance of space and ventilation. From the fœtid exhalations, which were conveyed by the land winds from the neighbourhood of Batavia, the sick were easily secured, by closing certain apertures in their apartments, till the sun dispersed the vapours in the morning; after which, there did not appear to be any danger from the miasmata disengaged during the day. Edam, on the other hand, though farther out of the reach of Batavian exhalations, is covered

with trees, long grass, and jungle, having a part of the Island itself in a stagnant, marshy state. The buildings here were indifferent, and only one long ward could be found, for the sick and convalescents; in consequence of which, the latter class of patients experienced all those dire effects produced by the depressing passions, for ever nurtured by the melancholy scenes of death, which this fatal spot too constantly presented to their view! Thus, in running from a doubtful danger, they precipitated themselves on certain destruction. In leaving Onrust (a cleared space) to avoid the effluvium of Batavia, weakened and diluted by a three miles passage from its source, they settled on the jungly and marshy island of Edam, where pestilent miasmata, in a concentrated form, issued from every foot of ground around them!—The fatal effects which followed, were predicted by an intelligent Surgeon on the spot, but his suggestions were disregarded or overruled; *distance* from the main being held paramount to all other considerations.

Of sixty soldiers (12th Regiment) landed at different times, *in health*, to do duty at Edam hospital, and other buildings on the island, between the 1st October and 12th November, thirty-one died (besides five or six at Onrust, previously.) Of the remaining twenty-nine, embarked on breaking up the blockade (12th November), twenty-two died at sea; the other seven were sent to Malacca hospital, where all, or nearly all of them, shared the same fate!—In short, only sixty-two returned out of the whole detachment; the rest having fallen ingloriously, without drawing a sword!

All the soldiers getting ill on Edam, sixteen Marines were landed from the Centurion, to do night duty, as they expected an attack from the Dutch gun-boats. The whole of these were seized with the fever, and thirteen died; two recovered, and one was sent to Malacca Hospital.

The loss of seamen I have not been able exactly to ascertain; but it must have been considerable. Almost the whole of the sick [twenty-eight in number], who were removed from Onrust to Edam [28th September] died. And as nine Officers, including the Surgeon, Mr. Cornish, who were doing duty at this dreadful island, perished, we may form some idea of the general mortality.

It is worthy of remark, that the Dædalus, in which 25 of the detachment from the 12th regiment were embarked, did not land a man on any of the islands, nor did one of her men die, or suffer an attack of this endemic. Such is the outline

of its history; the following are the features of this fever, principally as it appeared at Edam, its head-quarters. They were noted on the spot, by a very intelligent surgeon of the expedition, who I believe is now in England, and who had ample opportunities of observing the disease, in all its shapes, as affecting various constitutions.

" The patient, without much previous notice (if the first attack) is suddenly seized with giddiness and cold chills—sense of debility, and vomiting, with pain over the orbits, and in the epigastric region. He frequently falls down, and is insensible during the paroxysm; his body covered with cold, clammy sweats, *except at the pit of the stomach, which always feels hot to the palm of the hand*—the pulse is small and quick. On recovering a little, this train of symptoms is succeeded by flushings of heat—increased pain over the orbits, and in the sinciput—pain and a sense of internal heat about the stomach and præcordia—oppressed breathing—the lower extremities, at this time, not unfrequently covered with cold sweats. The eyes now become, as it were, protruded, and the countenance flushed. Retching, and at length, vomiting of discoloured, bilious matter, comes on—the tongue white and furred—the abdomen tense and full, with pain in the loins and lower extremities. The length of this paroxysm varied from six to eighteen hours, and was generally succeeded by cold rigors—very often low delirium, preparatory to the next stage or paroxysm of the fever. The intellectual functions now become much impaired, the patient not being at all sensible of his situation, or of any particular ailment.—If asked, how he is? he commonly answers, " Very well;" and seems surprised at the question. This was a very dangerous symptom, few recovering in whom it appeared. In this stage all the symptoms become gradually, often rapidly, aggravated; particularly, the head-ache—pain and tension in the epigastric region, and vomiting. Some patients, *on shore*, were carried off in 18, 24, 30, or 40 hours, and others not till as many days after the attack, especially when removed on board, from the more noxious air of the island. A great proportion changed, in a few days, to a bright yellow; some to a leaden colour: other cases terminated fatally, in a very rapid manner, too, without the slightest alteration in that respect. Generally, however, the change of colour indicated great danger. Vomiting of black bilious stuff, resembling the grounds of coffee, frequently commenced early, and continued a most distressing symptom; too often baffling all our

attempts to relieve it. In some, a purging of vitiated bile, or matter resembling that which was vomited, occurred; in a great many, a torpor prevailed throughout the intestinal canal—rarely did any natural feces appear spontaneously.—The pupil of the eye was often dilated, and would not contract, on exposure to a strong light—in others there was great intolerance of light:—both indicated danger. Low delirium was a pretty constant attendant on this fever, from first to last; sometimes, though more rarely, raging high delirium. Mr. Carter's was an instance of the latter, which he had in a very terrible degree, with red, inflamed, and protruded eyes—great inquietude—hot, dry skin—small, quick pulse; his mind actively employed about the stores and prizes on shore, of which he had charge previous to his illness. During the violence of the paroxysm, he was quite insensible to every thing that was going on around him, constantly grasping at, or wrenching those objects within his reach. He made frequent attempts to get overboard. In the low delirium, also, the mind is much occupied on avocational subjects: if a seaman, about the ship's duty; if a soldier, about his regiment, marching, &c. Some patients were comatose from the first attack; in others, the fever was ushered in with convulsions, delirium, and cold sweats, without any intervening heat of the surface, except at the pit of the stomach, which, in most cases, was burning hot to the touch, and accompanied internally by a similar sensation according to the patient's own feelings.

Hæmorrhage from the mouth or nose seldom occurred; in two cases, which terminated fatally, the blood did not coagulate, but tinged the linen yellow. Aphthæ appeared in a few cases, and indicated danger. Subsultus tendinum often attended both on the high and low delirium. The pulse never could be depended on. In the very last stage it has been regular; but, in general, it is small, quick, and either hard or stringy and tremulous; sometimes, during the re-action of the system, full and hard. Deafness was very common, and an unfavourable symptom. Two kinds of eruption appeared about the lips—one such as we often see at the decline of common fevers; the other, consisted of small black or brown spots round the lips, and was likewise a dangerous, indeed a fatal symptom. With this eruption, the teeth, tongue, and fauces generally become covered with a brown or black crust, and the breath intolerably fœtid. Locked jaw took place in two cases at Onrust Hospital, but the patients were insensible of

it:—both died. *The brain appeared the organ chiefly affected at first—the stomach and liver in succession.** In those cases which occurred on board, and where the patient had not *slept* on shore at Edam, the symptoms were much milder, and the fever resembled more the bilious remittent of other parts of the East. A great torpor prevails generally throughout the system, with the low delirium; blisters, medicines, &c. having little effect on the patient, who appears as if intoxicated. When roused, he recollects the person who is speaking to him, for a moment, and answers in a hurried, incoherent manner; then lies on his back, his mouth and eyes half open; both feces and urine often passing involuntarily. I have seen them remain in this state for hours—nay, for days together, scarcely moving a single voluntary muscle all that time. In this melancholy situation, Lieut. Neville, of the 12th regiment, lay for some days previous to his death.—Never was there a disease so deceitful as this fever: I have frequently seen instances where every symptom was so favourable, that I could almost have pronounced my patient out of danger: when all at once he would be seized with restlessness—black vomiting—delirium—and convulsions—which, in a few hours, would hurry him out of existence!

This was the case with Mr. Broughton, Purser of the Dædalus, who died of the Batavian endemic at Edam Hospital. On the seventh day of his illness, he took a change for the better; and every thing was promising. The morning before he died, he expressed himself greatly relieved; and called for some mutton-broth and sago, both of which he ate with a good appetite;† spoke rationally—and was in good spirits. Towards evening the delusion vanished—restlessness—black vomiting—delirium and convulsions supervened, and carried him off before morning! I have seen many cases terminate in this manner. Two patients at Edam complained of a diminished size of the brain, and that they felt as if they could shake it about within the cranium:—both died. Mr. Cornish, Surgeon of the Dædalus, who had charge, for a while of the hospital, was one; he died on the seventh day of his illness.

The fatal terminations generally happened on the third—fifth—seventh—ninth—and not unfrequently the eleventh and thirteenth day; if they passed this period, they usually lingered

* This accords with my observations on the Bengal Endemic, and with the mode in which I supposed miasmata to act on the human body.

† Hunger is a fatal symptom in the Yellow Fever.

out twenty or thirty days. But very few indeed ever ultimately recovered, who had slept on shore, and were attacked at that dreadful island, Edam! No constitution was exempted from the assault of this fever. It seized with equal, or nearly equal violence, on those who had been many years in India, and on the most robust and plethoric, or newly arrived European. Even the Dutch Officers and Malays, who had been drawn from different parts of Java, and whom we had prisoners at Edam, fell victims as fast, or nearly so, as the English. Several officers, seamen, and soldiers, were sent on board from this island, in hopes that the change of air might mitigate the disease. Many of even the worst cases of these would promise fair for a few hours in the forenoon; but night always dispelled our hopes, for then the patient relapsed as bad as ever :—they almost all died. But their fate was considerably procrastinated by the change; many of them lingering out a great length of time on board, sinking at last from the consequences of the fever, rather than from the fever itself. Several of them changed into obstinate intermittents at sea, with great derangement of the liver, spleen, and bowels. Indeed the liver, in most cases, seemed affected from first to last in this fever; but in all protracted states of it, this affection became the prominent symptom. In those that were cut off during the first 18, 24, or 30 hours, the brain appeared to be the organ oppressed. With respect to the question, whether or not this fever was contagious? I am decidedly of opinion that it was not so. For if all the nurses and medical attendants of the hospital at Edam died, it must be remembered, that they were equally exposed to the cause of fever, whatever it is, as the soldiers and seamen who did duty at the barracks and other buildings, or who were sent to the hospital for other complaints; all, or nearly all of whom, shared the same fate. Moreover, what I conceive decides the question, is this; that although on our raising the blockade of Batavia, great numbers of sick, in every stage of the fever, were brought on board from the hospital at Edam, yet not a single nurse, or medical attendant of any description, ever suffered the slightest attack of fever; nor did any circumstance transpire, that could in the least favour the idea of contagion, notwithstanding that the great accumulation of sick on both decks, rendered it a matter of impossibility to separate them completely from those who were well, nor at all times to prevent a considerable generation of effluvia.

From our first arrival at Batavia, in August, until our return to Malacca, in January following, we only buried one man of fever, who had *not slept on shore at Edam, Cuypers, or Onrust islands; whereas almost every person, who slept even a single night at Edam, died.* No ill effects were experienced from going on shore in the day time, or among the sick at the hospital. I myself regularly visited the hospital of Edam every day, with perfect impunity, till one night that I staid rather late, attending the unfortunate Surgeon of the Dædalus; in consequence of which I was three days afterwards seized with the fever, but recovered by mercury carried to ptyalism. I think it highly probable, however, that had I slept on shore, no medicine would have saved my life.

The night before we raised the blockade, parties of men and officers were sent on shore at Edam to blow up and destroy the works and buildings on the island, which operations detained them about half the night there. Most of these were shortly afterwards attacked with the fever, but all recovered except one (Mr. Parry, midshipman); his fever, too, was checked by mercury; but being of a diseased habit, he relapsed when the soreness left his mouth, and died. The gunner, carpenter, and other officers, were all seized with the fever; but the former, being principally employed among fires, in laying trains, blowing up, &c. had the disease in an infinitely milder degree than any of the others.

One circumstance more is so singular in itself, and so much attracted our notice at the time, that I think it deserves commemoration. *Of all the people or patients who slept at the fatal island of Edam, four only, to the best of my knowledge, escaped the fever entirely, and returned to Malacca. These were two obstinate venereals, and two chronic dysenteries; all under the influence of mercury, for some time before I sent them to the hospital. Their complaints did not get better in the least on shore, so that they continued to take mercury there. They slept in the same ward with the fever patients all the time, but never had the slightest symptom of fever themselves.* One other patient at the hospital did not catch the fever, but he was sent there in the last stage of phthisis, and died a few days after he landed.

I have omitted to mention, that despondency, or anxious timidity, very frequently accompanied the access of this fever; while a placid resignation to their fate, or rather, an insensibility to their situation, marked its fatal close.

Treatment.

In this, as well as in the common fevers of India, where a redundancy of vitiated bile might be suspected lurking in the primæ viæ, I have always prescribed a solution of salts and emetic tartar, as the first medicine, which generally operated both upwards and downwards; and subsequently, by perspiration, in a short space of time, to the great relief of the patient. On the same evening, an anodyne antimonial draught (vin. ant. one drachm tinct. opii, gut. xv. vel xx, aq. menth. two ounces) was exhibited, to allay the irritability of the stomach—promote the cuticular discharge, and dispose to sleep. Bleeding I was afraid to attempt, as in the *only case*, to my knowledge, where it was tried in this fever, the patient very soon afterwards died, in a state of putrescence. *From this circumstance, and from some accounts which I had read, of its bad effects in fevers of the West Indies, I gave up all idea of the lancet.** I therefore had recourse to evacuations from the bowels, and from the skin. For the latter purpose, I tried various medicines; such as the saline draughts, with sp. æther. nitros. tepid bathing, with diluents, &c.; but I found none equal to small doses of antimonial wine, and tincture of opium; given frequently, with plenty of warm, diluent drinks, and occasional pediluvium. By perseverance in this plan, for a few days, *in the less violent cases*, the skin has become relaxed, with an equally diffused perspiration—the pulse soft and natural;—the pains and delirium have disappeared; and nothing but debility remained, which was soon removed by bitters—bark, wine, and nourishment.

But alas! in the more concentrated forms of the disease, by which we were now surrounded, this practice was far from successful. *For here the patient hourly lost ground; and seemed to be hurried out of existence by the local effects of the fever; chiefly confined to the brain and liver. What the nature of these local effects was, I am unable to say. They appeared to be either inflammation—an accumulation—or a greater determination of blood to those organs, or perhaps something compounded of all these; and evinced by the red, inflamed state of the eyes—the delirium—the oppression, tension, and often pain, in the epigastric and hypochondriac*

* He probably alludes to Dr. Chisholm.

*regions.** Finding, then, that bleeding would be attended with fatal consequences, and that antiphlogistics and tonics were alike ineffectual, I was forced to have recourse to other means; and knowing that mercury was a powerful specific against local inflammation, particularly of the liver, as well as a most valuable medicine in bilious remittents, where visceral obstructions were forming, or formed, I placed my last hopes in the employment of this active remedy. I generally prescribed calomel combined with opium, and antimonial powder, in some few cases with camphor, in the following manner;

Calomel, six or eight grains,
Antimonial powder, two grains,
Opium, one grain.

These were made into a bolus, and taken every three, four, or six hours; so that from twenty-four to thirty-six grains of calomel might be taken in the course of the day and night.—If a salivation could be excited in a few days, the patient experienced an immediate change. The fever entirely left him—the pains abated—the intellectual functions were restored—the stools became natural, and nothing but tonics, nourishing diet, and change of air were wanting to perfect the recovery. This last desideratum (change of air) the most important of all to convalescents, was least of all within our power, while we inhaled the noxious atmosphere of Batavia.

Here, then, we had the mortification to see our patients, after being rescued from the jaws of death—every symptom of fever gone, and after being several days convalescent, with a relish for food—relapse one after the other, *as the soreness left their mouths*, and die almost to a man!

Many instances, however, occurred at Edam Hospital, where mercury was prescribed in large quantities, *after other medicines had failed in the beginning*, without affecting their mouths; in which case, they all proved fatal. I have sometimes prescribed bark and wine, in conjunction with mercury, to support the system during its exhibition, and I think that in several instances it accelerated the ptyalism.† Blisters often gave temporary relief to local symptoms, such as pain—

* I need hardly remark, that these conclusions, the result of observations made at the bedside of fever, and in an extensive field, form a striking coincidence, and a corroboration of the theory of fever which I framed in the same school of experience.

† This is similar to Dr. Balfour's plan.

hepatic affection, and vomiting. They likewise served as stimuli, to rouse the patient from stupor and delirium.

In the early stage of this fever, the tepid bath was used with advantage; but in advanced states of the disease, I think it did injury, by increasing debility. I have frequently experienced the greatest benefit from sponging the body with cold vinegar and water, where there was low delirium—cold, clammy sweats—and stupor. In such cases the pulse, from being 120 or 130, would fall to 90, and a refreshing sleep succeed;—but night always brought on the usual exacerbation. Gentle emetics of ipecacuanha, I have often found to relieve the delirium, oppressed breathing, and load at the stomach or præcordia, even at an advanced period of the disease. *In cases where great determination to the brain appeared, I have often given brisk doses of calomel and jalap, with surprising good effect. Indeed, evacuating medicines of every kind, where they do not tend to debilitate the system, are extremely useful in the early stages of this fever.* Wine, porter, and nourishment, did more harm than good, except in the advanced periods of the disease, when porter was always beneficial in checking the vomiting, and allaying the irritability of the stomach. Bark, in many cases, did much harm, by bringing on or increasing the vomiting, and other dangerous symptoms—besides checking the perspiration, and rendering the patient hot and restless. In some cases, however, I think it produced good effects, especially when guarded with opium, to make it sit on the stomach.

But could the patient be removed from the noxious air of Batavia into a purer atmosphere during the mercurial course, I should not have a doubt in the efficacy of mercury; for it was the only medicine that ever bade fair to check the ravages of this dreadful fever. Without this change of air, I believe that every human means will have but a temporary effect; and excepting mercury, few of them will have even that.

It is necessary to say, that copious ptyalism must be brought on, otherwise it will prove inefficient. I tried the nitrous acid, as recommended by Dr. Scott of Bombay, but cannot say any thing in its favour. The Dutch medical practice at Batavia, consists in giving camphor in weak julep; making the patient drink quarts of it in the course of the day, till the perspiration teems from every pore of his body; keeping him all this time in a close room, well covered over with warm bed-clothes, and without paying the least attention to any urgent symptom, or other means of arresting the fever. But

this plan was very unsuccessful; for the mortality in the garrison of Batavia, while we lay before it, was dreadful, particularly among the European soldiers.

Previous to our appearance, the Dutch, in general, resided a few miles up the country, on elevated ground, and out of the reach of those pestilential vapours that issue from the low swamps in the vicinity of the city. There they enjoyed tolerable good health; but our arrival forced them into the garrison, where they had hard duty, day and night, in keeping a look-out upon us, and throwing up works to defend the place. The fever therefore, swept them off in prodigious numbers, so that their loss far exceeded ours. In an action with some of their gun-boats, we had a few men wounded, who did well on board. But this seems to be a rare circumstance; for one of our officers being on shore with a flag of truce, was asked by the governor, how our wounds succeeded; and being informed that they were all nearly well, he seemed quite astonished, and would hardly give credit to the account; declaring, upon his honour, that during fifty years which he had passed at Batavia, he never knew a single instance of a man surviving a wound received in the noxious air of the city and its neighbourhood.* He also expressed great surprise, that our mortality in the squadron was not greater; as he calculated on our losing at least half our men during our long stay there. The Dutch ships generally lost from half to three-fourths of their crews, between their arrival at Batavia, and their departure for Europe.

CASE I.—Jas. Barrett, *Onrust Hospital.*

September 15th, 1800. Has been ill about forty-eight hours. At 5 P. M. to-day, a mad delirious fit; with difficulty can be kept in bed; tongue tremulous, white and furred; eyes red; complains frequently of his head, with pain in the epigastric region; skin hot, with some perspiration on it; has been taking bark three or four times to-day; head to be shaved and blistered; pediluvium; an æther and anodyne draught at bed-time—the bark infusion to be given through the night.

16*th*. Had a very restless night; pain in the head excessive, and not relieved by the blister; calomel, gr. x. jalap

* This corroborates the circumstance mentioned by Lind, of the slightest scratches turning into dreadful ulcers, on board the Panther and Medway, in 1761.

one drachm, statim sumend; at 1 P.M. it operated, and brought off numerous, copious, fœtid green stools. At 6 P.M. head not relieved; a profuse perspiration; pulse 90; tongue brown; talks incessantly, in the most incoherent language; all the symptoms very unfavourable; the anodyne antimonial at bed-time.

17*th*. He lay in a state of stupor all night; this morning, skin warm, and a little moist; decoction of bark every two hours, which he retains well on his stomach. At 1 P.M. lies in a state of stupor, and with difficulty can be roused; mutters between his teeth incessantly; eyes inflamed and prominent; abdomen tense and full; pulse frequent and hard; tongue dry; bowels opened by an enema; continue the bark; and to take calomel, gr. x. opii. gr. j. at bed-time.

18*th*. First part of the night more composed; restless in the latter; this morning, stupor as before; lies on his back, with mouth and eyes half open; with difficulty can be roused; body has an offensive smell; cold, clammy sweats, skin changing yellow fast; pulse small and quick; when roused, will take whatever is offered; the decoction of bark through the day; repeat the colomel and opium at bedtime.

19*th*. Passed a tranquil night; repeated the calomel this morning; the decoction of bark to be continued; at 1 P. M. omitted the bark, and exhibited a saline cathartic, which brought off three copious fœtid stools; at 8 P.M. he appears better; he is perfectly sensible; skin a bright yellow; but is warm, and has an equally diffused moisture on it; repeat the calomel and opium as in the morning.

20*th*. Passed an easy night, but had no sleep; at 8 this morning, he seems better in every respect; continues sensible; repeat the calomel; also decoction of bark; at 1 P.M. uneasiness in his stomach and bowels; fever increased; great incoherence in language and ideas; *omitted the bark; prescribed a cathartic, which brought off many copious fœtid stools; at eight in the evening, a remission of the fever; other symptoms more favourable*; the calomel continued.

21*st*. Passed a good night, and is better this morning; repeated the calomel twice to-day, with bark decoction; at 8 P.M. an exacerbation of fever; repeat the calomel.

22*nd*. Passed a tolerable night; a mercurial odour on the breath; skin becomes less yellow, with equally diffused perspiration; the calomel and decoction as before.

23*rd*. Mouth sore, and all symptoms favourable; yellowness goes off the skin; perfectly sensible; no head-ache

stools more natural; craves for food; continue the calomel, with a pint of wine and nourishing diet.

27*th*. Ptyalism did not come on copious till to-day; he is now free from every complaint, except debility; appetite good—spirits free; yellow tinge almost gone; omit all medicine—convalescent list.

28*th*. He was this day sent, with other convalescents, &c. to Edam Hospital, where he afterwards caught the fever. He was removed immediately on board; the same plan of treatment adopted, and as soon as ptyalism appeared he began to mend. He was one of the very few who ultimately recovered from the fever of Edam.*

CASE II.—Wm. Ward, Marine, *Onrust Hospital.*

September 18*th*, 1800. At 1, P.M. to-day, complained of pain in his head, back, and loins; skin burning hot; tongue foul; pulse small and quick; pain at the stomach; nausea and retching; an emetic, which operated well; at night the anodyne antimonial draught.

19*th*. Passed a restless night; this morning complains much of his head; severe purging and griping; skin intensely hot; tongue foul and dry; the emetic-cathartic solution, which operated well both ways; at 8 P.M. the anodyne antimonial draught.

20*th*. Passed a very bad night; high fever this morning; dysenteric purging; skin burning hot and dry; tongue foul; pulse very quick; fixed pain about the umbilicus; tenesmus; calomel, grs. viij; pulv. ant. gr. ij; opii, gr. j; to be taken twice a-day.

21*st*. All the symptoms worse to-day; skin clammy, with partial sweats; stools green, thin, small, and frequent; severe tenesmus; burning heat and pain at the stomach; omit the calomel; saline draughts with camphor through the day; anodyne antimonial at night.

22*nd*. Passed a very restless night; severe purging of green, fœtid stuff; pain in the head and epigastric region excessive; skin intensely hot; pulse quick; thirst insatiable; great inquietude, never resting a minute in one position; had recourse again to the calomel, opium, and antimonial pow-

* I leave it to the candour and judgment of the reader, whether the cure is to be attributed here to the bark decoction, or to the intestinal evacuations and mercury. This is a very valuable case—for it was a very formidable one; on the 18th it appeared nearly hopeless.

der; but to be taken morning, noon, and night.—At eight P.M. a little more composed.

23*nd*. Passed a better night; this morning very restless and uneasy; all the symptoms as bad as yesterday morning, with the addition of frequent delirium, and pain in the right side.—The same treatment as yesterday.

24*th*. Slept some last night; symptoms this morning rather more favourable; the internal burning heat in the epigastric region not so great; the extremities covered with cold, clammy sweats; the calomel bolus repeated three times, as usual, with camphor mixture every four hours.

25*th*. The dysenteric symptoms not so violent to-day; heat and pain in the epigastrium diminished; the pain of the right side subsiding; at noon, a violent paroxysm of fever, ushered in with rigors, which has left him in a very debilitated state; added decoction of bark and port wine to the mercurial treatment.

26*th*. Mouth sore; fever gone; bowels easy; asks for food; medicines continued as yesterday.

27*th*. Ptyalism; recovering fast; omit the mercury, and to have nourishing diet.

28*th*. Ptyalism continues; free from all complaint; returned on board of his ship.*

CASE III.—Jos. Hughes, Marine, *off Edam*.

October 9*th*, 1800. Complained this morning of the usual symptoms of the Batavian fever; his head-ache exceedingly intense. He had done duty on Onrust Island, where he slept, and often got intoxicated with arrac; an emetic, and after its operation, the anodyne antimonial draught.

10*th*. A very restless night; great pain in the forehead this morning; internal heat and pain at the pit of the stomach; tongue foul; bowels uneasy; pulse full and quick; fre-

* This is also a very valuable case. It shews us the fever accompanied with dysenteric symptoms—and where the determination to the liver was quite evident.

If these honest and plain narratives do not remove every shadow of doubt, in regard to the power of mercury in tropical fevers of the East, all human testimony is vain. These documents are more convincing than if they came from myself—for I might either be blinded by prejudice, or have some interest in distorting the truth. Neither of these can have operated here—for the practitioner evidently resorted to mercury with reluctance, and hardly ever, till other means were first tried. Lastly, I cannot deviate in the least from the letter of the original; for the gentleman who noted these cases is now in England (though perfectly unconscious of their coming before the public) and could instantly detect any misrepresentation.

quent small, green, fœtid stools; ordered the emetic-cathartic solution, which operated well both ways; the anodyne antimonial as last night.

11*th*. At one o'clock this morning, he was seized with convulsive twitchings; difficult breathing; alternate flushes and rigors; rattling in his throat; insensibility; pulse small, quick, and irregular; sp. c. c. gt. xxx. aq. menthæ one ounce and a half, æther. vitriol. half a dram; this paroxysm lasted three hours with momentary intermissions; at eight this morning, more composed; skin hot and dry; tongue foul and furred; abdomen full and tense; natron. vitr. one ounce; two copious fœtid stools; evening, something better; perspires; the night draught as before.

12*th*. Slept till midnight; at one o'clock, stole out of bed, and leaped overboard; but was instantly picked up by a boat, that happened to be alongside. He was now perfectly sensible, and somewhat frightened; could not account for his conduct; returned to bed; at nine this morning, tongue foul; skin warm and clammy; body has a disagreeable smell; camphor julep every two hours; at 1 P.M. became very restless; made several attempts to get overboard; (to walk in the garden, as he expresses it); talks incoherently; at 4 P.M. worse; cold, profuse, clammy sweats; complains of no pain; when asked how he does? replies, "Very well;" pulse small and fluttering; lies on his back, in a state of stupor; mouth and eyes half open; can hardly be roused; the camphor julep continued, with an opiate at night. He drank a pint of Madeira wine in the course of the day.

13*th*. No sleep last night; cold, clammy sweats to-day; made several attempts to get overboard; pulse small and quick; tongue covered with a brown crust; still answers that he is "very well" (a dangerous symptom); decoction of bark and port wine; his stomach retentive; opium and camphor at bed-time.

14*th*. Very restless in the latter part of the night; delirious; made several attempts to get overboard. This morning, violent black vomiting, which was checked at 1 P.M. by opium, æther, and a blister to the epigastrium; great restlessness; constant desire to get overboard; skin cold and clammy; brain and mental functions still much disordered; craves for wine, which is given to him; at 4 P.M. more collected; begs to be sent to the hospital; his request complied with. At 5. P.M. he got up, in good spirits; dressed himself; went into the boat, unassisted; when

landed, he insisted on carrying his own hammock and bed up to the hospital, which he actually did—he there drank a glass of port wine, and went to bed; at eight in the evening he was in a sound sleep, with a fine warm moisture diffused over his skin, and every symptom favourable; at five in the morning, he was found dead in his bed; lying on his face, with nearly a gallon of red and yellow stuff, resembling blood and bile, under him, and which was still running from his mouth. On shifting him, to have him buried, his whole body emitted the most intolerable effluvia. He must have died suddenly, and without a groan; as three nurses sat up in the ward, and thought him asleep all night.*

CASE IV. Robt. Aldridge, Marine, *H. M. S. Centurion. Off Edam.*

18*th October*, 1800. Was seized last night with fever, ushered in by cold rigors. At eight this morning, skin clammy; head giddy; pulse small and quick; tongue white and furred; bowels uneasy, with pain about the umbilicus; a saline cathartic; after operation of the cathartic, camphor julep every two hours.

14*th*. Passed a tranquil night. At eight this morning, skin hot; severe pain in his head; stomach uneasy; an emetic of ipecacuan, which brought off much green bile; an anodyne antimonial at bedtime.

15*th*. At ten o'clock last night, a great exacerbation of fever, with delirium, which remitted at four this morning.

* This is a singular, though, I think, not inexplicable case. It furnishes at least one important reflection—namely, how easily may we be deceived by the phantom *debility*. Forty-eight hours *before* this man carried his hammock to the hospital,—"he lay on his back, his eyes and mouth half open—his pulse small and fluttering." Was not the debility here apparent, not real? Were not his powers oppressed—not exhausted? Else how could two short days of subsequent fever and delirium give him the almost miraculous strength—"to rise, take up his bed, and walk?" It is quite inconsistent with observation, that this could have been one of those fatal calms preceding death, from mortification of an important organ. In such cases, although the patient fancies himself relieved, or even that he is strong, there is little real force. The sound sleep, and warm moisture on the skin, are very incompatible with actual mortification. But if we advert to the state of the brain for several preceding days, we shall not hesitate to say, that effusion or rupture of vessels carried him off instantaneously.

The morning before, we see that he was seized with violent black vomiting which was checked by medicine. The return of this, when he was in bed, after the preceding exertion, and a great determination for some time past to the brain, has caused sudden rupture or effusion, which induced immediate death, or apoplexy ending in the same. Finally, was it not this *apparent debility* which prevented the exhibition of cathartics and mercury, so successfully employed in the preceding case?

At 8 A.M. complains of debility and head-ache; skin soft and perspirable; bark decoction every two hours; at noon became delirious; skin hot and dry; at 6 P.M. high fever; head much affected; great incoherence; pulse full; tongue foul; bowels costive; omit the bark; a saline purgative procured three stools; the draught at bedtime, as before.

16*th.* Passed a restless night. At eight this morning, high fever; severe pain in the head and stomach; internal burning heat in the epigastrium; calomel, gr. viij; pulv. ant. gr. ij; opii, gr. j; ft. bolus, ter in die.*—At 2 P.M. skin moist and warm; pain in the head and stomach; 6, P.M. became very hot and restless; pain in the region of the stomach severe, with intense burning heat there, both internal and external; calomel, &c continued.

17*th.* Was easy all night—passed two copious stools; skin was warm, with equally diffused moisture; at eight this morning, he is better; the pain has left his head and stomach; at 1 P.M. uneasiness in the region of the liver; *cannot bear the least pressure over it*; the calomel continued ter in die, as usual; at 3 P.M. stomach uneasy; black vomit (resembling coffee grounds, exactly); severe pain in the forehead; the effervescing draughts every two hours; added four grains of camphor to the evening dose of calomel.

18*th.* Restless night; *delirium; watery eyes;* skin changing yellow. This morning, complains of twitchings in the calves of his legs; collected and sensible when spoken to; calomel and camphor as before; blisters to his legs; at noon, skin cold and clammy; profuse perspirations; tried the bark in various forms; but the very sight of it made him vomit; the calomel and camphor continued ter in die; at ten P.M. sensible to the pain of the blisters.

19*th.* Slept a little last night; this morning, giddiness; skin of a bright yellow colour; took the bark with much per-

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* Too late. An active employment of mercury from the beginning, without any other aid than venesection and copious intestinal evacuations, would have had the patient now on the verge of ptyalism.

Let those who are disposed to cavil at some points of practice pursued here, particularly the exhibition of bark, and omission of venesection, point out from what sources the surgeon could have drawn a better *methodus medendi*. Certainly not from books; at least, not from the works of Bontius, Lind, Clarke, or Balfour. Nay, at this day, venesection is condemned and bark extolled! Dr. Bancroft, one of the latest writers on Yellow Fever, seems to rely principally on bark. Mr. Curtis, the last writer on the Diseases of India, boasts of having seldom "wet a lancet, except in specific inflammation."

If it be said, why did not *observation* point out the necessity of bleeding, and the injury occasioned by emetics and bark? I answer, by asking,—Why did not *observation* point these out long ago to those writers enumerated? Why did not Cullen find out the utility of purgatives in fever before Hamilton?

suasion; at 11 A. M. it made him sick, hot, and restless; bowels uneasy; abdomen tense and full; glysters brought away several fœtid stools, and stuff like grounds of coffee; took xxxiii grains of calomel to-day, but no appearance of its entering the system; skin of a deep yellow colour.

20*th*. Restless and delirious in the night; oozing of blood from nose and mouth, which tinged the linen yellow.* This morning, skin hot and dry; tongue brown; intolerance of light; head much affected; starts when spoken loudly to; says he is "very well," and seems much surprised at being asked the question; lies on his back, with mouth and eyes half open; pulse small and stringy; took xxxii grains of calomel to-day, with camphor julep.

21*st*. Symptoms as yesterday. In this state he continued for forty-eight hours, when the black vomit, with convulsions, carried him off, on the 23d October, the 10th day of his illness. Not the least symptom of ptyalism could be seen, though he took calomel to the last hour.—He had done duty on shore, both at Cuypers and Onrust, where he lived very intemperately.†

CASE V. Mr. Thos. F. Carter, *from Edam.*

October 26*th*, 1800. Has been six days ill with the Batavian fever on Edam Island, and sent on board at six o'clock this evening, in hopes that change of air may mitigate the disease.

He now complains of coldness in the lower extremities; bad taste in his mouth; a troublesome purging; great dejection of spirits; pain in his head and epigastric region; pulse small and quick; frequently delirious before he came on board; had taken bark in various forms at the hospital, without any benefit; on the contrary, he daily got worse. The emetic-cathartic solution was given him this morning on shore which is still operating; as he was much fatigued by coming on board, gave him a glass of port wine, and the camphor julep.

27*th*. He was delirious and sleepless all night; skin hot and dry; the solution continued to operate in the night both ways, and he passed several fœtid stools. At nine this morning, all the symptoms worse; talks in the most incoherent lan-

* If this be not a case of "*Yellow Fever*," I know not what is.

† Was there not effusion in the brain here, as well as derangement in the liver?

guage; tongue very foul; *pulse full and quick*; complains of great pain over the orbits and sinciput; pain and burning internal heat at the stomach; calomel, gr. viij; camphor, gr. iv; opii, gr. j; ter in die;* a blister inter scapulas.

28*th*. First part of the night restless; latter part quiet, and slept a few hours. At nine this morning, all the symptoms aggravated; delirium; *full, quick pulse*; pain over the orbits, and in the sinciput; right eye much inflamed; blister rose well; is sensible to the pain of it; same treatment as yesterday.

29*th*. Delirious all last night; talks incessantly this morning, in very incoherent language; says he feels as if he had two heads; his eyes cannot bear exposure to the light;† has frequent convulsive twitchings of the tendons; repeated the calomel this morning; he drank a little brandy and water, which he relished much; at 8 P. M. very restless; skin hot and dry; tongue foul; twitchings of the tendons; right eye much inflamed, and prominent; had one fœtid, bilious stool; when asked how he does; replies, "Very well;" and that nothing is the matter with him; his mind constantly employed about the ship's duty and prize stores; his countenance singularly wild and sallow: omit the calomel; pediluvium; diaphoretic powders of camphor and nitre; diluents.

30*th*. Very restless all last night; with great difficulty could be kept in bed, preferring the cold deck; was highly delirious; right eye prominent, and much inflamed; complains of pain in the calves of the legs; blisters to his legs; gave him a brisk dose of calomel and jalap, which operated, and brought off two copious fœtid stools; at noon, he is much more composed;‡ complains of strangury from the blisters. Semicupium and sp. æther. nitros. gave relief to this symptom; great deafness; clammy, profuse sweats; small, weak pulse; bark and claret; the calomel to be again renewed. At 6 P. M. his right eye still inflamed, red and prominent; pulse full; violent delirium subsided; *half an*

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* This is the seventh day of the disease—greatly too late!

† There are evident symptoms of congestion, if not inflammation in the brain here. This oppressed state of the sensorium renders the absorbent system so torpid, that there is no chance of the mercury being taken into the constitution. Evacuations, under these circumstances, by relieving the brain, invariably accelerate ptyalism.

‡ Although evacuations always gave more or less relief in this fever, yet the idea of *debility*—that unlucky term—seems ever to have cramped their employment.

ounce of bark, and a pint of claret, since morning, which his stomach retains.*

31*st*. Very restless all night, with *raging high delirium*; great difficulty in confining him to his bed; tongue and lips brown and crusted; stomach tense, with burning internal heat in the epigastrium; right eye red and prominent; at one o'clock this morning, a blister renewed to the back of his head; the calomel and jalap repeated; at six this morning no better; right eye inflamed, prominent, and seems *starting out of his head,* with other symptoms of a highly deranged state of the brain; *neither the blister nor purgative has taken any effect*;† two large yellow blotches have appeared on his neck; I am forced to keep him lashed down in his bed, as he made several attempts to get overboard; tore the blisters from his head; constantly grasping at every object; great deafness; no recollection of any person; his mind still employed about his accounts, and the ship's duty; strong convulsive spasms of the whole body; so that it often requires two men, with all their strength, to keep him down;‡ the raging high delirium sunk hourly, till, a few hours before death, when we could hardly hear him articulate; he was carried off with hiccup and convulsions next night, his body very little reduced, and without the least disagreeable smell.

Previously to the attack of fever, he was constantly employed on shore at the island of Edam, where he had charge of the prize-stores, and where he frequently exposed himself to the intense heat of the sun by day, and the noxious influence of the air by night; he used to sleep at the hospital; he died on the 11th day of his illness, six days after he came on board.

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* "The prejudices that formerly existed against the Peruvian bark, in fevers," says Dr. Hunter, "are no longer in being." "They were founded in "*idle speculations*, and originated with the learned, from whom they descended "to the great body of the people; but even with the *vulgar* they are now ex- "tinct." *Diseases of Jamaica, page* 122. At page 98, we have this remark, "In almost every case where the disease is *violent*, and the patient much re- "duced, it (wine) is highly grateful and cordial. It is of the utmost conse- "quence, in giving both nourishment and wine, that they be repeated often."

Dr. H. recommends about a pint a day, in small quantities at a time, and the same of food. Who can blame the surgeon for pursuing a plan recommended by such authority? And, as I observed before, where has he any better instructions in fevers of the East?

† The torpor alluded to is here manifest—and there can be little doubt of its dependence on oppressed sensorium.

‡ With the strength of two men the day before death—his body unreduced—and where mad delirium, and eyes starting from their sockets, declared the state of the brain, I should have been tempted to bleed *usque ad deliquium*, or the relief of the symptoms, *coute qui coute*.

CASE VI. Mr. HAMMOND, Captain's Clerk. *Off Edam.*

October 23rd, 1800. Was in the habit of being much on shore at Edam Island during the day; but never passed a whole night there; seized last evening with the usual symptoms of the Batavian fever; head much affected; great pain over the orbits; took the emetic-cathartic solution, which operated well; at night the anodyne antimonial.

24*th*. Passed a restless night; his bowels very uneasy; this morning he is very ill; all the symptoms violent; small, hot, bilious stools; the solution as yesterday, which operated both ways; at night the draught repeated.

25*th*. Passed a very bad night, with violent pain in the head and epigastric region; hot, dry skin; quick pulse; great inquietude of the system at large; could not rest a moment in one position; foul tongue. This morning, all the symptoms the same as during the night; calomel, gr. viij; pulv. ant. gr. ij; opii. gr. j; three times a day.* At 8 P.M. he appears a little more composed.

26*th*. Had a violent paroxysm of fever in the night, ushered in with cold rigors. This morning, he is very poorly indeed; distressing bilious purging; countenance sallow and anxious; all symptoms appear exceedingly unfavourable; continue the same treatment.

27*th*. Passed a bad night; no alteration for the better; head-ache intense; pain in the epigastric region; hot, dry skin; pulse quick; dysenteric purging; medicine continued.

28*th*. No alteration; had a violent exacerbation of fever to-day, ushered in, as before, with rigors; continued the same treatment; no appearance of ptyalism.

29*th*. Mouth sore. All the symptoms alleviated; head-ache, and pain in the epigastric region, diminished; bowels easier; calomel bolus twice a day only.

30*th*. Mouth sorer; all the bad symptoms disappearing; complains only of debility; decoction of bark and wine.

31*st*. Mouth very sore; spits copiously; keen appetite; omit the calomel; put him on the convalescent list, with wine, and nourishing diet; from this time he recovered rapidly. This case was treated entirely with mercury.†

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* This is the fourth day of the disease, counting the evening of the 22nd as one.

† It would be difficult to conceive how a more unequivocal proof of the efficacy of any medicine could be given, than is afforded in this case. I had set it down as lost, till I saw the words "*sore mouth*," on the 29th, which dispelled my fears; for well do I know, from personal feeling, what *ease* this *soreness* brings.

CASE VII. Mr. POWEL, Master's-mate. *At Edam.*

November 13*th*, 1800. Was attacked with fever yesterday, on shore, at the island of Edam, where he has resided, in charge of the prize-stores, since the death of Mr. Carter. This morning, complains of the usual symptoms; pain and giddiness of the head; hot skin; cold extremities; quick pulse; the emetic-cathartic solution; after the operation of which, the anodyne antimonial.

14*th*. Restless night; was much purged; cold sweats, burning, acrid heat at the pyloris; pain over the orbits; six grains of calomel, and one of opium, thrice a day; also the camphor julep every three hours; port wine or porter, as much as he can take; cold ablution; at 6 P. M. symptoms nearly the same; had many fœtid, bilious stools, during the day; spirits greatly dejected; cold sweats on the extremities; pulse small, quick, and fluttering; tongue brown and crusted; great apprehension of death; bark.

15*th*. No rest all night. This morning, all the symptoms worse. At 10 A. M. the fatal black vomit has appeared; cold sweats; delirium; omit the bark, which will not lie on his stomach: repeat the calomel; æther and laudanum draughts every two hours; evening, the vomiting checked a little; blisters to the head and stomach; skin begins to change yellow; breath becomes fœtid; every symptom unfavourable.

16*th*. No sleep last night; worse in every respect this morning; he sinks hourly; low delirium; muttering; lips and teeth encrusted black; breath fœtid; insensible; lies on his back, mouth and eyes half open; skin intensely yellow; pulse small and fluttering; same treatment.

17*th*. Black vomit all night; cold sweats this morning; tongue black; pulse fluttering; singultus; eyes glassy; breath very fœtid; stools involuntary, and black, like coffee grounds; lies on his back, eyes and mouth half open; carried off, in an attempt to vomit.*

WADE SHIELDS.

The foregoing cases, selected out of an immense number, will be sufficient to convey a very accurate idea of this endemic, and to support the remarks and general description

* Will any one assert, after reading this, and many other cases here, that the "*Yellow Fever*," never appears in the East?

which preceded them. I have exhibited more fatal than favourable terminations; as the former must include the whole range of symptoms, from health to death, and ascertain the inefficacy of measures in which we might be apt to place too much confidence.

It certainly will not be denied, that this is a very interesting and valuable document, as it gives us a much clearer view of the Batavian fever, than any English work in circulation; accompanied with numerous collateral incidents and observations, that excite reflection, while they strongly rivet our attention.

I shall glance hastily at some prominent traits in the character of this fever, with a few remarks on its cause, leaving the reader to form his own conclusions.

In the first place, the great similitude which it bears, in most of its leading features, to the endemic of the West, cannot have passed unnoticed. Independently of the yellow skin and black vomit, they coincide in many minor, but characteristic symptoms; for instance, the mental despondency, amounting to timidity, at the beginning, veering round to nonchalance or apathy, in the progress of the disease.

That fatal lull, and occasional sensation of hunger too, which are so apt to deceive the inexperienced in the Western endemic, frequently appeared in that of the East. Neither would it seem very difficult to account for their discrepancies. For whether we allow that these endemics are solely caused by the local miasmata, or are the bilious remittents of hot climates, resulting from atmospherical influence, but aggravated by these invisible agents; still, in either case, as the cause, or combination of causes, must vary according to the nature of the climate and soil, so we cannot expect to have their effects agreeing in every minute particular. Nevertheless, as the operation of these causes on the human frame appears to be nearly the same in all climates, we can clearly discern (in the broad outline of their effects) a strong family likeness through the whole ghastly tribe.

> "————————facies non omnibus una
> Nec diversa tamen, qualis decet esse sororum."

The opinion that these grand endemics (yellow fever, for instance) are only the bilious remittents of all tropical climates in a more concentrated state or degree, is founded, I fear, on too great a rage for generalising. The bilious remittent may take place an hundred leagues at sea, in consequence of atmo-

spherical vicissitudes acting on particular organs, whose functions were previously disturbed by atmospherical heat. The endemic, on the other hand, is produced by a specific miasm, (witness that of the fatal island Edam) which, independently of all those peculiar states of the air, or the body, requisite for the production of bilious remittent, will, when in a condensed form, kindle up, at any season, and in any constitution, a fever of terrible malignity.

These diseases then, may be often—perhaps generally combined; since their causes acquire force and subside, *pari passu*, and at the same period of the year. But assuredly they are sometimes totally distinct, and quite unconnected with each other.

This reasoning is corroborated by the fact, that time, (for instance, eighteen months or two years in the West Indies) will accustom the human frame to the action of the febrific miasm, and thereby secure it, generally speaking, from the endemic; but no number of years is a protection from the bilious remittent.

The circumstance of the Dutch officers and Malays falling victims at Edam, might seem to militate against this doctrine; but the objection vanishes, when we recollect, that by previously residing in the country, entirely out of the sphere of the local effluvium, they were in reality no more seasoned to it than the English; and the mortality in the garrison proved it. They were in the same situation as the native or veteran West-Indian, who, by spending a few years in Europe, or the interior of the country, loses his protection against a visitation of yellow fever on his return to the sickly towns.*

Neither will residence in one tropical climate prove a security against the local endemic of another, as the above circumstances themselves render evident. Thus the crew of a ship, that has been two or three years on the Coast of Guinea, and sails direct from Sierra Leone to Barbadoes, which are nearly in the same parallel of latitude, will be as liable to yellow fever, as if they had sailed from England; while a two

* Dr. Fergusson in mentioning the fatal yellow fevers which ravaged the West India Islands in 1815, states—"In all it has been confined, for the most part, to the towns, and except at Bridge-town, to unseasoned Europeans. There it extended to unseasoned sojourners—even to *Creoles from the interior of the country*, who, in the time of the insurrection, were obliged to resort to the town on military duty." *Med-Chir. Trans. vol.* viii. *p.* 144. Again, Mr. Dickenson, Surgeon, to the Forces, states in the 48th Number of the *Medical Repository*, that—"Dreadful were the numbers the writer saw under the mortal grasp of marsh fever at Prince Rupert's Dominico. *They were subjects assimilated to the climate, although strangers to that particular station.*"

years' station in the West Indies would have almost insured a subsequent exemption.

Indeed, the plan of seasoning troops against *yellow fever*, by stationing them for some time previously, at Gibraltar, Madeira, or in the Mediterranean, has completely failed; and how could it be otherwise, if the Coast of Guinea itself is no protection? a melancholy proof of which was exhibited in H. M. S. Arab, in 1807; which ship came from the latter place (where she had been nearly two years) to the West Indies, and suffered dreadfully by the yellow fever.*

These facts (particularly the last) must go far to dissolve the theory of the ingenious Dr. Bancroft, who has laboured to prove, that "the security from the disease (yellow fever) is "principally derived from the *ability to endure great heat.*" *Essay on Yellow Fever, page* 265. The dangerous consequences which might obviously result from trusting to such a protection, as well as Dr. B.'s candour and humanity, will induce him to re-consider the subject. The officers and crew of the Arab, on their arrival in Carlisle Bay, considered themselves perfectly seasoned and secure; but on putting to sea, in the course of a month, the endemic broke out with such violence, that in one week they lost thirty-four men, and were forced to put into Antigua, in the greatest distress.

Dr. Bancroft, indeed, is not singular in his opinion, which appears to be copied from Dr. Trotter [Medicina Nautica, vol. 1, page 336] who has *theorised* widely on a foundation which the foregoing *facts* completely overturn. Dr. T. probably took the doctrine from Dr. Moseley, who tells us, that a seasoning at *Bermudas* will secure us from the yellow fever of the *West Indies*, p. 65. Let no such plan be trusted.

The locality and range of this febrific miasma, are clearly decided by the Dædalus. Her ship's company breathed the same general atmosphere as the other crews, for months together; but, with the exception of the purser and surgeon, no man belonging to her came within the fatal circle (in the night, at least) though seldom more than two or three miles from its centre. The officers abovementioned exclusively felt its influence, aud like too many others, fell victims to its direful force. It is probable, however, that where a trade wind or

* "It is certain that if having had the West India yellow fever secures an exemption from the Gibraltar one, this last gives no security in kind. Captain "Johnson, of the Queen's regiment now here, had the Gibraltar fever in 1804, "and he has just now recovered with difficulty from a very alarming attack of "the prevailing Epidemic." *Fergusson on yellow fever, Med. Chir. Trans. vol. viii. p.* 124.

monsoon sets over a large tract fraught with febrific miasmata, these invisible agents may be carried to a much greater extent than where calms or gentle sea and land breezes prevail. This is exemplified in the fever of Coimbatore, [Sec. 3.] and ought ever to be borne in mind by navigators in anchoring ships in the vicinity of swamps, or generals in pitching tents or stationing troops. The direction and prevalence of winds are ever to be coupled with the medical topography of a place.

This document furnishes decisive evidence on two points of great practical importance. One is, that even within the limited range of this poison, its power is nearly inert, comparatively speaking, during the day; the other, that when nocturnal exposure has given rise to the disease, it is non-contagious. It is obvious what an influence the certain knowledge of these circumstances must have on our conduct, and to what useful purposes we may apply it.

In this, as in all other violent endemics, the head and epigastric region were, as usual, the foci of the disease. The inutility, or rather the injury of every other medicine, than mercury and purgatives, was abundantly manifested. But with all due deference and respect for the surgeon, and a proper allowance for the embarrassing situation in which he was placed, I conceive that the first remedy was not applied early enough, or with sufficient boldness; and that the purgatives, through a false fear of debility, were not so frequently administered, as their evident utility warranted.

In the solitary instance where venesection had a trial, the hasty conclusion which was thence formed of its pernicious effects, in consequence of the sudden death and putrescency of the patient, deserves a remark. If the reader will revert to Joseph Hughes, (Case III.) who, after dressing himself in good spirits—going into the boat without assistance—carrying his hammock up to the hospital—retiring to bed, and falling into a sound sleep, was nevertheless found dead in the morning, "his body emitting the most intolerable effluvia;" he will probably agree with me, that had this man been bled on entering the hospital, his death might have been attributed to venesection, with as much *apparent* justice, as any *single* incident could support.

This may serve as a lesson to us, how wary we should be in rejecting entirely a powerful remedy, from solitary or even several failures. For how difficult is it, in such cases, to say with certainty—such is the successful, and such the unsuccessful medicine! The prejudice against bleeding (seemingly

justified by this event) was engendered too, by "accounts which had been read of its bad effects in fevers of the West Indies;"—fevers in which its pre-eminent service is now ascertained beyond the shadow of doubt.* From all these considerations, and from an attentive examination of the symptoms themselves, we may conclude, that venesection deserves a much further and fairer trial in this fever; and I entertain little doubt, that it will be found a powerful auxiliary to the other means of cure.

Of the efficacy of mercury, under all its disadvantages, I need say little. There is the decision of the surgeon himself, who treated nearly 200 cases of the fever—there are specimens of these cases detailed—and there is a strong proof of the dependence placed on this remedy, where we find the surgeon himself confide his own life to its power, when attacked by the fatal fever of Edam. I would, however, recommend it to be used in the early and liberal manner pointed out in the Bengal endemic, with the same attention to venesection and intestinal evacuations. The ptyalism should be copious, and more or less of it kept up till strength be completely restored. The cold affusion bids fair, during the reaction; and, at all events, cold applications to the head, with warm pediluvia, will invariably prove serviceable.

The opinion of Dr. Cullen, that the influence of the remote cause ceases when the fever is once formed, is here proved to be not only erroneous, but dangerous. Removal from the sphere of its action, during fever, invariably protracted the fatal catastrophe; and could the patients have been transported quickly into a pure air, while ptyalism went on, they would, in all human probability, have survived, as the surgeon himself believed.

One remarkable incident remains to be noticed, and cannot have eluded the observation of the reader. I mean the circumstance of the four *mercurial* patients, who resisted the baleful influence of Edam. Such an immunity cannot be attributed to chance. The proofs are both positive and negative. *They, and they only, escaped the fever.* It accords with my own experience; for I have not known a person fairly under the influence of mercury, for the cure of

* What will the reader think of the following passage in a modern publication?—"In such cases as seemed most to require it; (blood-letting) for example, where the patient was young, strong, of a full habit, and lately arrived from Europe: where the pulse was quick and full, the face flushed, with great heat and head-ache; and all these at the beginning of the fever, *bleeding did no good.*"—*Hunter on the Diseases of Jamaica, 3rd edition, page* 118.

any other complaint, to be attackad either by endemic or contagious fever. I have seen several, who were reduced by long courses of mercury previously, and who had left it off, fall victims to fever and flux; but not during the exhibition of the medicine. We know that a slight, or even a free ptyalism, may be kept up for weeks together, without any serious injury to health; and if such a state proved an antidote (as it did here) against the most powerful cause of fever that ever, perhaps, had "a local habitation, or a name," the inconvenience of the prophylactic is very trifling, compared with the security it may afford. The rationale of the preservative is not very unreasonable. If it cure the disease, it *may* also have some power in preventing it. Bark was formerly considered capable of both—(witness the peruvian drams that used to be served out to wood-cutters in hot climates); fatal experience has proved it equal to neither! Mercury, by keeping up the action of the extreme vessels on the surface, and in the hepatic system, prevents, what I conceive to be the paramount effects resulting from the application of febrific miasmata—INEQUILIBRIUM IN THE BALANCE OF THE CIRCULATION AND EXCITABILITY, AND CONGESTION OR INFLAMMATION IN ONE OR MORE OF THE INTERNAL ORGANS.

It is proper to observe, however, that many medical men of talents and observation, deny that mercury is possessed of any prophylactic power. I only state what has come to my own knowledge on the subject.

DISORDERS OF THE HEPATIC SYSTEM.

SEC. IX.—"The exclusive efficacy of mercury," says Dr. Saunders, "in liver diseases of the continent of India, may "perhaps be explained, by supposing they arise from an *in-* "*digenous and local poison, or miasma*, peculiar to that "country, unlike any thing known in any other part of the "world, even under similar latitudes and temperatures."

Had this ingenious and deservedly eminent Physician ever visited the continent alluded to, his penetration would have discovered the cause of this phenomenon, without the aid of an "indigenous poison," which, like the introduction of an epic divinity, is a more poetical than philosophical mode of extricating ourselves from difficulties, and *loosing* the gordian knot.*

In order to clear the way for this investigation, it is necessary to inquire, whether this "endemic of India" be equally prevalent in all parts of that vast empire. Here universal evidence gives the negative; and every one, in the least acquainted with the medical topography of the country, knows, that genuine, or idiopathic hepatitis, is ten times more prevalent on the Coast of Coromandel than on the plains of Bengal; while, on the other hand, intermitting and remitting fevers are ten times more numerous in the latter than in the former situation. Let us next see, if there be any particular difference in the climates and temperatures of these two places. By exact thermometrical observations made at Calcutta, by Mr. Trail, during a whole year, the following appears to be the monthly medium heat of three different diurnal periods—morning, noon, and evening.

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* See the Section on Egypt in a subsequent part of this Work, where Hepatitis is proved to be equally as prevalent on the Banks of the Nile as on the Coast of Coromandel. Hepatitis is very prevalent also on the Coast of Africa, where the heat is excessive.

TABLE.—No. I†.

January.....	66°	May.....	84°	September...	82½°
February...	74	June.....	83	October....	82½
March.....	79	July.....	83	November...	76
April.....	86	August.....	82	December ..	68
Annual Average, 78½ Fahrenheit, 1785.					

Let us compare this with the heat at the presidency on the coast.—The following is copied from the Madras Gazette, shewing the state of the thermometer at the Male Asylum, during one week in July 1804, which was by no means remarkable for any extraordinary range of temperature.—

TABLE.—No. II.

State of the Thermometer at the Male Asylum, Madras.

1804.	7 A.M.	Noon.	3 P.M.	8 P.M.	Average.	Remarks.
July 11....	81	88	89	85	86	
12....	81	88	90	86	86¼	
13....	81	91	92	86	87½	"The thermometer is placed in a room moderately exposed to the weather, and facing the North-west."
14....	82	90	93	84	87¼	
15....	83	91	94	88	89	
16....	84	92	95	91	90½	
17....	85	94	96	91	91½	
Total Average, 88½.						

† Vide 2d vol. Asiatic Researches.

Now it is well known, that, excepting for a few weeks at the change of the monsoon, in October and November, the Coromandel coast is remarkable for a cloudless sky and steady temperature, all the year round; the heat, however, being often above the specimen exhibited, as the following table from Dr. Clark will shew.

TABLE.—No. III.

State of the Thermometer on board the TALBOT *Indiaman, in Madras Roads, from the 24th July to the 23d August,* 1771.

Month.	Day.	Hour.	Ther.	Month.	Day.	Hour.	Ther.
July	24	12	90	August..	8	7	96
		6	96		9	12	89
	25	12	88			4	87
	26	12	90		10	12	93
		3	93			4	88
	27	12	90		11	2	94
		3	93			4	89
	28	12	90		12	12	93
		3	92			4	90
	29	12	93		13	12	90
		4	96			4	87
	30	12	90		14	12	89
		4	94		15	12	89
	31	12	91			3	90
		4	93		16	12	90
August..	1	12	93			4	94
		4	94		17	12	94
	2	12	92		18	12	93
	3	12	90		19	12	90
		3	91			4	87
	4	12	90		20	8	90
		4	92			3	94
	5	12	92		21	8	92
		4	94			3	95
	6	12	89		22	11	94
	7	12	90			4	87
		5	92		23	10	86
	8	12	93			3	88

Total Average, 91°.

Dr. Clark remarks that, "on account of the sandy soil of Madras, it was found moderate enough to allow a thermometer to rise six or seven degrees higher ashore." This would make the average, for a month in succession, 97 or 98°.—*Vide Clark on Long Voyages, page 56 et seq.* Mr. Curtis, speaking of the Coromandel coast, where he remained on shore more than a year, observes—"Except for two or three weeks about the shifting of the monsoons, especially that which happens in the month of October, a shower of rain, or a breeze, are (is) almost unknown; scarce ever a haze or cloud appears upon the horizon, to mitigate the dazzling ardour of an almost vertical sun; and the thermometer, through *the whole twenty-four hours*, seldom or never points under 80° of Fahrenheit, but generally *far above it*." Introd. p. xvii. How far above 80 it generally points, the preceding tables will clearly evince.

The nature of the soil is such, that while the sun is above the horizon, it acquires a much superior degree of temperature to that which the plains of Bengal attain; in consequence of which, the nights are often hotter than the days, when the land-winds prevail in May, June, and July. I have seen the thermometer stand at 105° of Fahrenheit, at *midnight;* and that too on board a ship riding at anchor in Masoolipatam Roads. Many causes combine to produce so much higher a range of atmospherical heat in the Carnatic than in Bengal. First, the coast in question trends away towards the equinoctial line, while a great part of Bengal lies *without* the tropics. Secondly, the soil of the former is gravelly or sandy, and vegetation stunted; whereas that of the latter is clayey, and vegetation luxuriant. Thirdly, the periodical rains that fall, at the change of the monsoon, on the coast, are instantly absorbed by the parched and sandy surface, affording only a very temporary coolness to the air; while an actual and extensive inundation covers Bengal for months together. If, therefore, the nocturnal temperatures of the two places were blended with the diurnal—if, for instance, the thermometer were marked every hour at Madras and Calcutta throughout the year, and the whole averaged, there would be full *ten degrees difference* in the annual mean temperatures of the two presidencies. Bombay is nearly on a par with Calcutta; for although the country surrounding the former is neither flat nor inundated, as in Bengal, yet its northern parallel of latitude, its insular situation, and the mountainous nature of the

adjacent country, combine to render the average annual temperature of Bombay as low, if not lower, than that of Calcutta.*

An important, yet unnoticed circumstance, remains to be considered, in estimating the comparative influence and effects of the two climates.—Although *sudden* vicissitudes of temperature are highly injurious to the constitution, in general, and to the hepatic system in particular; yet an *annual* change is eminently beneficial. Thus, the first table shews us, that at Calcutta, during four months of the year, viz. November, December, January, and February, the average heat of the day is only 71° Fahrenheit, five degrees *below* the common summer heat of England. As for the nights, I can vouch for their being cooler than summer nights at home; since a hoar frost is not an unusual sight on the plains of Bengal, in the mornings of this period; and very gratifying have I found the heat of a blanket at Calcutta in the month of December.

Thus the Bengalese, and those in similar parallels of latitude, enjoy a kind of *tropical winter*, or exemption from high ranges of temperature, during *one-third* of the year; the effects of which, in relieving the hepatic system from excessive action,—in bracing the whole frame, relaxed by the previous heats, and preparing it to sustain the subsequent ones, may be compared to a short return to our native skies.

This remark will be confirmed by the following analogical observations of Dr. Darwin. "Though all *excesses* of increase and decrease of stimulus should be avoided, yet a certain *variation* of stimulus seems to prolong the excitability of the system: thus, those who are *uniformly habituated to much artificial heat*, as in warm parlours in the winter months, lose their irritability, and become feeble, like hothouse plants; but by frequently going for *a time* into the cold air, the sensorial power of irritability is accumulated, and they become stronger. Whence it may be deduced, that the *variations* of the cold and heat of this climate (England) contribute to strengthen its inhabitants, who are more active and vigorous than those of either much warmer or much colder climates."—Zoonomia.

Knowing then, as we do, how uniformly a high temperature affects the biliary organs, and keeping the foregoing facts in view, can we be at a loss to account for the

* Vide Dr. M'Grigor's Memoir, Edin. Med. and Surg. Journal.

greater frequency of genuine hepatitis in the Carnatic, than in Bengal?—I say genuine, or original hepatitis; for most of those cases which we meet with at the latter place, are the consequences, or sequelæ, of repeated intermittents and remittents, both marsh and jungle.

The same reasoning applies to Bombay, and all other parts of India, whose distance from the equator produces a *tropical winter*, when the sun is near Capricorn; or where peculiarity of soil, elevated situation, or other locality, is incompatible with that high, and almost unremitting range of temperature, so remarkable on the Coromandel coast, and so fully adequate to the derangement of the hepatic functions.

Having thus explained, in I trust a satisfactory manner, the nature of this "local poison," and how it comes to operate more forcibly in one part than another of the Indian continent, it is necessary to shew why, even in the less sultry parts of the latter—for instance, Bengal, the complaint is still more prevalent than under similar latitudes in the West.

Dr. Saunders quotes, in support of his hypothesis, the following observation from Hunter on the Diseases of Jamaica. "It is a remarkable thing," says the latter, "that "in the East Indies, under the same latitude *nearly* as Ja- "maica, that is, at *Madras and Bombay*, the disease known "in those countries by the name of Liver, or Hepatitis, shall "be the most prevailing disorder among Europeans, and that "the same should not be known in the Island of Jamaica." In the first place, there is a geographical error in classing Madras and Bombay in similar latitudes. In the second place, I assert, that there is a difference of ten degrees in the annual mean temperatures of the two places, taking the *hourly average height of the mercury, by day and by night, throughout the year*. In the third place, hepatitis is by no means the most prevailing disease among Europeans at Bombay; dysentery being infinitely more common* But further, the Island of Jamaica, from its situation in the vicinity of Cancer, must have its "tropical winter," as well as Bengal, and at the same period; while its insular nature, and distance from the American continent, insure it the advantage of sea and land breezes,—the *former* coming in *cool* and refreshing, in every direction, from the sea by day; the latter descending *cold* from the blue mountains by night.

* If I afterwards trace a connection between dysentery and deranged hepatic function, it will not invalidate this position; as the same observation will apply to the dysenteries of the West.

On the contrary, in Bengal, the land-winds are so distressing in April and May, as to oblige the Europeans to sit behind tatties, for weeks together, to avoid being stifled with heat and dust. It is far otherwise in the West. Indeed it is computed by Dr. Mitchell, after thirty years observation, that it is as hot in the countries of the old continent, in latitude 29 or 30, as in the countries of the new continent which lie in 15 degrees of latitude. M. de Paw makes the difference between the old and new continents, in respect to temperature, amount to 12° of the thermometer.—*Recherches Philosophiques.*

" The vernal season in these parts," (West Indies) says Mr. Edwards, " may be said to commence with May.— " The parched savannahs now change their aspect, from a " withered brown to a fresh and delightful green. Gentle " southern showers presently set in, which, falling about " noon, occasion bright and rapid vegetation. At this " period, the medium height of the thermometer is 75°.— " After these vernal showers have continued about a fort- " night, the season advances to maturity, and the *tropical* " *summer* burns in its full glory. During some hours in the " morning, before the sea-breeze has set in, the blaze of the " sun is fierce and intolerable. But as soon as this agree- " able wind arises, the extreme warmth is abated, and the " climate becomes even *pleasant* in the shade. The ther- " mometer now stands generally 75° at sunrise and 85° at " noon.*

" But whatever inconvenience the inhabitants of these " islands may sustain from diurnal heat, is amply recom- " pensed by the beauty and serenity of the nights: the " moon rises clear and refulgent in the cloudless horizon "—the landscape is fair and beautiful—*the air cool and deli-* " *cious.*

" In November or December the north winds com- " mence; at first attended with heavy *showers of hail*, till " at last the atmosphere brightens, and the weather, till " March, may be called *winter.* It is a winter, however, " remote from the horrors of northern severity:—*cool,* " *wholesome, and delicious.*"—*History of the West Indies.*

Let this description be compared with that of the coast of Coromandel, and we shall see how easy it is to make a

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* Compare this with table No. II.—85° in the morning, 96° at noon.

sweeping classification of climates on paper, where little similarity exists in nature.

To return. The average thermometrical range of heat ought to be, and really is, lower at Jamaica by three degrees than either at Bombay or Calcutta; and if so, how much lower than at Madras? In Jamaica, too, though the rainy season may leave swamps and marshes at the debouchures of rivers, yet there is nothing like the great annual inundation of Bengal, occasioning such numerous intermittents, that too frequently terminate in hepatitis.

Here then are the real causes why the last-mentioned complaint is more observed, and indeed more prevalent, in the East than in the West; viz. the great superiority of temperature on the Coromandel coast:—and the frequency of intermittents and remittents on the marshy plains of Bengal, or woody and jungly districts of other provinces, as well as of Bombay and Ceylon. To these may be added, the more sudden and extensive transitions of temperature, which take place on the continent of India, than in the islands of the West, owing to the greater degree of equilibrium preserved in the latter places by the surrounding ocean.

"In Jamaica (says Dr. Hunter), the *coolest* month in "the year is at least *twelve degrees* hotter than the *hottest* "month in our summers." page 174, 3rd ed. Now the *common* summer heat of England is 76°; consequently the thermometer must stand at 88° in the "*coolest month*" at Jamaica; and that too when there are even "showers of hail," and when the weather is "cool, wholesome, and delicious!" Let us compare this with Dr. Blane's account of the West India temperature:—"The thermometer stands "very commonly at 72°, at sunrise in the cool season; "rising to 78° or 79° in the middle of the day. In the hot "season, the common range is from 76° to 83°. It seldom "exceeds this in the shade at sea, and the *greatest* height "at which I ever observed it in the shade, at land, was 87°." *Diseases of Seamen, page* 12.

In a very interesting "Account of Jamaica," published in 1808, by a gentleman twenty-one years resident at that island, it is distinctly stated that "the medium temperature "of the air may be said to be 75° of Fahrenheit." *page* 21.

In the very same page, with some inconsistency, Dr. H. contradicts his own statement. "It was *hotter*," says he, "than common in the month of June, by *three or four de-*

"*grees*, the thermometer rising many days to 90°, an unusual heat in that climate." If we take "three or four degrees" from 90°, we shall have 86° or 87°, what Dr. Blane states for the month of June in Jamaica, whereas, he just before made the heat 88° in the "*coolest* month in the year,", which is nine or ten degrees too much.

I may here remark, that it must have been from *data* similar to the above, that Dr. H. drew another conclusion—namely, that atmospherical heat has no effect in increasing or deranging the biliary secretion. *Page* 277. I shall merely place his opinion in juxta-position with that of his friend who quotes him.

Dr. HUNTER.	Dr. SAUNDERS.
"A warm climate, it is alleged, increases the secretion of bile, and renders it more acrid. There does not appear to be the slightest foundation for this assertion."—*p.* 277.	"Such symptoms as I have now enumerated (viz. increased and vitiated secretion of bile) are the spontaneous effects of a warm climate on healthy constitutions, independently of any intemperance."—*On the Liver, p.* 159.

Every author with whom I am acquainted, excepting Dr. Bancroft, and every one who has observed, or felt the effects of warm climates on his own constitution, will agree with Dr. Saunders.

Lastly, notwithstanding Dr. Hunter's assertion, that "Hepatitis is unknown in Jamaica," when we see so many sallow complexions—emaciated dysenterics—nay, obstructed livers, every day returning from the West Indies; when we hear Dr. Moseley, who practised twelve years in Jamaica, assert, that in hot climates a sound liver is never to be expected after death; and Dr. Thomas, another West India practitioner, make use of these expressions—"My own observations, during a practice of *many years* in the West Indies, where Hepatitis is a *frequent* occurrence," &c. &c. [Modern Practice of Physic] we may safely conclude, that in the endemic fevers, particularly the intermittents and remittents of both hemispheres, the hepatic system suffers proportionally in the Islands of the Caribean Sea, as well as on the banks of the Ganges, or in the forests of Ceylon. Indeed, Dr. H. himself admits, that enlarged and obstructed livers are frequently the sequelæ of intermittents

in Jamaica.* Such, it is well known, would obtain the appellation of Hepatitis in Bengal; but Dr. H. will not allow the term, because, forsooth, these affections of the liver are not very apt to run into suppuration. Many people, indeed, cannot be persuaded that the hepatic functions are at all deranged, unless Hepatitis, *in propria forma*, be present.—Is the stomach never disordered except in *gastritis?*

Having ascertained the *quo*, we now proceed to the *quomodo*. I have more than once in this essay alluded to a sympathy, or synchronous action, subsisting between the extreme vessels on the surface of the body, and those of the vena portarum in the liver; a sympathy which, as far as I am acquainted, has not been noticed by any other; and which, if proved, will account for the increased secretion of bile in hot climates, and lead to important practical conclusions. It is, however, in those climates alluded to, where the vessels in question are more violently stimulated than in Europe, that we can most easily and distinctly trace this sympathy. I have remarked, that when we first arrive between the tropics, the perspiration and biliary secretion are both *increased;* and that, as we become habituated to the climate, they both *decrease, pari passu.*

It is very singular that the accurate Bichat should not only have overlooked this circumstance, which is evident to the meanest capacity, but advanced a doctrine quite the reverse. "A cold atmosphere," says he, "confines the functions of "the skin, and occasions those of the mucous system to be "proportionally extended. The internal secretions are "more abundant, &c." And again. "In warm seasons "and weather, on the contrary, the skin acts more powerfully, "and the secretions, particularly the urine, are diminished." *Anatomie Generale.* This is all right, had he excepted the biliary secretion, which follows a law diametrically opposite to this; viz. it is *increased* by a warm, and *diminished* by a cold atmosphere, in the same manner as perspiration.

I have likewise shewn that in the cold, hot, and sweating

* It is remarked, that the Creole children in Jamaica are subject to liver complaints. Since the 1st Edition of this Work appeared, the documents shewing how much the liver suffers in the West India Climate and diseases; excepting perhaps in the Concentrated or Yellow Fever, where the brain and stomach bear the onus of disorganization, have so multiplied, that nothing more may be said on that score. Hepatitis is frequent in Egypt, Coast of Guinea, and Sicily, where the heat is occasionally excessive.

stages of fever, the two processes are exactly simultaneous and proportionate. The *partial sweats* that break out towards the termination of the hot fit, are accompanied, as Dr. Fordyce remarks, with "*partial secretion*, and irradiations of heat arising from the præcordia." I shall now proceed to other examples illustrative of this sympathy. The Asiatic and African, though inured from their infancy to the high temperatures of their respective climates, guard, nevertheless, against *excessive* perspiration, and its too frequent consequence, *suppression*, by keeping the skin soft and unctuous, whereby they maintain an *equable* flow both of perspirable matter and bile. The *former* is evident to the senses; the *latter* is proved by the regularity of their bowels, and their general exemption from bilious or hepatic diseases. "The use of oil" says Dr. Currie, "instead of clogging the pores, keeps the skin moist; and while it guards against *excessive*, promotes moderate and *necessary* perspiration."—279. In our own climate, the gentle diapnoe, or insensible perspiration of *mild weather*, coincides with the regular biliary secretion; while it is in August, when the perspiration is most in excess, that we see cholera morbus, and greatly increased secretion of bile.

Bichat ascertained, by direct experiments, that during the time of digestion in the *stomach*, the pyloris is closed, and the biliary secretion *diminished*. We know that a corresponding heat, dryness, and constriction on the surface of the body, are observable at this period. On the other hand, he found that, whenever the chyme began to pass into the duodenum, the biliary secretion was rapidly augmented. We know that, at this very time, the surface relaxes, and the perspiration is increased. Every one knows the effects of emetics and nauseating medicines on the skin and perspiration: the same effects are produced on the biliary secretion. "In all cases," says Dr. Saunders, "where bile is secreted in *too large* a quantity, the use of emetics is improper; indeed, the actions of nausea and vomiting *increase* its secretion." p. 176. This sympathy is equally visible where the secretion is deficient.

If we observe those emaciated objects returning from the East and West Indies with indurated livers, sallow complexions, torpid bowels, and paucity of biliary secretion, we invariably find the skin dry, constricted, and harsh to the feel, without any thing like the softness and moisture of health.

In *diabetes*, where perspiration is notoriously defective, there is the most decisive evidence of diminution in the biliary secretion. "There are, perhaps, few cases of diabetes," says Dr. Watt, "without some affection of the abdomen, particularly in the epigastric region." p. 47. "Some morbid change," says the same accurate observer, "in the alvine excretion *always* accompanies the diabetic habit. *Costiveness* is perhaps the *most common* of these. In some instances the bowels have been so remarkably torpid, that even the most powerful medicines, in uncommonly large doses, produced but trifling effect." And, speaking of Stevenson's case, he says, "the quantity of alvine excretion was inconsiderable; it had also an *uncommonly white* appearance."—These facts speak for themselves.*

In chlorosis Dr. Hamilton observes that—"the perspiration seems to be checked"—and "I am persuaded," says Dr. Saunders, "that in chlorotic habits, the bile is more insipid—"*is secreted in less quantity*, and of a paler colour than in "health." p. 232. "In maniacal habits," continues the last-mentioned author, "there is generally a *defect* in the se-"cretion of bile." I need not say how marked is the dry, rigid skin, and deficient perspiration, in most maniacs. "Sea-sickness," says Dr. Saunders, "and a sea-voyage, contribute very much to "*restore the secretion of healthy bile*." The well-known effect of these in determining to the surface, and promoting perspiration, especially that gentle diapnoe, corresponding with healthy secretion in the liver, need not be insisted on. The torpid state of the skin in melancholia, hypochondriasis, and most nervous disorders, exactly coincides with that of the liver and bowels in the same. "Hypochondriacal complaints," says Dr. Saunders, "are always attended "with dyspepsia and diminished secretion, with great torpor "of the alimentary canal."—192. And again, "The symp-"toms of dyspepsia and diminished secretion, which are now "rendered more conspicuous among females, from their se-"dentary life, are most effectually removed by the means "suggested,"—viz. sea-sickness and a sea voyage, the very surest means of keeping up a regular and healthy discharge from the pores of the skin.

The same may be said of exercise, which powerfully promotes the secretion of bile as well as perspiration.

* Are not the kidnies irritated by the non-secreted bile, (or rather the elements of bile floating in the circulation) into inordinate action, in diabetes? Are not the effects of bleeding and mercury thus explained?

There is a curious case related in the Edinburgh Medical and surgical Journal, vol. 2, page 5, where an obstinate dyspepsia [where bile is known to be deficient] could not be cured till the exercise [broadsword] brought on a copious flow of perspiration. In cases of deranged structure and deficient secretion in the liver, Dr. Saunders recommends, what certainly will be found very useful—"the tepid bath, and small doses of mercury."

Here the bath must act first on the skin, and probably on the liver, from the sympathy in question—while, on the other hand, the mercury, which is known to increase the action in the liver, may produce its diaphoretic effect, from the same consent of parts above alluded to.

All the passions corroborate this doctrine. Fear, grief, and the other depressing passions, when moderate, lessen the secretion of bile—render the skin pale or sallow, and check the perspiration. On the other hand, anger and rage are well known to increase the biliary secretion; and their corresponding effects on the surface are visible to every eye. Joy, hope, and what may be termed the elating passions, when in moderation, determine to the surface, and keep up a salutary flow of bile and insensible perspiration, so congenial to the healthy functions of the body. I shall adduce no more examples, till I come to speak of dysentery and cholera, which will, I think, afford undeniable proofs of the sympathy in question.

In the mean time, this connexion between two important processes in the animal economy, while it fully accounts for the increase of action in the hepatic system, from the influence of a hot climate on the surface, will be found to elucidate many of the phenomena attending those diseases we are considering; and perhaps remove the stigma of *empiricism* so commonly attached to their cure.

It is allowed that perspiration and biliary secretion are increased by tropical heat, and that the latter is *vitiated*. Perhaps, even here the parallel holds between the two.—How different is the profuse and gross evacuation of sweat, from that insensible halitus, or gazeous fluid, which just keeps the skin soft and smooth in health!

We know that Nature has recourse to the perspiratory process to obviate *greater* evils that would accrue from accumulated heat:—we have every reason to believe, from analogy, that the increase of the biliary secretion is also a wise mean employed by the same invisible agent, to guard against congestion, and derangement in the hepatic system.

I have shewn, from Dr. Currie, that even "the *necessary* "quantity of perspiration in a hot climate enfeebles the sys- "tem." So the increased and vitiated secretion of bile debilitates and renders irritable the whole track of the alimentary canal. "The inhabitants of warm climates," says Dr. Saunders, "are extremely subject to diseases arising from the "increased secretion of bile, and the excess of its quantity in "the primæ viæ, which either, by regurgitation into the sto- "mach, produces a general languor of the body, together "with nausea, foul tongue, loss of appetite and indigestion, "or being directed to the intestines, excites a painful diarrhœa, "ultimately tending to weaken their tone, and disturb their "regular peristaltic motion."—*p.* 157.

As bile, especially when vitiated, is certainly apt to gripe and loosen the bowels, it might be supposed, that if it be increased with the cuticular discharge, those whose laborious exertions keep them every day bathed in sweat for hours, would be continually subject to diarrhœas. But Nature has admirably guarded against such an inconvenience by establishing what may be termed a *vicarious sympathy* between the skin and the internal surface of the intestines, by which the secretion of mucus, &c. on the latter is diminished, as the perspiration is increased. In temperate climates, therefore, and among the laborious classes of society, this increase of the biliary fluid is productive of little or no mischief, being all expended during the digestion of their food, which is generally composed of such materials as require strong organs and powerful fluids for that purpose.

> "————Their daily labour thaws
> To friendly chyle, the most rebellious mass
> That salt can harden, or the smoke of years."

But it is very different with Europeans in hot climates. There the vicarious sympathy is not always able to keep in check the diarrhœa; and when it *is*, the superabundant secretion of bile accumulates in the primæ viæ, producing all the symptoms above enumerated, till its quantity or quality raises a commotion in the bowels, in consequence of which it is expelled. Hence the impropriety of attempting athletic exercises in the heat of the day between the tropics, which must greatly increase the ill effects described.

These then are the penalties (aggravated, indeed, too often by our own misconduct) which are incurred, more or less, by emigration from a temperate to a torrid zone! They are the

mild inflictions, however, of Nature, wisely calculated, and providentially designed, to ward off more serious evils. They must be continued long before they induce actual and dangerous diseases; and I am convinced we might, in general, escape the latter, by exercising our rational faculties in observing and rendering subservient to our use, the simple, but salutary operations of Nature. After having been severely taught to feel the ills I am going to pourtray, it is still a most pleasing task to trace the wisdom and benevolence of our Creator in what might *seem* the imperfection of his works.

We now proceed to the more serious injuries too frequently resulting from these spontaneous, but salutary efforts of the constitution, when counteracted or goaded on by our own injudicious management, or by unavoidable accidents.

I have shewn, on the authority of Dr. Currie, that excessive perspiration occasions a loss of tone in the extreme vessels; in consequence of which, the perspiratory fluid continues to be poured out *after* the cause or necessity has ceased to operate. It is precisely the same with respect to biliary secretion. He has likewise observed that, in the last-mentioned state, the application of even a slight degree of *cold* is pregnant with danger. It certainly is so; and on more accounts than one. For not only is the animal heat too rapidly abstracted, but the extreme vessels on the surface, and likewise *those of the vena portarum*, are instantly struck torpid; the perspiration and biliary secretion are arrested; the passage of the blood through the liver is obstructed; and a temporary *congestion* throughout the portal circle is the result.

This view illustrates, and is at the same time confirmed by, the observations of two physicians in very different and distant parts of the world. Dr. M'Grigor remarks, that during the march of the army over the sandy desert of Thebes, where the thermometer frequently stood at 118 in the soldiers' tents, the health of the troops was equal to what it had been at *any* former period in India. "Heat of itself then," says he, "does not appear to be the *principal* cause of the prevailing diseases." It certainly is not; but when excessive and long continued, it induces that state of the vessels on the surface, and of the liver, which is easily thrown into disease by the sudden application of slight degrees of cold. This accounts for Dr. Moseley's paradox, that "*cold* is the cause of almost all the diseases in *hot* climates, to which climate alone is accessary." He refers the mischief here entirely to checked perspiration; but the connexion which I have traced between

this and *internal* mischief, will more amply elucidate this affair. Thus, in the months of April, May, and beginning of June, at Calcutta the heat is considerably greater than during the subsequent rainy months; but perspiration, though profuse enough, is steady and pretty uniform, and the only diseases are those from increased secretion of bile. From the middle of June, on the other hand, the close, humid, and sultry atmosphere, is attended with an absolute exudation from every pore of a European's body; in which state the chilling application of rain—the raw, nocturnal vapours—or the atmospherical vicissitudes of autumn, will produce, as may easily be conceived, the effects I have described above, the consequences of which will be fever, dysentery, or both.* It is on this account that the Bengalese are observed to be more assiduous in using oily frictions at this period than at any other. They know, from experience, that by such precautions they are enabled to maintain a more *uniform* discharge from the pores, to check profuse perspiration by day, and to obviate the effect of rain or cold by night.

On the Coromandel coast, however, where the range of temperature is higher and more permanent; where the duration of the rains is short; where the nights are either hot, as during the hot land-winds, or temperate, dry, and clear, as at other times, the deterioration of the hepatic organs is slow and gradual, *where temperance and regularity are observed.* But among heedless sailors, soldiers, and others, who, to the stimulating effects of the climate, add inebriety, too much food, or ill-timed exercise, then the biliary secretion and perspiration are so hurried and augmented, and the vessels so debilitated, that the smallest atmospherical vicissitude becomes dangerous.†

The effects resulting from the application of cold under these circumstances, will be in all degrees, from a slight shiver to a fever, or even instant death. We will suppose them only in a low degree. During the temporary torpor of the extreme vessels on the surface, and of the vena portarum, the pori biliarii and excretory ducts will partake of the same atony, and the bile will stagnate, till the re-action succeeds and propels it forward in its accustomed course, with a degree of acceleration proportioned to the previous quiescence. It

* Vide Section on Bilious Fever.

† See the Section on climate of Egypt in the Mediterranean division of this Work, where the foregoing reasoning is still farther elucidated, and confirmed.

is plain, that by frequent repetitions of this, the vessels and ducts in question will lose tone; and as atony is the parent of spasm, constrictions of the ducts must at these times take place; the bile will become viscid, occasionally, from stagnation, and be with more difficulty brought forward into the intestines during the subsequent increased action of the vessels. Thus obstructions will form, and an inflammatory congestion be constantly impending, till time, or some accidental aggravation of the causes above-mentioned, kindles up HEPATITIS, which will run rapidly into suppuration, and perhaps in a few days destroy both the organ and the life of the patient, unless it be skilfully checked in its career.

If, during this catastrophe, we expect to find the pathognomonic symptoms of acute Hepatitis, as it appears or is described in Europe, we will be greatly deceived. In *comparatively* few instances have I seen the violent rigors, high fever, hard, quick, and full pulse, acute pain, &c. which we would naturally look for as preceding the destruction of such a large and important viscus.

Such cases, however, pretty frequently occur, during the first twelve or eighteen months after arriving in the country. A young gentleman of great abilities, and a good constitution, but who despised all curbing rules of temperance or precaution ran about in the sun for some days at Malacca, indulging in all sorts of licentiousness and inebriety; and was seized in a day or two afterwards, on our passage to China, with rigors and heat alternating; succeeded in a few hours by pain in the right side, extending across the pit of the stomach, accompanied with some difficulty in respiration. He did not send for me till twelve or fourteen hours after the attack. He had then high fever—hard, quick pulse—great dyspnœa—a short cough, and the most excruciating pain in the region of the liver. Although I had then been accustomed to treat Hepatitis as it more usually appears in India, aud this gentleman had been a voyage to Bengal in a Company's ship before he joined us, yet the disease had so decided a European character, that I determined on employing the European method of cure. Accordingly, blood was drawn "*pleno rivo*," from his arm, and repeated twice the next day. His bowels were kept open with saline cathartics; and antimonials, in nauseating doses, were prescribed, to relax the surface, which was dry and burning. By these means the febrile symptoms were greatly mitigated, and blisters to the side seemed to relieve the local affection. He still, however, had great tenderness on pressing the right

hypochondre; and on the fourth day he complained of having a flux.

I knew but too well how sure an index this was of mischief going on in the liver. I therefore commenced the administration of mercury without delay. But while endeavouring to saturate the system with this medicine, we were overtaken by a most violent typhoon, or hurricane, in the Chinese seas, which kept the ship in the greatest agitation, and completely drenched with water, for many days together. I had reason to believe, that he neglected at this time to take his medicines, and I was not able to pay minute attention to him myself. The flux was now the prominent symptom, and, though I used every exertion, I could never afterwards affect his mouth with mercury.

A fulness soon appeared in the right side; while the shiverings, cold sweats, and lastly, the colliquative diarrhœa, that terminated the scene, left no doubt that abscess had not only formed, but burst internally. He dragged out a miserable existence of more than three weeks from the commencement, and died at the island of Lintin, where I inspected the body.

Before his dissolution, the discharge *per anum* was purulent, and dreadfully fœtid. A few hours before his death he vomited a similar matter, and then sunk rapidly, retaining the possession of his mental faculties till the last moment; and regretting his inattention to the advice I had often given him, previous to his illness, warning him against the effects of intemperance and exposure to the heat of the sun.

On dissection, the liver was found one entire mass of suppurations and disease. I passed my hand from it into the stomach, to which it adhered, and through which an abscess had burst. Another adhesion had formed between the liver and the transverse arch of the colon, through which was an exit also for the matter. In short, scarce a trace of healthy organization was to be observed at any distance from the convex surface of this organ, which part alone preserved any thing like a natural appearance.

I met with few cases in India so exquisitely marked with acute European symptoms as this. But in all those which exibited traits at all approximating to the above, I delayed not a moment in commencing the mercurial treatment, *in conjunction*, with the antiphlogistic; the *latter* being carried no farther than the inflammatory symptoms appeared to require; the *former* continued uninterruptedly till the full effect was produced, and till every shadow of danger was gone.

Such instances as these cannot be mistaken; they can too often be traced to evident and adequate causes; such as intemperance—violent exercise in the sun—or sudden exposure to cold when the body has been some time in a state of perspiration. They will occur principally among those lately from Europe, or at least within a year or two after their arrival; and such symptoms will be, in most cases, confined to the young, the robust, and plethoric habits.

But in general, the disease makes its approach in a much more questionable shape, though equally pregnant with danger as the foregoing, and not seldom more rapid in its course. A man comes to us, complaining of having a flux. He says he is frequently going to stool—that he is griped; but passes nothing but slime—that his stools are like water, or some such remark. It is ten to one if he mentions any other symptom at this time. But if we come to interrogate him more closely, he will confess that he has had some soreness at the *pit of the stomach*, or perhaps in the right side. If we examine the part, a fullness will some times appear—if we press upon it, he starts back, or shrinks at least from the pressure.

If we look into his countenance, besides a certain anxiety we will observe a dark kind of sallowness in his cheeks, and a yellowish hue in his eyes. The latter is seldom absent in hepatic diseases, both in India and Europe.

The temperature of the surface will probably not be much increased; but the skin will have a dry feel—his mouth will be clammy, and his tongue have a whitish or yellow fur towards the back part. His pulse, though neither hard nor very quick, will have an irritable throb, indicative of some internal affection. His urine, if inspected, which it always should, will be found to tinge the bottom and sides of the pôt with a pink sediment, or turn very turbid a few hours after it is voided; and he will generally complain of some heat and scalding in making water.

These are all the external marks we can perceive; and the few symptoms at the head of the list are all that the heedless soldier or sailor has noticed, or at least recorded. Happily for the patient, as well as his physician, the degree of violence in the bowel complaint, where other symptoms are not conspicuous, will be almost always a sure index to the rapidity or danger of that in the liver. Whereas in those cases where the symptoms are of the violent or European cast—particularly pain, fever, and dyspnœa, the bowels are very frequently costive for the first few days of the complaint.

If it is not early checked, it will frequently run on to suppuration, like the case described, and then the chance of its pointing, or of the matter finding its way through ducts or adhesions, with ultimate recovery, is faint indeed. Other symptoms will occasionally arise in this disease, or accompany it from the beginning. Thus, the fever is sometimes smart; the enlargement, hardness, or tenderness of the part, more violent; the inability of lying on a particular side may be complained of; a short cough may attend; or that particular sensation in the acromion scapulæ may be noticed, though it is not very often that this last is present.

These symptoms, and the duration of the complaint, will vary much. Indeed, the latter is very uncertain; as its continuance may be protracted to several weeks, without suppuration or organic derangement of vital importance following.

This, then, is the hepatitis of India; and certainly there is no small dissimilarity in symptoms, between it and the acute hepatitis of Europe. The flux, which may be termed the pathognomonic of the former, is almost always wanting in the latter. The one (Indian) partakes more of inflammatory congestion and obstruction; the other of active inflammation, like that of the lungs, kidnies, &c.

Such are the marks that are to guide the practitioner when the disease is present. An attention to the following premonitory symptoms, described for the use of the more intelligent class of patients, into whose hands this essay may fall, will probably save them many a nauseous dose, and many a tedious day's illness.

In all bilious diseases, the *mind* is much affected. When hepatitis is impending, it loses a portion of its wonted firmness. Our spirits are unequal; we are occasionally gloomy and irritable; and apt to see things through a distorting medium. This too frequently drives patients to have recourse to those very means which hasten on the fatal catastrophe, but which give a temporary relief to disagreeable mental sensations, that are only symptomatic of the corporeal affection —I mean, an indulgence in the fugitive pleasures of the bottle.

The eye and countenance assume the appearance alluded to before, termed Bombycinous by Dr. Darwin; and the urine becomes high-coloured, or tinged with bile; and almost invariably produces considerable scalding in its passage through the urethra. Dyspeptic symptoms arise, and generally mislead the patient into a belief that his complaint is

only indigestion. After any thing like a full meal, we feel a most uneasy load and sense of oppression about the pit of the stomach, which are relieved by yawning, stretching, or standing up, and aggravated by stooping, or the recumbent posture. The digestion is never equal to the appetite, though the latter is often deficient;—and this leads to irregularity in the bowels. One day, there are dark, clayey stools, with costiveness; another, they are fœtid and slimy, with flatulence and looseness. The skin has not the moist, soft feel of health; but often a dryness, with partial clammy perspirations, and irregular flushes and chills.

We may not feel, at this time, any pain on pressing the region of the liver; but a short and unexpected step on uneven ground, will frequently cause a most unpleasant sensation at the pit of the stomach, or in the right side, as if something dragged there. Indeed, if the patient be attentive to his own feelings, some internal uneasiness will always be found to precede the pain on external pressure; at least I invariably found it so in my own person, and it has more than once admonished me of my danger.—The same remark has been made to me by intelligent patients. Disturbed sleep, and frightful dreams, precede and accompany this disease, in almost every case. Nothing harassed me more than this unpleasant symptom; and on *inquiry*, I always found my patients make the same remark; but they will seldom mention this, unless they are interrogated.

When all, or several of these symptoms, make their appearance, a few doses of calomel and cathartic extract, administered so as to keep up a regular increase of the alvine evacuations for some days, together with the strictest abstinence and caution in avoiding the extremes of heat, or sudden vicissitudes, will often anticipate the attack of this insidious disease, and entirely check it in embryo. If these means, however, do not remove the morbid train of premonitory sensations above described, mercury should be slowly introduced, so as to produce a brassy taste in the mouth, and kept at this point till the return of health, and strength, which would hardly ever fail to result.

It will be readily understood, that the warning symptoms above-mentioned, can only be expected where the disease is coming on gradually, from effects of climate, and the more moderate application of such causes as hasten these effects. Where the *excitantia* are strong and evident, such as great intemperance; sudden exposure to considerable atmospherical

vicissitudes, particularly to cold after perspiration; violent exercise, &c. then the interval between them and actual disease, will not always afford many admonitory sensations, or permit us to put in force the very desirable precept of the poet—

"Principiis obsta:—venienti occurrite morbo."

TREATMENT.

The medical practice of India is more simple than that of Europe, evidently from the great connexion which experience has traced between many *apparently* dissimilar diseases in the former country; rendering it only necessary to vary, in some degree, the same methodus medendi.

During the first twelve months after arriving in the country; whenever the patient was at all robust, the pyrexia evident, or the pain considerable, I bled at the very *commencement*, and not with a sparing hand. I did so with a two-fold view. One was to relieve the febrile symptoms, by lessening the inflammatory congestion in the liver and portal circle; the other, to lower the tone of the constitution, which, experience taught me, accelerated the effect of that medicine on which my principal reliance was placed. To further both these objects, one or two doses of calomel, or the pil. hydrarg. with opium and antimonial powder, were given, and followed by castor oil or jalap, which never failed to bring down a copious alvine discharge, consisting of any thing but natural fœces, or healthy bile. For in the flux attending hepatitis, the violent straining and griping are succeeded by nothing but mucus and blood, accompanied by a distressing tenesmus, *unless* when laxatives are taken, and *then* diseased secretions only, with occasionally a hardened scybala, or other fœcal accumulation, are passed.

It appears, by Mr. Curtis, that the hospital practice at Madras in his time, [thirty-five years ago] was to give three grains of calomel, with some rhubarb and soap, night and morning, till ptyalism came on; and if it was necessary to have the mouth sooner affected, a drachm of mercurial ointment was rubbed in on the affected side every night. No opium was then thought of; but the hypothetical prejudice against that valuable article is now, I believe, pretty well

worn off; and I know, from pretty ample experience, that, in conjunction with antimonial powder, it forms a most admirable auxiliary to the mercury; not only soothing many uneasy sensations of the patient, but determining to the surface, and promoting a diaphoresis, which is of infinite service in this, as in most other diseases.

In all *urgent* cases, I seldom gave less than twenty-four grains of calomel in the twenty-four hours; and generally in the following manner:—

R. Submur. Hydrarg. gr. vj.
Pulv. Antimon. gr. iij;
Opii, gr. ſs.
M. ft. bolus—sexta quaque hora sumendus.

During the exhibition of these medicines, an occasional dose of castor oil, or other laxative, and emollient injections, contributed to mitigate the griping and tenesmus; while blisters and leeches often relieved the local pain of the side. But these were only secondary considerations; and the grand object was to get the mouth affected, when the flux and other symptoms were sure to give way.

The secretion of healthy bile—the flow of saliva from the mouth—and a gentle and uniform perspiration on the skin, were synchronous effects of the medicine, and certain indications of the approaching cure. But it was necessary to keep up these by smaller doses of the medicines alluded to, not only till every symptom of the disease had vanished, but till the clear countenance, keen appetite, and regularity of bowels had returned, and health and *strength* were completely restored.

Indeed, a degree of obesity generally succeeds the administration of the medicine, and the cure of the disease; nor need we wonder at this, when we consider the previously deranged state of the digestive organs, to which a renewed energy is now communicated.

But, in effecting these salutary objects, I have often been obliged to push the mercurial treatment in a much bolder manner than above described. I have myself taken calomel in twenty grain doses, three times a day, without experiencing the slightest inconvenience from the quantity; nay, I always found large doses sit easier on the stomach, and occasion less irritation in the bowels than small ones. At this time, too, I was using every exertion, by inunction, to forward the ptyalism; yet it was several days before I could produce any effect of this kind. These doses may astonish those who do not

know the difficulty of affecting the mouth with mercury in a hot climate, when the liver is verging to suppuration. The idea of their purging and griping at these times is truly chimerical. Indeed, I never saw any of those terrible cases of hypercatharsis which people so much talk of, except where cold was applied, and perspiration checked during salivation, when certainly, as may naturally be supposed, a severe bowel complaint is the consequence.* But in that dangerous state of the liver which I have mentioned, when a few hours, perhaps, must determine, whether healthy secretion or destructive suppuration is to result, a tardy, irresolute practice, is pregnant with mischief. Unfortunately, at this critical period, such is the torpor throughout the lacteal and lymphatic vessels of the abdomen, that the largest doses internally, and the most assiduous inunctions externally, will sometimes fail in introducing a sufficient quantity of mercury to saturate the system. In the mild climate of Prince of Wales's Island, where the temperature of the air might be supposed to favour absorption, I have had a couple of Malays daily employed, for hours at a time, in unsuccessful frictions, the lymphatic vessels refusing to take up the ointment in any considerable quantity. At the commencement of this disease, and of dysentery, I have often been able to form a tolerably accurate prognosis of the difficulty that would be experienced in raising pytalism, by observing the aptitude of the absorbents on the surface, while a drachm or two of mercurial ointment were rubbed in on the thigh or arm, under my own inspection. This hint may be worth attending to. Here the tepid bath, by determining to the surface, will sometimes so far restore the balance of excitability and circulation as to promote the absorption of the mercury, both from the external and internal surfaces of the body. But great care is to be taken to avoid a subsequent chill, and a consequent recoil of the circulation, which will be sure to aggravate all the symptoms instead of relieving them.—The Nitro-muriatic Acid is also to be used in these cases. The absorption of mercury into the system is also accelerated by causing the patient to swallow a considerable quantity of warm diluting drink, as thin water-gruel, every night at bed-time.

* "Granis viginti perfrequenter usus sum, duis autem, quotidiano, adhibitis aliquid incomodi, aut periculi, tali ab exhibitione pervenire nunquam observavi."—*Thesis on Hepatitis, by* T. B. Wilson, M.D. Surgeon, R.N. 1817.

It might be expected that I should here point out the predisposing and exciting causes of Hepatitis; but these have been in a great measure anticipated by the preceding remarks. I observed, that the application of cold to the body, during and subsequent to perspiration, was by far the most frequent manner in which the disease was contracted; but the European, and the casual visitor, may well wonder how cold can be often applied on the burning coast of Coromadel, where the temperature is high and steady by day—where the nights are, for months together, hot—and seldom raw or damp, as at Bombay or Bengal. A nearer inspection dispels the difficulty, and shews us that nothing is more common than such an occurrence. The European soldier or sailor, exhausted by exercise in the heat of the day, and by profuse perspiration, strips himself the moment his duty is over, and throws himself down opposite a window or port, to inhale the refreshing sea-breeze; his shirt, in all probability, dripping with sweat. The effect of this present gratification is well exemplified every day before his eyes, by the Officers of his ship or Regiment, who, when *hobdaars* and salt-petre are not at hand, refrigerate their wine or water, by suspending the bottles in wetted cloths (generally worsted or woollen) and exposed to a current of air, when the evaporation, in a few minutes, renders the contained fluid quite cold.

It requires more philosophy or self-command than generally falls to the lot of the aforesaid classes, to resist the grateful refreshment which this dangerous indulgence affords. The dreadful sensations arising from heat and thirst imperiously demand fresh air and cold drink, which few have stoicism enough to forego, even where the bad consequences are previously known. I shall have occasion, hereafter, to relate some fatal instances of this kind, which happened under my own eye. The night, which nature designed as one of the grand restoratives of our energy, is the time when many imprudent exposures, of the species described, are made among sailors and soldiers; particularly the former, on account of the close and sultry apartments in which they sleep, whereby they are forced to make frequent nocturnal visits to the open air, while they are streaming with perspiration.

It is asserted by almost all writers on tropical climates, that atmospherical vicisitudes are comparatively trifling in

those regions, and that the thermometrical range is seldom of greater extent, than from five to ten degrees daily, and fifteen or sixteen degrees annually. "In countries between the tropics," says Dr. Moseley, "the heat is nearly uniform, and seldom has been known to vary through the *year*, on any given spot, either by *day or night*, 16 degrees."—p. 2. This is not correct: the thermometer, at Bombay and Calcutta, in the month of January, is frequently as low as 55° in the night: and in the month of April up to 90°, or even higher, in the day; making an annual vicissitude of thirty-five degrees. And, notwithstanding Dr. Moseley's assertion to the contrary, a transition of eighty degrees, *in one day*, has been witnessed between the tropics. Sir James M'Gregor, in his Report to the Medical Board at Bombay, for the month of November, 1800, observes, that "the mercury had an extraordinary wide range, from 68°—50° to 130° in the open air."—*Edin. Med. and Surg. Jour. July* 1805, *p.* 271. And he shortly afterwards adds—"More cases of *Hepatitis* appeared than in either of the two former months."—ib. But even on the Coromandel coast, the *actual* vicissitude to which the human frame is often exposed, far exceeds what is generally believed. Let a thermometer be suspended in the open air at Madras, and it will point for many hours in the day to 120° or 130°, but in the night it will fall to 80° or 82°. Here, then, is a range of 40 or 50 degrees in the day, to which hundreds of European soldiers and sailors are unequivocally exposed; for, let it be remembered, that they are kept neither in glass cases, nor the cuddies of Indiamen, though the above consideration ought to intercede powerfully in their behalf, and induce their officers never to subject them to such dangerous vicissitudes in a climate of that kind, unless from inevitable necessity.

But this subject will meet with a very full consideration in the prophylactic part of this essay, where I hope to offer some important remarks on certain means of preserving health in hot climates, connected with the above topic, which have been hitherto passed over unnoticed or misunderstood by medical authors.

I need hardly remark, that intemperance in spirituous liquors strongly predisposes to and excites Hepatitis. But it is not generally known, or suspected, that the depressing passions, particularly grief, have the same effect. I have seen many instances, however, where no doubt could be entertained on the subject. I shall only relate one. In the

month of December 1803, while H. M. S. Centurion was lying at anchor in Mocha Roads, two men, when in the act of loading a gun, had their arms blown away, and were otherwise dreadfully shattered, by the gun going off, in consequence of the neglect of a boatswain's mate, who was captain of the gun. One of the men died, and the circumstance produced such a degree of remorse and grief in the mind of the careless boatswain's mate, that he was instantly seized with Hepatitis [though in the prime of life and health] and in a few days followed his unfortunate shipmate to the grave!——The close sympathy which subsists between the *brain and liver* is well known, and strongly illustrated in hot countries, where the latter organ (like the lungs in Europe) being pre-disposed to disease from the general effects of climate, suffers readily and obviously, in consequence of the sympathy in question.

I shall now make a few observations on those chronic derangements in the liver and its functions, which, in hot climates, succeed violent or repeated attacks, such as I have already described. These derangements, however, (especially of function), are but too often the consequence of long residence between the tropics, independent of any serious or acute inflammation in this organ. Where induration, enlargement, or any particular structural alteration has taken place, the external accompaniments are evident to the most superficial glance.

Sallow countenance——emaciation——irregular bowels——high-coloured urine——scalding in its discharge——low spirits——often a chronic flux, with pain, fulness, or hardness in the region of the liver——evening fever——dry cough, and swellings of the ancles, are the prominent features of this deplorable malady. A degree of induration and enlargement continued nearly three months after a severe attack of Hepatitis which I experienced in my own person; and a distressing bowel complaint succeeded, and harrassed me for more than a year.

A return to Europe brought me no relief; on the contrary, by getting cold in my feet, while sitting in a dissecting room in London, a few weeks after my arrival, a violent Hepatitis was induced, accompanied by the usual dysenteric symptoms. The flux that preceded, for so many months, this last relapse, may serve as a specimen of those connected with chronic hepatic obstruction.

Once, perhaps, in the twenty-four hours, generally in the

morning, there would be an ill-conditioned fœcal evacuation, accompanied with mucus, slime, and apparently vitiated bile. After this, I would have two, three, and sometimes four hours' respite. An uneasy sensation would then arise in my bowels, with rumbling and flatulence, which would proceed along the whole track of the intestines, when I was forced suddenly to stool, nothing, however, coming away, but some slimy mucus, streaked occasionally with blood, or greenish, bilious sordes. This discharge was always attended with more or less griping, straining, and some slight degree of tenesmus; after which another interval of ease, two or three hours in duration, would take place, and then the same symptoms as before described, continuing with great punctuality, for weeks and months together. During this period, my appetite was tolerably good, but my spirits exceedingly irregular —generally depressed. The least excess in eating or drinking—the exposure to night air—or the slightest application of cold to my feet, aggravated my complaint. The cheering prospect of returning to my native home, and the hopes that climate alone would effect a cure, together with the want of accommodation for undergoing a course of medicine on a voyage, where I was only a passenger, induced me, most unwisely, to delay the only effectual means of curbing the disease; till a nearly fatal relapse forced me to have recourse to that medicine which more than once before preserved my life. The flux, which all this time was symtomatic of liver obstruction and irregular secretion, was completely removed with the original cause.

Two circumstances appear to be almost always attendant on these chronic diseases of the liver—diminished secretion of bile, and low spirits. The former we may account for in two ways: either as resulting from that atony which takes place in an organ that has been long stimulated into inordinate, or at least irregular action, by hot climates, &c. or from structural derangement, generally induration, which but too often accompanies the preceding state It is likewise certain, that the bile is vitiated in quality, as well as deficient in quantity. And the numerous complaints which we hear from people, with evidently torpid livers, of *excessive secretion*, which they conclude must be the case, from the nausea, vomiting of green bile, sick head-aches, yellowness of the eyes, gripes, &c. with which they are occasionally harassed, arise from irregular, but on the whole, diminished and disordered biliary secretion.

I do not think the ingenious Dr. Watt has been very happy in his pathological elucidation of bilious diseases.—"The liver," says he, "receiving its stimulus from venous blood, has more to do than in health; hence the origin of bilious complaints, which, with low spirits, and prostration of strength, generally mark the first stage of disease."—p. 207.

The liver may have *more to do* in bilious diseases than in health; but I am well convinced *it does less*. The torpor in that organ keeps a general plethora throughout the abdominal system of black blood; consequently, when it happens to be occasionally excited into unusual action, a greater flow of vitiated biliary secretion ensues, from this very cause; when, unless, proper means are employed, the viscus falls back again into its previous state of inactivity. This view of the subject elucidates the effects of venesection, purgatives, and all the best remedial processes.

The torpid state of the bowels, dependent on that of the liver, admits of morbid bilious accumulations (after those periods of excitement) which lurk about the duodenum, or regurgitate into the stomach, by inverted peristaltic motion, producing all the phenomena alluded to. But, in a great proportion of patients, the torpidity of the alimentary canal is seldom roused by the acrimony of the bile; costiveness and low spirits going hand in hand, with the most obstinate uniformity.

The increase and amelioration of the biliary secretion, then, must always be kept in view, when treating this chronic obstructed, or torpid state of the liver.

The connection which I have traced between the biliary and perspiratory processes, will elucidate the operation of those means of relief, which experience has determined; it will also suggest the use of some others. Among the remedies for this complaint, mercury, given in small doses, and slowly, so as to keep up a brassy taste in the mouth for some time, holds a distinguished rank; as it effectually promotes the secretion of bile, and excites the extreme vessels on the surface.

To increase the latter effect, however, it has been found useful to combine with it a small proportion of opium and antimonial powder, both to guard the bowels from irritation, and determine to the skin. It is quite evident, and ought ever to be kept in mind, that no *violent means* should ever be used in stimulating an organ to action, whose torpor or derangement has proceeded from this very cause. The state

of the liver here may be compared to that of the stomach in a worn-out drunkard. It requires stimulants; but they must be nicely managed, else they will be productive of mischief instead of utility.

The next most salutary remedial process, is to keep up a regular peristaltic motion in the bowels, and excite the mouths of the excretory ducts of the liver, which will tend to eliminate the viscid and depraved secretions from that organ itself. I have found no medicine better adapted to this purpose than the following:

R. Ex. Colocynth. Comp. drachmam.
Subm. Hydrarg. gr. xx.
Antim. Tartarisat. gr. iv.
Ol. Carui, gt. viii.
M. Fiant pilulæ No. xxx.

Vel.

Ex. Aloes spicat. scrupulum.
Pulv. Antimonialis. gr. x.
Pil. Hydrargyri. scrupulos duos.
Ol. Carui, gt. vj.
M. Fiant pilulæ No. xx.

One or two of these pills, taken occasionally at bed-time, will move the bowels, gently next morning; carry off diseased, and promote healthy secretions of bile; and will be found to obviate, in a wonderful manner, that mental despondency, and long train of nervous symptoms, so constantly attendant on this complaint.

Our attention is next to be directed to the cuticular discharge. This is never to be forced by heating or stimulating, but an insensible halitus promoted, by the most gentle means. Moderate exercise, particularly gestation, as determining to the surface without fatigue, is highly useful. A sea voyage, combining these advantages with a more equable temperature, and keeping up a slight nausea, as it were, by which the cutaneo-hepatic secretions are increased, will be found beneficial where it can be commanded. The swing, an easy, and perhaps no bad substitute for gestation, or a sea voyage, I found very useful in my own case. I was led to try it for amusement only, and to dispel the ennui of protracted convalescence. It certainly has considerable effect on the skin—powerfully determines to the surface—and relieves those internal congestions so connected with, and dependent on, torpor or obstruction in the liver. The assiduous and daily application of the flesh-brush over the hypochondriac region,

will be found to excite the healthy action of the biliary organ in no mean degree. Blisters, or the more permanent drain of a seton in the side, where there is much local uneasiness, will likewise be had recourse to with advantage.

Flannels are essentially necessary, more particularly in the variable climate of this country, with the minutest attention to the warmth and dryness of the feet, especially where the bowels are tender. In torpid livers, where costiveness is a common symptom, flannels, by increasing the cuticular discharge, appear at first to constipate. But here, as in the costiveness arising from a sea voyage, no ill effects whatever are induced; on the contrary, the digestion improves, evidently from the biliary secretion being augmented in both cases.

On the other hand, where hepatic obstructions exist, with determination to the bowels, keeping them in an irritable state, as in my own case, the utility of flannels becomes both real and apparent.

In addition to the general use of flannel, the local application of a bandage of the same round the waist, in imitation of the Indian *cummerband*, is in these cases peculiarly advantageous. The native soldiery in India often contract bowel complaints from incautiously throwing off the *cummerband*, when heated on a march. I could state numerous instances, where the worst consequences resulted from negligence in this respect.

The tepid bath, using the utmost caution in avoiding a subsequent chill, will evidently be serviceable, on the same principle; as well as the warm mineral waters taken internally, as recommended by Dr. Saunders. The night air and late hours, are to be most religiously avoided; and a rigid temperance, amounting to abstinence, enjoined. In short, he who labours under obstructed liver, and hopes to protract his existence with any kind of comfort to himself, must abandon what are called the "pleasures of the table;" but which are, in reality, the bane of human health. Quantity is doubtless of more consequence than quality; yet raw vegetables and pastry, from their increasing acidity and rancidity in the stomach, are very generally detrimental. Tender animal food, in small quantities, with well-baked bread, or ship-biscuit, forms perhaps the most easily digested aliment in such cases. In India, and I believe in Europe, rice and curry will be found a salutary dish. The stimulus of the spice is very different from that of spirits or wine; and the rice is, without exception, the most unirritating, nutritious, and easily digested vegetable, which the bountiful bosom of the earth produces.

With respect to drink, although I certainly would recommend to my patient the laconic Greek prescription in the pump-room at Bath; yet I fear that most of those returning from the East and West Indies, afflicted with hepatic complaints, while they readily allow that "water is best,"—nevertheless, unanimously agree, that wine is most palatable. If the latter cannot be dispensed with, the acid and astringent kinds, at least, are to be rejected. Malt liquor will seldom agree, and spirits ought to be restricted as much as possible. I know well, that a dilute mixture of brandy and water has an indescribably soothing effect on the stomach and bowels, in these cases, and *seems* both to agree best, and prove most useful; but I am fully convinced it ultimately injures the tone of these organs, and increases the mischief in the liver, unless it be taken in the most guarded manner. Water upon the whole is best.

All the preceding remarks pre-suppose that a change of climate has been effected;—for such is the state of the biliary organ, after repeated attacks of Hepatitis, or a long residence between the tropics, that the most active of the above-mentioned remedial means will give but temporary relief, while the original cause continues to be applied.

I shall elucidate this more fully hereafter, when treating on dysentery. And yet the removal from a tropical to a European climate, requires caution. Nature abhors extremes and sudden vicissitudes. It certainly is dangerous to return to this country in winter, as I myself experienced. I landed in January, and before the end of February, I had a complete relapse of Hepatitis, and its accompaniment, flux.

Those who cannot undertake the long and expensive voyage to Europe, should endeavour to change a continental for an insular situation in India. Pulo Penang, or Prince of Wales' Island, though within six degrees of the equator, enjoys a milder air, and a lower range of temperature, than any of the presidencies. Here are neither the great vicissitudes of Bombay, the marsh effluvia of Bengal, nor the scorching heat of Madras. The climate is very salubrious. On the mountain, which occupies a great part of the island, and is of considerable elevation, bungalows are erected, open to the sea and land breezes, where the thermometer ranges between 70 and 80 degrees, and where the heat is never reflected or oppressive. From this mountain, too, the most romantic, extensive, and picturesque views, are presented to the delighted eye, contributing greatly to mental amusement and corporeal renovation.

A temporary residence on that beautiful island, during a painful illness and tedious convalescence, has produced in my mind a strong local attachment towards it, and a vivid recollection of its enchanting scenery.—

Illa terrarum mihi præter omnes
Insula ridet, ubi non Hymetto
Mella decedunt, viridique certat
Bacca venafro;
Ver ubi longum, tepidasque præbet
Jupiter brumas; et amicus Aulon
"Gracili palmæ,"* minimum falernis
Invidet Uvis.

The Malayan peninsula, from its being a narrow slip of land, washed on both sides, and nearly encompassed by the ocean—constantly covered with verdure, and open to the sea breezes, is blessed with a milder and cooler air than any continental part of India between the tropics, and bordering on the coast.

Columbo, in the Island of Ceylon, has also many local advantages, that render it extremely salubrious to Europeans, and consequently a convenient and easy retreat from the opposite burning coast.

The Cape of Good Hope, however well adapted to the refreshment of a crew, after a long voyage, by its abundant supplies of animal and vegetable food, is by no means calculated, in regard to climate, for the recovery of hepatic or dysenteric individuals, returning from the East. The daily atmospherical vicissitudes, at this celebrated promontory, are very great indeed, [25 or 30 degrees] and consequently injurious where the bowels are at all affected. I shall only mention one instance corroborative of this assertion.

His Majesty's ship Albion, on her late return from India, having touched at the Cape, sent a number of her people to the hospital, afflicted with chronic bowel and liver complaints. By the time of her departure for England, however, several of these had died, and all the others returned in a worse state than when they went on shore. This fact is worth attending to; and deserves to be kept in mind by the valetudinarian.

The climate of St. Helena approximates more to that of Europe, than the climate of any other intertropical situation. A rock, only twenty-seven miles in circumference, surrounded by an immense equatorial ocean, above the level of which it

* The palma coccifera, or coco-nut tree, whose milk is equally delicious and salutary, flourishes here in the greatest perfection, and may vie with the falernian juice in every good quality, without any intoxicating effect.

projects 3000 feet; whose summit is covered with perpetual verdure, and cooled by perennial breezes, must enjoy a serenity of air, and evenness of temperature, far beyond any part either of the Indies or Europe. The medium height of the thermometer is 64°, and atmospherical vicissitudes by no means great or sudden. At Plantation-House, the mercury does not rise higher than 72° in summer, nor fall lower than 55° in winter. A temporary stay at this island would probably be attended with a salutary seasoning, preparatory to exposing the debilitated frame to the rude inclemencies and transitions of northern regions. The scenery, too, of the *interior*, is as beautifully romantic, as that of the *exterior* is stupendously dreary and barren. The society, however, is confined; and forms a striking contrast with the social ease and unbounded hospitality of the East. But alas! it is a melancholy truth, that in the complaint I have been describing, a surprising mental despondency, or propensity to brood over misfortunes, pursues us through every climate!—

> Scandit æratas vitiosa naves
> Cura!—Quid terras alio calentes
> Sole mutamus?—*Atrabiliosus*
> Se raro fugit!

Sympathetic connexion between the mental and hepatic Functions.

The manner in which this mental depression becomes connected with derangement in the hepatic function, is a subject of curious inquiry. It is not a little singular, that two of the most important organs in the human body—the lungs and the liver, when in a disordered state, should exhibit a striking contrast in their effects on the mind. Thus, even in the last stage of phthisis—

> "Hope springs eternal in the *hectic* breast;"

and the final catastrophe stands a long time revealed to every eye but that of the patient.

In hepatic diseases, on the other hand, like Shakespeare's cowards, we "die many times before our death." It is a curious fact, that syphilis, a disease which can only be

cured by that medicine, on which we place our principal dependence in Hepatitis, is likewise attended with a similar despondency, but in a much less degree. There certainly is a greater connexion, or reciprocal influence, between the mental and hepatic functions, than is generally known or suspected. Experience has shewn, that both *excess* and *deficiency* in the biliary secretion affect the mental functions, though in a somewhat different manner. The former seems to exert its influence in two ways, viz, by its irritation in the primæ viæ, and by its absorption into the circulating system. That vitiated bile irritates the stomach and bowels, is admitted by all; and that part of it is occasionally absorbed, or regurgitates into the circulation, is equally evident, from the appearance of the eyes and countenance. The mental effects in both these cases are characterized by irritability, and what is properly called a choleric disposition; often, however, accompanied by the deepest dejection of spirits, amounting almost to despair, where no other adequate cause exists.

On the other hand, the defective secretion of bile seems to operate on body and mind in three ways, viz. By the insipid quality of the bile—by its absorption—and, simply, by its paucity: the mental effects characterized in such cases by melancholy or despondency. The insipidity of the bile in those diseases where the secretion is lessened, as in hypochondriasis, chlorosis, &c. has been noticed by Dr. Saunders and others. The consequence of this will be a torpor throughout the system at large, hence costiveness, imperfect digestion, chylification, sanguification, &c. ensue; the influence of which on the mind is obvious.

The bile, however, is not always insipid in quality, where it is deficient in quantity. In those cases where it proceeds from structural alteration of the liver, or succeeds violent diseases of that organ, the bile is occasionally as vitiated and acrid, as where excessive secretion is going on. This takes place especially when those causes are applied which formerly produced great excitement in the extreme vessels of the vena portarum; as, high temperature—exercise in the sun—debauches—violent gusts of passion, &c.

In hot climates, indeed, I have thought that an inflammatory state of the liver was sometimes induced, or at least increased, by the acrimony of its own secretions. It has frequently been remarked by others, and felt by myself, that after brisk doses of calomel and cathartic extract, the bilious evacuations have produced a sensation, as if boiling lead were passing through

the intestines. The freedom of spirits, or sensorial energy, that succeeds, can only be appreciated by those who have experienced such disgorgements of vitiated bile! Every one has observed how diseased secretions, from the internal surface of the urethra, occasionally inflame and ulcerate the preputium and glans penis, if the greatest care be not taken to defend them by cleanliness: can we doubt that something of the same nature may take place in the intestines, and even in the ducts of the liver itself, where the biliary secretion is extremely depraved and acrimonious? The *remora* alone of viscid bile in the pori biliarii and excretory ducts of the liver, may often occasion such obstruction in its languid circulation as shall give rise to inflammatory congestion in the organ. As I have shewn, therefore, that with irregular and diminished secretion, there is always a degree of vitiation, absorption, and irritation, I beg leave to designate their united effect on body and mind, by the term "*Morbid biliary irritation, or influence.*"

I conceive that this is quite equal to the task of originating those mental maladies, which in their turn *re-act* on the liver, stomach, and intestines, disturbing their functions still farther, or increasing their torpor, as well as that of the whole system, by sympathy; producing, at length, the extensive catalogue of dyspeptic, hypochondriacal, and perhaps hysterical complaints!

Is it not this "non-secreted bile"* which gives that peculiar sallow complexion to Europeans long resident in hot climates, so distinguishable from a jaundiced suffusion of absorbed or regurgitated bile; and which is probably the first shade that Nature effects, in bending the colour to the climate? Europeans do not begin to assume this *sallow* tint, till the period of superabundant secretion is long past, and till atony and diminished action in the hepatic system have commenced. Indeed it is very possible, that what at first produced such commotion and inconvenience in the animal economy, would, in the course of a few generations, effect those corporeal changes in the exterior, which ultimately counteract, in a considerable degree, the baleful influence of the climate itself. To be more explicit. The derangement in the hepatic functions, originating, indeed, through sympathy with the skin, affects in its turn the tincture of that skin, by means of absorbed and non-secreted bile; and these yellow

* By "non-secreted bile," I mean the elements from whence bile is formed.

and sallow tints, acted on by the rays of a tropical sun, gradually verge, in the course of generations, to a sable hue. This change of colour, and, in some degree, of texture also [for the rete mucosum is *thicker* in Indians than in Europeans] renders the exterior of man less sensible to atmospherical heat; in consequence of which, a more mild and uniform action in the perspiratory vessels succeeds, and by sympathy, a correspondent equilibrium in the secreting vessels of the liver. Thus the skin, which was the first cause of disordered secretion in the liver, becomes ultimately the grand protection of that organ, and the derangement itself, in process of time, creates its own antidote! This is quite conformable to the known wisdom of Providence, and to the unceasing exertions of Nature, in remedying what she cannot entirely prevent.

This is a different doctrine from that of Dr. Smith: he attributes the black colour of Indians to the superabundant secretion of bile, and its suffusion on the surface; but that will not stand the test of examination. He does not take *diminished secretion*, or the elements of bile, into the account; nor does he trace any connexion between the hepatic and cutaneous functions. May not the disposition to ulcers in hot climates, and among drunken sailors in our own climate, be accounted for by this *cutaneo-hepatic sympathy?* In the first case, the *cutaneous* vessels are debilitated by the heat, and the *hepatic* by sympathy. In the second case, the vessels of the stomach and liver are debilitated by *drink*, and the *cutaneous* vessels by sympathy.

The effects of intemperance in spirituous liquors, on the liver and its functions, are not only known to every Tyro in the profession, but are proverbial in the mouths of drunkards themselves; little, therefore, need be said on this subject. But that the "depressing passsions" should produce certain derangements in the hepatic functions, which, re-acting on the mind, give rise to, or aggravate the whole proteian host of hypochondriacal, hysterical, and nervous disorders, is by no means generally admitted; though the doctrine will probably gain ground.

The first effect of these depressing passions in the female sex is felt in the organs concerned in digestion—atony in the stomach—torpor in the liver and intestines. The aliment passes into the duodenum imperfectly digested—it there meets a scanty supply of ill-conditioned or insipid bile, and pancreatic juice. Under these circumstances, the progress of the chyme through the convolutions of the intestines must be slow,

and the chyle imperfectly eliminated. Fecal accumulations take place; and probably the fermentative process goes on, for want of bile, with an extrication of air, which gives rise to distressing colic and borborygmi. To procure relief from these, the spirituous tincture and cordial have often been the harbingers of more dangerous indulgences, and increased the malady which they were intended to alleviate!

By a careful course of cathartics, the bowels are cleared of that load of fecal and other matter, with which they were oppressed. Healthy bile is thus solicited into the intestines, instead of having its elements floating in the circulation. This natural stimulus promotes chylification; which, strengthening the whole material fabric, communicates energy to the mind, till at length, the bloom of health once more revisits the sallow cheek of despondency.

But the lords of the creation are not exempted from the wide-spreading effects of hepatic derangement. From our large manufacturing towns, the foci of sedentary habits, intemperance, and the depressing passions, its influence may be traced through every ramification of society. One or two examples will suffice. The whole of the literary world, from the poet in his garret to the learned president in his hall, feel more or less of its effects. This deficiency in the secretion of bile, the consequence of mental exertion and corporeal inactivity, is evidently the "morbus eruditorum," which

"Sicklies o'er, with the pale cast of thought,"

the countenances of the studious, who waste their hours and their health by the midnight lamp! To them I need not describe the malady; they are too familiar with its various symptoms. But few of them are aware, how far material causes can influence intellectual ideas. If I wish to exert, on any particular occasion, the whole force of my memory, imagination, perception, and judgment, I know, from repeated experience, that by previously emulging the liver and its ducts, and carrying off all bilious colluvies from the alimentary canal, by mercurial purgatives, which also excite a brisker secretion in the chylo-poetic viscera, I am thereby enabled to avail myself of those faculties above-mentioned, to an infinitely greater extent than I otherwise could. This is no theoretical speculation; it is a practical fact. It may help to explain the great inequality which we often observe in the brightest effusions of fancy; and shew us, why even the immortal Homer sometimes nods.

On the Nitro-Muriatic Acid Bath in Bilious Diseases.

This Remedy is now coming so much into use, and affords so decisive a proof of the CUTANEO-HEPATIC SYMPATHY, which I some years ago traced in the production and cure of bilious disorders, that I was naturally anxious to give it a trial in a class of diseases which I have long studied with more than usual attention. I have already seen sufficient, to be convinced that the *Nitro-muriatic acid bath* is a valuable remedy, when aided by proper medicines internally; and I can corroborate the greater number of Dr. Scott's statements relative to its effects on the human frame. From his different papers on the subject, and my own personal observation, the following concise code of instructions is drawn.

§ 1.—*Composition and mode of administration.* Dr. Scott appears to have wavered much in the composition of the bath. In a paper privately circulated among his friends, dated November, 1816, he observes—"I propose, *in future*, to employ three parts of the muriatic to two of the nitric acid—this is the most powerful proportion I have yet discovered;" yet, in a paper dated nearly six months afterwards, and published in the Medico-chirurgical Transactions, he states that his bath is formed of "equal parts of the nitric acid and muriatic acid." His directions for the formation or strength of the bath too, are so very vague as to have deterred many practitioners from adopting his plans. The following will be found a more simple and determinate mode of proceeding.

Into a glass vessel, capable of holding a pint or more of fluid, put eight ounces of water, and then pour in four ounces of the nitric acid of the London pharmacopeia, and four ounces of muriatic acid, or the spirit of salt of the shops. This mixture may be labelled the "*Nitro-muriatic Solution*," and one ounce to a gallon of warm water will form a bath of medium strength, and such as Mr. Astley Cooper commonly prescribes. The proportion may be increased to one ounce and a half, or diminished to half an ounce of the solution to the gallon of water, according to the age, strength, delicacy or other peculiarity of the patient. A bath of two gallons is generally sufficient for the feet and legs. A narrow and deep wooden bucket is the best—such as will bring the water

well up to the knees, without requiring more than eight or ten quarts of liquid. The feet and legs of the patient ought to be immersed in this bath, at a comfortably warm temperature—say 96°—and kept there twenty minutes or half an hour, just before going to bed. This may be done every night, or every second night, and the same bath will remain good for five or six nights. It ought to be kept in the wooden bucket, and a fourth part, or so, warmed up, every time it is used, in a well glazed earthen vessel, and added to the rest, which will make the whole of a sufficiently warm temperature.—Or a fourth part of the bath may be thrown away, and a fourth part of fresh hot water added, with half an ounce of the *Nitro-muriatic solution*, which will obviate the possibility of any decomposition taking place by glazed vessels. But I have not observed any inconvenience from warming up a part of the same bath, in the above-mentioned manner. Dr. Scott thinks that sponging the skin with the bath is equally as good as immersion; and that whether cold or hot, the effects would be the same. In this last I am very far from agreeing with him, and give a decided preference to the *warm* foot bath, or *warm* sponging, for very many reasons which need not now be explained. The strength of the bath must be regulated by the degree of irritability of the patient's skin. It ought, in general, to cause a prickling sensation, when the immersion has continued a quarter or half an hour. The patients usually observe that their feet and legs continue warm, and even in a perspirable state the whole night afterwards.

§ 2.—*Effects of the Nitro-muriatic Acid Bath.* When carried to a considerable extent, so as to bring the system under its influence, it occasionally induces faintness, and a degree of nervous irritation or restlessness, with sometimes a coppery taste in the mouth, and an increased discharge of saliva, but without the mercurial fœtor of the breath.—These effects are very fugitive, and very uncertain. I have known it produce a general itching all over the body, and in some cases, a considerable degree of pain in the soles of the feet.

"The nitro-muriatic acid bath," says Dr. Scott, "appears, "in a particular manner, to affect the glands, and to alter "their secretions; and on this power a great part of its value, "in derangements of the liver, seems to depend.—'*It some-*"*times very suddenly increases the secretion of bile;* and this "effect may be kept up for a length of time. *It increases* "*the perspiration, and often to a great extent.*' The almost

" *instantaneous* effects that it produces on some people, and " its *suddenly causing a flow of bile*, are all unlike a remedy " that is conveyed by the known channels of absorption. I " can suppose that the effects of this remedy do not arise from " the transfer of matter by any set of vessels; *but that they* " *are the consequence of peculiar motions, which it has the* " *power of exciting in the solids, or the fluids of the body.*" Now I appeal to the professional reader whether the above be not a complete admission, in round-about terms, of the *cutaneo-hepatic sympathy*, which I took such pains to elucidate; and as my work on Tropical Climates could hardly be unknown to the author of the above passages, I must say that Dr. Scott has hardly acted with professional candour or liberality in withholding all allusion to that part of my Essay, in which his opinions are corroborated, if not anticipated. On this account, I deem it incumbent on me to shew that *others* have not overlooked the doctrine in question, if he has. In a few months after the publication of my work on Tropical Climates, the following passage appeared in a periodical Journal, from the pen of Dr. Perkins of Coventry, now a resident physician in Brussels. " One recent writer has been " duly sensible of this fact; and his doctrine of *cutaneo-hepatic* " *sympathy* will produce more beneficial revolutions in physic " than have ever been effected by the Stahlian dreams, the " inert phantasies of Hofmanic spasm, or the brilliant but " delusive dogmas and dangerous hypotheses of John Brown." *New Med. and Phys. Journal, April* 1814, *p.* 307.

In an excellent Latin thesis on Dysentery, by Dr. Archibald Robertson, *written long before I had the honour of his acquaintance*, the following passage occurs:—" Omnibus " sane erit voluptati librum totum sed presertim *observationes* " *novas de consensu inter cutem et surculos venæ Portæ et* " *nexu inter sudorem et secretionem fellis*, sedulò perlegere." p. 21. Finally, I cannot be insensible to the opinion of such a man as Dr. Armstrong who, in page 171 of his Essay on Typhus, thus expresses himself:—" The medical public, I conceive, is very much indebted to Mr. James Johnson, for having so clearly illustrated the connection between dysentery and deranged functions of the *skin and liver*."

I am not, however, anxious to claim a discovery, but to propagate a truth. And as the attention of the medical world is now strongly directed to the subject, there can be little doubt of its receiving a proper investigation.

§ 3.—*Disorders to which the Bath is applicable.* Dr. Scott properly observes that there is a very large class of diseases in this country, denominated BILIOUS, which arise from deficient, superabundant, and depraved secretions of bile; hence spring derangements of the stomach, giddiness, feverish heat—head-aches--restlessness at night--cramps and spasms—melancholy, and many of those unhappy feelings to which the term "*Nervous*" has been applied. "In such cases [says Dr. Scott, in a paper privately circulated] let the patient sit in the tepid *Nitro-muriatic acid bath* for the legs, half an hour or less, according to circumstances, every night, or every second night. With some of these biliously disposed people, the first bath, and that in a few hours, produces decided effects. It purges—gives rise to the expulsion of dark-coloured feces *or bright-coloured bile*; or bile of a brown, a green, or black colour, like tar mixed with oil. The pulse, in time, becomes quicker than natural, and a degree of restlessness takes place. These effects may be kept up for a number of days. They are often, however, much longer in appearing. Where the bile is deficient in quantity, the effects of the bath are only known by the feces returning, by degrees, to their natural colour, and by a gradual improvement of the health. With people disposed to bile, it is necessary to keep the bowels very open during the use of the bath; for one of its effects, as I have said, and on which much of its beneficial tendency depends, *is to produce a flow of bile* into the intestinal canal, the consequence of which should be obviated by laxatives. Those inconvenient effects of the bath arise from the very powers which enable it to correct more depraved conditions of the stomach and biliary organs. Although this bath, with little disturbance, produces many happy effects, let it not be supposed that delicate, or even strong people suffer no temporary inconvenience. Let it always, on the contrary, be recollected that the advantages produced by it can never be fully appreciated until the patient has given up the use of it for a considerable time. Even those who feel no very sensible effects from it at the moment, generally, in the end, find their health improved.

"The great remedy at present for bile, is calomel, or mercury in some form; but this it is necessary, after a time, to repeat. The very same thing is true of the bath. When the bilious feelings return, it must be repeated. Patients must themselves discover how long they can go without its use, and when they return to it, two or three bathings of the

legs, or washing the hands and arms for a few minutes with the *Nitro-muriatic bath*, or sponging the body more largely, will generally be found to bring relief. The periods of health gradually become longer and longer, till a complete recovery of it is effected."

As sponging the body with the N. M. water has nearly the same effects as the foot-bath, a small quantity may, at any time, be easily prepared by adding one drachm of the "*Nitro-muriatic solution*" to each pint of warm water, in a common wash-hand bason. By means of a large sponge, the thighs, legs, stomach, chest, or arms may be wetted with this mixture for ten or fifteen minutes daily. Or the above-mentioned parts may be sponged alternately. With delicate people, or those who are very sensible to this remedy, it is often sufficient to immerse one hand, or wet one arm in the bath, for a few minutes. Washing both hands, or hands and arms daily will frequently be quite sufficient for delicate bilious patients.

This remedy bids fair to produce important effects in a certain class of infantile diseases where the liver and bowels are deranged, which indeed is more commonly the case than is imagined. My friend Mr. Webster, Surgeon of the 51st Regiment, has witnessed the most decided salutary effects of the bath in his own child afflicted with jaundice. The great effusion of bile into the intestines, which almost immediately supervened on the employment of the bath, afforded a fine specimen of the *cutaneo-hepatic sympathy* in question. —Indeed the beneficial effects which result from the *common warm bath* in the diseases of children, are most striking, and as these effects are greatly increased by the addition of the *Nitro-muriatic acid*, we may fairly anticipate the most important advantages from this measure.

But, as will be plainly observable from the preceding remarks, the necessity of watching the functions of the various viscera, during the use of the bath, will be sufficiently obvious; and the judicious administration of appropriate medicines, while the patient is under its influence, must infinitely enhance its powers, and hasten the recovery of the patient.

DYSENTERY.

Sec. X.—The disease in question is certainly one of great importance to be acquainted with, in the practice of fleets and armies. No other complaint—not even excepting fever, so much puzzles the young beginner; and for this plain reason, that in the hour of danger, both books and men distract his judgment, and paralyse his arm, by their diametrically opposite directions! Let any one, after reading Dr. Harty's volume on Dysentery, which gives a fair compendium of the principal modern opinions and practices in that disorder, be taken to the bedside of a patient, and he will be utterly unable to decide, in his own mind, upon the mode of treatment most eligible to adopt!

From this state of anxiety, is he relieved by applying for advice to men? By no means. One inspector tells him, he must consider dysentery as closely allied to *enteritis*, and depend principally on *venesection*.* Another comes round, and says, strictures in the colon, or small intestines, are the cause of dysentery, occasioning a retention of the fecal ond other "*peccant matter;*" therefore he must purge. A third assures him, he will purge his patient to death, and that nothing but *sudorifics* can effect a cure. A fourth informs him, that *mercury* is a specific, and unless he raises a ptyalism, he will bury his patient. In this state of suspense, he vacillates from one direction to another, and his success is less, than if he pertinaciously adhered to the worst plan proposed.

It is true that experience will, *in general*, determine his choice; but many an anxious hour will he spend, in exploring his way through this labyrinth of opinions, and many a blunder will he commit in the mean time!

As there is hardly a disease in the whole range of nosology, more uniform in its nature and symptoms, than dysentery, this discrepancy among authors and practitioners must have originated, I conceive, in consequence of mistaking prominent *effects* for proximate *causes;* and as the means of cure directed against the former have often removed the latter, each individual believed that he alone had found out the true

* Vide Dr. Wright on the Walcheren fever; also Dr. Somers on extreme bleeding in dysentery of the Peninsula.

cause and cure of the disease. Thus, one physician examining the body of a patient who died in a certain stage of dysentery, and finding many traces of inflammation, or even sphacelus, in different parts of the intestines, without any strictures, frames his inflammatory hypothesis; and although he employs, as *auxiliaries*, some of the means recommended by others, he makes venesection the *principal* indication—has tolerable success, and becomes quite satisfied that he has hit on the proper plan. Another patient dies at a less advanced period of the disease, or where mortification had not relaxed, and effaced all signs of stricture. He is examined by a different physician, who finds the inner coat of certain parts of the intestines corrugated, thickened, and the canal reduced to a very small diameter, with scybala, or rather fecal accumulations [for those who talk about scybala, have not, I fear, examined the abdomens of many dysenterics,] lurking in the cells of the colon, or flexures of the small intestines, situated above these strictures. Establishing a doctrine on this, bleeding is only had recourse to occasionally; and certain medicines, supposed to have the power of relaxing these spasms or strictures, are exhibited, with frequent laxatives, and success is often the result.

A third person, in examining the bodies of dysenteric patients after death, in hot climates, finds abscess, or other organic derangement of the liver, an appearance very common; and concludes that Dysentery is Hepatitis in disguise. He prescribes mercury, and his success is still greater than that of others; consequently he is *positive* that he alone pursues the true course, and entertains just ideas of the disease.

A fourth, observing that dysentery is always accompanied with defective perspiration, and taking up the idea of Sydenham, that it is a fever turned in on the intestines, has recourse to sudorifics, to turn it out again, and not without considerable success; so that he pities the blindness of those who cannot see that the disease is merely "the perspiration thrown on the bowels." How are we to reconcile these jarring opinions and practices? In adhering obstinately to any one of these plans we will be often right; but assuredly we will be not seldom wrong. On the other hand, by giving a discretional power to adopt one or other of them, as symptoms may indicate, we confer a licence on the young beginner, for which he probably will not thank us in the hour of trial or responsibility. He who could lay down one fixed

principle, which is uniformly to be kept in view, through every case and every climate,—a principle that would explain the phenomena and the cure; who could give *plain and easy directions* when and where we are to lean towards one or other of the apparently opposite modes of treatment, without ever losing sight of the principle in question, or, for a moment, relaxing in the pursuit of that salutary object which this principle points to, would certainly deserve the thanks of the junior branches, at least, of the profession.

I have hinted what I supposed to be the origin of these clashing theories and practices; to wit, the mistaking effects for causes. Thus, if we do find stricture in any part of the intestinal canal, what produced it? This must evidently be the effect of some cause. If we find inflammation there, it is proved to be a consequence, and not a cause of dysentery, from this plain fact, that in original and unequivocal inflammation of the bowels, or enteritis, constipation is almost always present. In hot climates, if we find dysentery, or [as some will not allow it that name] flux, a pretty constant attendant on Hepatitis, particularly the languid or chronic species of it, it does not follow that Hepatitis is a general concomitant, much less a cause of dysentery. In many cases of Hepatitis, especially when violent, there is obstinate costiveness; and in numerous fatal cases of dysentery, no structural derangement in the liver can be observed.

Those who have attributed it to suppressed perspiration, have come nearer to, but stopped far, very far short of, the mark. The suppression of this discharge is, in itelf, a trifling, though in its connexion with others, it becomes an important feature in the proximate cause of dysentery.

As causes can only be traced by their effects, we must endeavour to find out, among the latter, such as are *always* present in dysentery, and have a decided *priority* in occurrence. These, I conceive, constitute what is meant by proximate cause in this, as well as in every other disease. Are there any such, then, in dysentery? I believe there are; and this belief does not rest on speculative grounds. I have not learnt the knowledge of this disease from the ancients nor the moderns, but studied it in the book of Nature; and every one of its symptoms has been deeply impressed on my memory, by painful personal experience, both within and without the tropics.

In every case of dysentery that has ever come within the range of my observation, [and the number has not been

inconsiderable] two functions were invariably disordered from the very onset, and soon drew other derangements in their train. These were, the functions of the skin and of the liver; or, perspiration and biliary secretion, I defy any one, who has minutely regarded this disease at the bedside, to produce a single instance in which these functions were carried on in a natural manner, at any period of the disease. The partial clammy sweats which are sometimes seen on the surface, with the occasional admixture of bilious sordes in the stools, so far from being objections, are proofs of this position; for, excepting the above appearances, which are *unnatural*, the regular perspiration is suppressed, and the healthy secretion of bile entirely stopped. Dr. Balfour, who had some twenty years' experience in this complaint, and who treats of it under the name of "*putrid intestinal remitting fever*," states, at page 17 of his second Treatise on Sol-Lunar Influence, that—"At the *very beginning* of putrid intestinal fevers, and also about the time of their *final crisis*, or termination, I have often observed copious discharges of recent bile; but as the fever advanced, and remained at its height, such discharges have frequently *ceased to appear*; and I have been led to suspect, from these circumstances, that the passage of the bile into the duodenum, during this interval," [viz. from the very beginning to the crisis or termination] "was *altogether stopped*." I beg the reader will keep this in mind.

These, then, are the two first links of that morbid chain which connects the remote cause with the ostensible form of the disease. Whoever can break these, by restoring those two functions to their natural state—I care not by what means or medicines—he will cure, or rather prevent, the disorder.—But we can seldom expect to be called in at this early period, for Dysentery is not yet manifested; although an accurate observer might, in his own frame, often detect these nascent movements, and, by prompt measures, extinguish the disease *in embryo*.

Some other invisible, at least, very obscure links, are now to be noticed:—for however confidently a *proximate cause* may be decided on in colleges and closets, it is, in nature, a series of causes. The equilibrium of the circulation and excitability becomes disturbed. In consequence of the torpor in the extreme vessels on the surface, the volume of blood is directed to the interior, and the balance is still farther broken by the check which the portal current meets in

the liver, from a corresponding torpor in the extreme or secreting vessels of that organ; the effect of which is, that the plethora in the cœliac and mesenteric circles is now greatly augmented, and febrile symptoms commence. The perspiration being stopped, a vicarious discharge of mucus and acrid serum is thrown from the extremities of the turgid mesenteric vessels upon the internal surface of the intestines, which by this time are in a state of irritability.* The disease now begins to exhibit itself unequivocally, by the uneasiness in the bowels, the frequent desire to stool, and the mucous discharges. We may now plainly perceive how all those consequences, which have so often passed for causes, can arise. If the plethora be great, blood itself will be poured out from the mouths of the distended mesenteric and meseraic vessels; hence inflammation and ulceration may ensue. If any hardened feces lurk in the cells of the colon, they will be grasped by the irritable circular fibres of the intestines, and rings or strictures will augment the tormina and griping in the bowels.

In this situation, Nature evidently attempts to restore, by re-action, the balance of the circulation and excitability with the cuticular and hepatic functions, but she rarely succeeds; her abortive efforts too often aggravating, instead of relieving the symptoms. Thus we sometimes see a partial, ill-conditioned sweat on the surface, which is productive of no benefit; while from the liver, an occasional gush of vitiated bile, like so much boiling lead, throws the irritable intestines into painful contortions, and then the tormina and tenesmus are insufferable! Nature, to say the truth, is but a sorry physician in Dysentery. "In hoc enim corporis affectu," says Sir G. Baker, "aliquod certe in medicina opus est, haud mul-"tum in *Naturæ* beneficio." Where she ultimately gains her end, it is where the local plethora is reduced by the discharge from the mesenteric and meseraic vessels, without occasioning much organic derangement in the bowels. This being effected, she more easily restores the equilibrium of the circulation and excitability and the functions above-mentioned. But, in a great majority of cases, where the disease is violent

* It may be observed that the same phenomena take place in most tropical fevers, and also in severe cases of cholera morbus, mort de chien &c. This I grant; for the same causes that, applied to one person, produce bilious fever, will in a second give rise to hepatitis—in a third to mort de chien—and in a fourth to dysentery, according to the organ that happens to be most predisposed to disease. Nay, a combination of all these diseases will often be found in the same case.

her exertions either hasten the fatal catastrophe, or produce such lesion of structure and function in the chylopoetic viscera, as induces a tedious chronic state of the complaint, very difficult to manage.

The febrile symptoms will, at first, be in proportion to the *general* disturbance in the balance of the circulation and excitability; they will afterwards be kept up, or modified, by the extent of the organic derangement sustained. The discharge of blood by stool, on the other hand, appears to be proportionate to the *local* plethora in the portal and mesenteric circles, and to the permanence and degree of torpor in the liver, occasioning that plethora.

This doctrine, thus briefly sketched out, if impartially considered, and fairly applied, will, I think, clearly account for every phenomenon of the disease, from the derangement of the liver, the largest of all glands, to that of the mesenteric glands themselves, which have, in their turn, been considered as the seat, or even the cause of dysentery.

But it is not sufficient that it merely accounts for the phenomena. If founded in nature and truth, it should, like an arithmetical rule, prove itself in various ways. Above all, the practical application of it ought to involve no contradictions; however various the routes may appear, they must all be shewn to tend ultimately to one point—the cure. It should explain how different means have attained the same end; and, finally, it should chalk out the best and nearest path we are to pursue. To this task I consider the doctrine in question perfectly equal; though I shall not apply it farther than to the leading phenomena of the disease, and the principal methods of cure.

Of the former I have spoken; I now come to the latter. The practitioner who has set down an inflammatory state of the intestines as the cause of dysentery, comes to a patient, who is very ill with violent tormina and tenesmus; and passing blood, in alarming quantities, with his stools, which consist of nothing but that and mucus. He bleeds copiously, as his principal indication, and prescribes laxatives or sudorifics as minor means, and in a trifling way, as auxiliaries. He soon finds that the flow of blood by stool is much reduced—that the tormina are mitigated, and that something more than mere mucus comes away after the laxatives, with considerable relief to the patient. Nothing can be more plain than the way in which these means are beneficial, on the principle in question. Venesection lessens at once the ple-

thora in the mesenteric vessels, and checks the effusion from their mouths. A general relaxation throughout the whole system follows—intestinal strictures are relaxed—scybala and fecal accumulations pass off; and Nature, thus relieved, attempts a restoration of equilibrium in the circulation and excitability, evinced by some degree of action in the extreme vessels on the surface, and, by sympathy, of the secreting vessels in the liver.

So far the physician has greatly assisted the spontaneous efforts of the constitution; and if the latter be equal to the task of keeping things in this prosperous train, all will be well—If not, the morbid state returns, and with it a fearful debility, which paralyses his arm, and embarrasses his mind! His patient may, or may not recover; but I should not like to be in his situation, under a man who confines his principal aim to the obviating of inflammation.*

He who confides in purgatives, [and a great many do, who know little of the complaint] from an idea, that stricture and a retention of the natural feces are the essence of dysentery, treads on exceedingly tender ground. He certainly does assist Nature in her most ostensible, but dangerous method of cure. If, by a course of purgatives, he can lessen the local plethora, and excite the healthy action of the liver [both which objects evacuating medicines, particularly of the mercurial kind, are without doubt calculated to effect] before any material injury takes place in the intestinal canal, he will succeed; because the general balance of the circulation will soon be restored, when the portal and mesenteric plethora is removed; and the sympathising function of the skin will participate in the healthy action of the liver. But in a large proportion of cases, he will have the mortification to find, that such organic derangements occur, before he can attain his object, as will either hasten the fatal termination, or prove a fruitful source of misery in the chronic stage of the disease, which too often ensues.

The rationale of the emetic and sudorific plans, on the principle in view, is sufficiently obvious. They not only

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* Since the first edition of this work was printed, Dr. Somers has drawn the attention of the medical world to *extreme* venesection in dysentery as it appeared on the Peninsula. But I believe that experience, in tropical climates at least, will only assign venesection its proper rank as a powerful *auxiliary* in the treatment of this formidable disease. Dr. Somers has not the honour of originality here. Dr. White used the same *venesectio ad deliquium*, in Egypt, in 1802.

determine generally to the surface, but, by exciting the healthy action of the liver, they locally relieve the meseraic and mesenteric plethora [a circumstance which their employers did not calculate on], and thus restore the balance of the circulation with the functions of perspiration and biliary secretion.

But however beautiful this plan may be in theory—however successful it may be in a few sporadic cases of dysentery in private life, or in a well-regulated hospital, a more *utopian* practice for fleets or armies, in a tropical climate, was never seriously recommended for general adoption! Much do I suspect that those who praise or propose it, have never put it to the test of experience, except on a very confined scale, and with every convenience at hand. "There would be this inconvenience," says the judicious Dr. Blane, "*in constantly encouraging a sweat*, that if the tenesmus should return, it [perspiration] would either be *checked* by the patient getting frequently out of bed, or there would be danger of his catching cold."—*3d ed. p.* 457.

The mercurial plan is of a very different stamp, in regard to its applicability. Indeed, the *empirical* exhibition of mercury, as it is called, in hepatic and dysenteric complaints abroad, has quite shocked the feelings of some physicians at home. But the army or navy surgeon, who has a vast number of dysenteric patients coming every day under his care, smiles at these delicate scruples. He knows, by repeated observation, that if he can bring on free ptyalism, the patient is secure for that time; and this begets a strong bias in favour, either of the *specific* power of mercury, or of the liver being the primary seat of the disease. With these prepossessions, he drives on for the object in view, regardless of particular symptoms and disdaining to call in the aid of those means which I have been describing, and which are considered by others as the principal remedies. He is generally, however, successful; and if he knew to what extent he might go with safety in this empirical manner, he would be still more so, as shall be shewn in due time. But occasionally he is foiled, and cannot raise a ptyalism—then his resources are gone! The patient wastes away—inflammation, ulceration—even gangrene, may supervene; or, some morning, he sees, with astonishment, several inches of the rectum, that have passed off by stool in the night! This has happened under my own care, and *I know* that the same has occurred to several others.

Thus we see, that any one of the above methods, when set up as a principal to the exclusion of others, is attended with inconvenience, and [excepting perhaps the last] with repeated failures, if not general want of success, particularly in hot climates. A heterogeneous combination of them all, on the other hand, without order or discipline, and guided only by the discretion or caprice of the young practitioner, would be little better, if not worse, than a blind adherence to one. Nothing, in short, but a controlling principle, that is ever to be held in view, under whose superintendance the above-mentioned agents are to be employed in their proper spheres, can lead to a settled and rational practice in dysentery, or reconcile those jarring opinions and practices, with which both books and men continue to puzzle the minds of all those whom personal and wide experience has not emancipated from the trammels of authority.

I have declared the *principle* that is to govern us, [the restoration of *healthy* perspiration and biliary secretion, with an equilibrium of the circulation and excitability] and enumerated, in a general way the means which we are to use;—the direct application of the whole to practice, will be illustrated presently, by an appeal to facts.

I have purposely avoided, as much as possible, throughout this essay, to quote my own cases, in support of my own doctrines. The following short narrative, however, may be allowed a place here; and may not be uninteresting or uninstructive:—

A very few weeks after my first arrival in Bengal, I made one in a party of officers, who landed a few miles below Kedgeree, for the purpose of shooting and of seeing the country.—The day was excessively hot—the ground was half inundated, and we waded and rambled about, through marshes, jungles, and paddy-fields—often with one-half of our bodies under water, and the other broiling in the sun, till we were fairly exhausted. As we had a sumpter-basket with us, we spent the whole day in this manner; and on returning in the evening, to the banks of the Ganges, at a place appointed, we found that the boat could not approach the shore, the water was so shoaly; we therefore dashed into the river, and waded off to where the boat lay at a grapnel. By this time it was sunset, and as we had a strong tide against us, we sat in the boat nearly two hours, dripping wet, and shivering with cold, before we got on board. That night, my sleep was disturbed, and I felt slight rigors or chills, alternated with flushes of

heat; but in the morning I got up as usual, and concluded that all was well. At dinner I had no appetite; and soon afterwards I felt uneasiness in my bowels. As the evening advanced, I had frequent calls to stool, with griping, and some tenesmus, nothing coming away but mucus. Fever now came on—my skin became hot, dry and parched,—and by 11 o'clock at night, I could scarcely leave the commode. The misery of that night will never be erased from my memory! I was often delirious, especially when I lay down in bed; but indeed so dreadful were the tormina and tenesmus—so incessant the calls to stool, that little respite could be procured. I had taken a dose of salts in the evening, but they afforded very trifling relief, except by bringing off some feculencies, attended with a momentary lull. Early in the morning, a medical gentleman, belonging to an East-Indiaman, visited me, and found me in a very bad way. I was now passing blood fast, and the fever ran high. I was bled, and took an ounce of castor oil immediately; a few hours after which, six grains of calomel, and one of opium, were taken, and repeated every five hours afterwards, with occasional emollient injections.

The day passed rather easier than the preceding night—the tormina were somewhat moderated by the medicine; but I had considerable fever—thirst—restlessness, and continual calls to stool; nothing, however, coming away, but mucus and blood. As night closed in, the exacerbation was great. The opium lulled me occasionally, but I was again delirious; and the phantoms that haunted my imagination were worse than all my corporeal sufferings, which were, in themselves, indescribably tormenting. The next day I was very weak; and so incessant were the griping and tenesmus, that I could hardly leave the commode. The tenesmus was what I could not bear with any degree of fortitude; and, to procure a momentary relief from this painful sensation, I was forced to sit frequently on warm water. The calomel and opium bolus was now taken every four hours, with the addition of mercurial frictions. An occasional lavement was exhibited, which gave much pain in the exhibition, and I each day took a dose of castor oil, which brought off a trifling feculence, with inconsiderable relief. My fever ran higher this day than yesterday, with hot, dry, constricted skin. As night approached, my debility, and apprehension of the usual exacerbation brought on an extreme degree of mental agitation. The surgeon endeavoured to cheer me with the hope of

ptyalism, which, he assured me, would alleviate my sufferings —I had then no local experience in the complaint myself. As the night advanced, all the symptoms became aggravated, and I was convinced that a fatal termination must ensue, unless a speedy relief could be procured. I had no other hope but in ptyalism; for my medical friend held out no other prospect. I sent for my assistant, and desired him to give me a scruple of calomel, which I instantly swallowed, and found that it produced no additional uneasiness—on the contrary, I fancied it rather lulled the tormina. But my sufferings were great—my debility was increasing rapidly, and I quite despaired of recovery! Indeed, I looked forward with impatience to a final release! At four o'clock in the morning, I repeated the dose of calomel, and at eight o'clock [or between 60 and 70 hours from the attack] I fell, for the first time, into a profound and refreshing sleep, which lasted till near midnight, when I awoke. It was some minutes before I could bring myself to a perfect recollection of my situation prior to this repose; but I feared it was still a dream, for I felt no pain whatever! My skin was covered with a warm moisture, and I lay for some considerable time, without moving a voluntary muscle, doubtful whether my feelings and senses did not deceive me. I now felt an uneasiness in my bowels, and a call to stool. Alas, thought I, my miseries are not yet over! I wrapped myself up, to prevent a chill, and was most agreeably surprised to find that, with little or no griping, I passed a copious, feculent, bilious stool, succeeded by such agreeable sensations—acquisition of strength, and elevation of spirits, that I ejaculated aloud the most sincere and heartfelt tribute of gratitude to Heaven for my deliverance! On getting into bed, I perceived that my gums were much swollen, and that the saliva was flowing from my mouth. I took no more medicine, recovered rapidly, and enjoyed the best state of health for some time afterwards.

Mr. Curtis may denominate this disease, "Bilious fever and flux," or "Hepatic flux," but as it answers to every part of Dr. Cullen's definition, except the *erroneous* part, I must say, that it is a very fastidious multiplication of distinctions without any real difference.* The "nature of the discharge" has led Mr. Curtis, and many others, astray. Often have I been told by Gentlemen that their patients were passing great

* Vide Curtis on the Diseases of India.

quantities of bilious redundancies, when, upon examining the stools, four-fifths of these were composed of mucus, *tinged* of various hues, with vitiated bile and blood. It is astonishing how small a quantity of the former will communicate even a deep colour to any other fluid. Mr. Curtis's practice, too, consisted almost entirely in purgatives; consequently, what with this and the previously disordered state of the liver and its functions, we need not wonder that considerable quantities of depraved bilious secretions were brought off during the treatment. But these accidental varieties in the appearance of the discharge, arising from local causes, and greatly modified by the means employed for cure, do not authorise us to change the name of the disease. Such appearances have been observed in all countries, especially in autumnal seasons, and where purgatives formed a prominent feature in the *methodus medendi*. They have even led to the idea, that bile was the cause of Dysentery.

Of the *remote* causes I need say little. They are the same in all parts of the world—atmospherical vicissitudes. Perspiration and biliary secretion being in excess during the intense heat of the day, are so much the more easily checked by the damp chills of the night, and the consequences which ensue are clearly deducible from the principle I have stated. In short, the same general causes produce bilious fever, hepatitis, and dysentery. They are three branches from the same stem, the organs *principally* affected occasioning the variety of aspect.

Dysentery, *ceteris paribus*, will be the most frequent form: first, on account of the injury which the intestines are in the habit of previously sustaining, from the irregular or disordered function of the liver, whereby they become weakened and irritable; secondly, because they are destined, by Nature, to sustain the vicarious afflux of suppressed perspiration. They are all cured on the same principle, and with some slight variety, arising from local circumstances, by the same remedies—a strong proof of the connexion which I have traced.

We now see how a few years' residence in hot climates predisposes heedless soldiers and sailors to Dysentery, as remarked in the section on Yellow Fever, by the experienced author of that article, and as is well known to those who have practised between the tropics. The same principle explains the reason why we so frequently find Dysentery a concomitant on Hepatitis, especially that languid

species of it, arising from obstruction and congestion, with previous derangement of function in the liver, rather than acute European inflammation. In the latter, as in enteritis, the bowels are, for the most part, costive. We next proceed to the cure, and various practical remarks connected with it.

There are two safe and comparatively effectual modes of curing Dysentery. I shall point out the principal remedy in each method first, and notice the subordinate auxiliary ones afterwards. One method is, to give mercury, in comparatively small doses, either alone, or combined with an anodyne, or with an anodyne and diaphoretic [which I prefer] in such a manner, that from 24 to 36 or 48 grains of calomel, according to the urgency of the symptoms, may be exhibited, in divided portions, at three, four, or six-hour intervals, during the course of the day and night. In the same space of time, from two to four grains of opium, and from ten to fifteen grains of antimonial powder or ipecacuan, may with advantage be administered, in combination with the calomel. One or two doses, at least, should be given, before a laxative is prescribed; and an ounce of castor oil is the best medicine I can recommend for the latter purpose. It will often bring away hardened fecal, or vitiated bilious accumulations, when the irritability of the intestines is previously allayed by the calomel and opium; and it will, in that manner, soothe the tormina and tenesmus. But although it may be repeated every day, it is never to interrupt the progress of the main remedy.

When blood appears alarmingly in the stools, whether the fever run high or not, venesection may be employed without the smallest apprehension of that bugbear—DEBILITY.—Emollient oily glysters may also be occasionally thrown up, to lull the tenesmus; but as the rectum is generally in a very irritable state, glysters are often unmanageable remedies. A flannel shirt is to be put on, and a bandage of the same with a double or treble fold of flannel round the abdomen, which is to be rubbed, once or twice a-day, with a liniment, composed of mercurial ointment and tincture of opium, well incorporated. By a steady perseverance in this simple plan, for a few days, the mouth will become sore, and every bad symptom vanish.

Thus, in less than a page, is stated a practice, which being founded on principle, is generally applicable to almost every stage and degree of Dysentery, and contains within itself resources against most emergencies. While we proceed

directly forward to our final object—the restoration of the cuticular and hepatic secretions, with an equilibrium in the circulation and excitability, by a combination of mercury and diaphoretics, we lull pain, and relax strictures, at the same time, by the opium. To guard against inflammation of the intestines, we have the lancet on one side—and to carry off diseased, or irritating accumulations, we have laxatives on the other; the fever, being principally symptomatic, will, of course, cease with the cause. For the successful issue of this treatment, in general, I appeal to the rigid test of future experience with others, perfectly conscious, from my own, of its superior efficacy.

This was the usual method I pursued, and with results far exceeding my most sanguine expectations. In some cases, of more than common violence, I was occasionally led into a practice somewhat different, which will be noticed presently.

It is a little singular, that no two medical gentlemen on the station, agreed exactly in the mode of administering mercury —each was probably attached by habit to his own formula: but in one thing they were all unanimous—its astonishing power over the disease. This speaks for itself. I shall here exhibit a few specimens of the practice adopted by some of the most intelligent surgeons, and who had the longest and most extensive experience in the Eastern hemisphere.

Mr. Rowlands, surgeon of H. M. S. Tremendous, [now surgeon of Halifax hospital] when called to a dysenteric patient, prescribed, first of all, a dose of sulphate of magnesia or soda; immediately after the operation of which, one grain of calomel was given every half-hour, without interruption, till ptyalism took place, which was generally on the third day. Scarce any other medicine was employed, except bladders of warm water to the abdomen, and the anodyne mercurial ointment, which I have already noticed.

Mr. Henry, surgeon of the Trident, a gentleman who passed a great number of years in India, and had ample experience, proceeded on the following plan: ten grains of calomel were given three times a-day, till ptyalism ensued; interposing occasional laxatives—generally castor-oil, or salts; and in the more advanced stages of the disease, combining small doses of opium with the calomel.

Mr. Shields of the Centurion, a very experienced surgeon, commenced with a dose of castor oil in mint water, and after it had taken effect, prescribed an anodyne antimonial draught in the evening. Mercury was then administered in the follow-

ing formula:—calomel, a drachm, ipecacuanha, half a drachm, opium, gr. xii. These were made into twenty-four pills, two of which were taken three or four times a-day, according to the urgency of the symptoms, till salivation came on, with an occasional laxative of castor oil.

Mr. Scott, surgeon of the Caroline, a judicious practitioner, and who, like myself, had been—"severely taught to feel" the violence of this disease, as well as of Hepatitis, pursued the following method: A saline cathartic [magnes. sulphat. an ounce,] was first ordered, and, after its operation, an anodyne diaphoretic draught in the evening. From this time, mercury was given as follows: calomel, a drachm, opii. gr. iv. saponis q. s. ft. pil xx. One of these to be taken every two hours, till ptyalism ensued, interposing a laxative when griping was troublesome, and giving an anodyne draught every night.

It would be useless to multiply examples—the above are sufficient to give an idea of the general practice pursued in the East, and form so many living testimonies of its efficacy, of which not a shadow of doubt can be reasonably entertained.

I have now to notice a still bolder track which was followed by a few surgeons in that quarter, without the least communication of sentiments on the subject—each conceiving his own plan to be perfectly unique. I have mentioned that, in my own case, when despairing of recovery, I took, in one night, two scruple doses of calomel, without experiencing any increase of the tormina, or urgency to stool; but on the contrary, with an apparent alleviation of those distressing symptoms. Although this circumstance did not make much impression on my mind at the time, as I considered it merely accidental; yet, when some of my patients afterwards appeared in similar situations, and I was in great anxiety about the event, I ventured to have recourse to the same measures, and never in any one instance, with injurious effects, but very generally with an amelioration of symptoms, and an acceleration of the object in view—ptyalism. Emboldened by this, I afterwards tried calomel in scruple doses, two, three, or even four times a day, without any other medicine whatever; and found that it almost invariably eased the tormina, and lessened the propensity to stool; and, upon the whole, brought on ptyalism sooner than any other plan of smaller and more frequent doses. In one or two instances, however, it produced great nausea and sickness at stomach, with spasmodic affections of different parts of the body, which were

soon removed by an opiate, combined with a diaphoretic, to determine to the surface. I did not indeed, adopt this practice generally, being quite satisfied, in ordinary circumstances, with the plan which I have above detailed. But whenever, in doubtful cases, I had occasion to push boldly on for ptyalism, I gave the calomel in scruple doses; which I found, by repeated experience, to sit easier than either a smaller or a larger quantity of that medicine—a curious, but a certain fact.

I was surprised, long after this, to find that a German assistant-surgeon, who had charge of my patients for some time, while I was at sick quarters on shore, made it a very common practice to cure dysenteries in this way. But the following table will shew, that experience had pointed out the knowledge of this fact to others also.

Tabular View of Thirty Cases of genuine idiopathic Dysentery, treated with Calomel, in Scruple Doses, on board H. M. S. Sceptre, in the East Indies, by Mr. JOHN CUNNINGHAM, *Surgeon of that Ship.* 1805.

Mens' Names.	No. of days under cure, before the purging stopped.	No. of days on the list afterwards, before fit for duty.	Total number of days on the list.	Scruples of calomel, taken in scruple doses, twice or thrice a day.	Remarks.
Henry.....	3	10	13	*Scr.* VI	Average number of days before the disease was checked, 4. Average convalesence afterwards, 7. Average no. of days on the list, *in toto*, 11. Average no. of scruples of calomel taken, 7 & half by each man. Of 231 cases of dysentery, treated with calomel in different ways, 6 died. Of the last 60, treated in the annexed manner, none died.
Davis.....	4	3	7	X	
Kenan.....	4	3	7	V	
Jackson....	4	5	9	IV	
Humpheries	6	14	20	VIII	
Cradock.....	8	5	13	XII	
Paterson....	2	3	5	IV	
Vinton.....	6	7	13	IX	
Connor.....	3	10	13	V	
Richardson..	4	9	13	V	
Mabley.....	9	3	12	XII	
Smith.....	4	6	10	V	
Dixon.....	4	3	7	VI	
Noble.....	6	12	18	XIII	
Smith (2)...	3	11	14	VI	
Williams....	4	6	10	IV	
Murray.....	3	6	9	V	
Stendon....	2	7	9	IV	
Palmer.....	4	7	11	VII	
Lum.....	3	11	14	V	
Salter.....	8	5	13	XVIII	
Stoner.....	5	3	8	IX	
M'Cormick	4	6	10	V	
Stoneham....	8	13	21	XV	
Kinch.....	2	5	7	IV	
Smith (3)...	4	16	20	IX	
Bell.....	2	3	5	III	
Whitehurst..	4	13	17	X	
Kenan (relapsed)....	3	7	10	VI	
Wilmot.....	4	6	10	XII	

If this document, confirming what I have related before, does not remove every doubt or prejudice from the minds of European practitioners, they must be proof against the impressions of truth. It is accompanied by the following remarks:—

"I am perfectly convinced," says Mr. Cunningham, "that this is the most successful method of speedily impregnating the system with mercury, because it does not excite the alvine discharge, so as to carry off the medicine by stool, as I have too often found smaller doses do.* As far as I could observe, larger doses than a scruple had the same effect as smaller, in aggravating the griping and purging. The whole amount, of my experience, then, in the treatment of more than 200 cases of genuine idiopathic dysentery, is this:—that calomel, administered in scruple doses twice or thrice a day, is an almost certain remedy for dysentery—in hot climates, at least. There is no occasion to continue its use longer than till the symptoms fairly give way. But in obstinate cases, the system must be well impregnated, before a permanent cure can be expected. When the griping or fixed pain in the bowels ceases after the administration of a few scruples, and especially if the ptyalism be appearing, although the stools may continue frequent, it will be prudent to omit the medicine for a period or two, to ascertain the consequence; for it generally happens that, under such circumstances, the purging also subsides, as the ptyalism rises, and entirely disappears with the cessation of the mercurial action, which ought always to be allowed to abate gradually of itself, without purgatives or diaphoretics, otherwise a disagreeable return of the purging may be the result.

"I ought to notice, that although dysentery prevailed in the Sceptre to a greater extent than in any ship of her class in India, during the time I belonged to her, yet not a single instance of hepatitis, supervening on the former disease, occurred. This was attributed by others, as well as by myself, to the liberal manner in which I prescribed mercury for the cure of dysentery, which I am convinced has some intimate connexion with hepatitis. In the Albion and Russel, where much less calomel was used, liver complaints were very prevalent. The foregoing table exhibits the quantity of calomel taken, and the time required for the cure of the last thirty

* Mr. Cunningham had a great prejudice against opium in this complaint, which accounts for the remark on small doses of calomel. A small proportion of the former medicine will completely obviate this effect, without any injury, especially if determined to the skin by diaphoretics.

cases of dysentery, without any selection, that came under my care." I may here add, that Mr Cunningham, by way of experiment, took, when in perfect health, three scruple doses of calomel in one day; the only effect of which was an indescribably pleasant sensation along the line of the alimentary canal, with one natural stool in the evening. Mr. Neill, of the Victor, was also in the habit of giving calomel in scruple doses, for the cure of dysentery and bilious fever, with great success, and without ever experiencing any inconvenience from the largeness of the quantity.

Since the first edition of this work appeared, numerous testimonies in favour of *scruple* doses of calomel in dysentery have been published by able practitioners. They unanimously confirm the effects which Mr. Cunningham and myself have described, and some ingenious naval surgeons are now in the habit of giving calomel in these doses for the cure of recent chancre, asserting that a more speedy and effectual stop is thus put to the syphilitic virus, than in any other mode of administration. Mr. Cunningham, lately surgeon of H. M. S. Rochefort, and assistant-surgeon Boyle, of the Royal Navy, have adopted this plan, in different parts of the world, and without any communication of ideas on the subject.

If it be still urged, that there is something peculiar in the nature of India fluxes, which renders them tractable under mercury, and that the same treatment will not succeed in the West, I happen to have before me a document, which will go far to settle that point. In the years 1809 and 1810, fever and dysentery prevailed to a great extent, on board H.M.S. Sceptre, in the West Indies. Mr. Neill was surgeon of the ship; and adopting the Eastern practice, with which he was well acquainted, his success was equal to his hopes or wishes. I shall quote his own words, and he is now in England to vouch for their correctness.

"Dysentery is certainly a disease of the utmost importance in this climate, (West Indies) and may perhaps be connected with other complaints, which we might not have the most distant suspicion of.* Out of eighty well-marked cases, three have died. The first was an old man, who had two violent attacks previous to the last, or fatal one. The second was a very fine young man, who had scarcely ever been free from the complaint since we left England. The third died of the

* From conversations with him on this subject many years ago, in India, I know he alludes to the functions of the liver.

primary attack, which was accompanied with a much greater degree of fever than usual. In this *last* case, I deviated in some measure from my usual plan of cure, in consequence of calomel not standing high in the estimation of some medical gentlemen on this station. Confiding, therefore, more in the use of occasional purgatives and opiates, with diaphoretics, my patient died. From much experience in this disease, I may with confidence assert, that I scarcely remember to have lost a patient in primary attacks, or where the constitution was not cut down by climate and repeated attacks, when mercury [calomel] was given freely, so as to open the bowels, and bring on ptyalism." *See also what is said by my friend Dr. Archib. Robertson on this subject, in the section on Endemic of New Orleans.*

I have only to add, that since my return to Europe, I have never met with a case of dysentery, where I had the treatment, from the beginning, in my own hands, that did not give way to mercury and its auxiliaries before alluded to, and generally with more facility than between the tropics. —In many cases of chronic dysentery, too, which I have met with among French prisoners and others, the practice, with some slight modification, principally in the *quantity* of the chief remedy, has succeeded beyond my expectation, where the degree of emaciation, and the extent of local derangement, had rendered the prospect of a cure almost hopeless. A reference to numerous communications in the periodical journals of late, and particularly to the valuable work of Dr. Armstrong on Typhus, will shew how much the mercurial practice is preferred to others in dysentery.

Hitherto, I have only presented the favourable side of the picture to view; it now becomes a duty to exhibit its sad reverse! In doing this, however, I have the consolation of hoping that, sooner or later, it may induce those in whose hands alone the remedy is placed, to apply it efficaciously. I may add, that the *rationale* which I have attempted of the disease, is equally elucidatory of the failure as of the success, in the *methodus medendi* recommended.

Those, then, who have had most experience in hot climates, best know the melancholy fact, that in every repetition of dysentery, and after every successive year of our residence between the tropics, we find the remedy has greater and greater difficulty in conquering the disease. In process of time, as the intervals between attacks become curtailed, we find it a very tedious process to bring the mouth affected with mercury; and, what is still worse, the check thus given to the complaint

is only temporary; for soon after the influence of the medicine wears off, our patient returns upon our hands as bad as ever. At length the system absolutely refuses all impregnation from mercury; and we have the mortification to see our patient waste away, and die, for want of the only remedy that possibly could arrest the hand of death—CHANGE OF CLIMATE!

And how can it be otherwise, upon the principle which I have stated? The perspiratory and biliary vessels become gradually weakened, by their inordinate and irregular action, from the stimulus of atmospherical heat: they are consequently more and more easily struck torpid by the least atmospherical viscissitudes, and require the additional stimulus—or rather, the change of stimulus from medicine, to excite their healthy action. Hence, the longer we ring those changes, the nearer we approach that state when the vessels, at last, cease to obey all stimuli—the functions alluded to cannot be restored, and the unhappy victim dies! Add to this, that the intestines themselves become more irritable by every subsequent attack, and, even without any attack, by the impaired state of the functions in question, which annually increases.

This view of the subject leads me to deplore the great waste of human life occasioned, in ships of war, by protracted stations in the East and West Indies! The notion that *time* seasons us against all other diseases, as well as yellow fever, cannot now be urged, for its fallacy is detected. From the great endemic scourge we might, in general, protect our seamen, by proper care; but over the disposition to dysentery and ulcers, in that class of Europeans, we have little control, since time itself is our adversary—*omnia metit tempus!*

I shall now advert to some more minute particulars in the treatment of this complaint, which, from the documents I have produced, and my own testimony, will, I trust, no longer be viewed in the terrific habiliments wherewith it is clothed by Dr. Mosely.

The use of opium in dysentery has been loudly applauded, and as unconditionally condemned. Yet here, as in many other instances, it is the *abuse* only which has brought odium on a valuable medicine. Opium will do harm, if given alone; particularly in primary attacks, and in young or plethoric habits. If alternated with purgatives, it will do little good—perhaps even harm. But if combined with calomel and antimonial powder, it will be found a most important auxiliary

to these medicines, both by preventing any intestinal irritation from the one, and by increasing the diaphoretic effect of the other. All its injurious consequences (if any such result in this way) may be easily obviated by the lancet and laxatives, when symptoms require them.

The nitrous acid I have often found a useful adjuvant, particularly in secondary attacks, where the relaxed and weakened state of the bowels seemed to keep up the disease. A couple of drachms per diem, in barley or cungee water, will diffuse an agreeable sensation of warmth through the alimentary canal, and increase the tone of the intestines.

An infusion of quassia, or other light bitter, should be immediately commenced on leaving off the mercury, and continued till the stomach and bowels have recovered their vigour. This should never be omitted.

It is hardly necessary to remark, after the principles which I have laid down, that flannel next the skin is indispensible, and that the most scrupulous attention in avoiding dews, damp night air, or sudden atmospherical vicissitudes, is necessary during convalescence, to prevent a relapse.

In no disease is patience, on the part of the sick, a greater virtue, or more calculated to forward the good effects of medicine, than in dysentery. If obedience be paid to every call of nature, the straining which ensues is highly detrimental, and I am convinced, augments, in many cases, the discharge of blood—every motion of the body, indeed, increases the desire to evacuate. As little or nothing, except mucus and blood, comes away in four efforts out of five, we should endeavour to stifle the inclination to stool; and (as I know by personal experience) we shall often succeed; for the tormina go off in a few minutes, and by those means we elude not only the straining, but the painful tenesmus, which continues so long after every fruitless attempt at evacuation. This circumstance, though apparently of a trifling nature, is of considerable importance; and yet it has seldom been attended to, either by authors or practitioners. It has the sanction of antiquity, however, as may be seen in the following precept of Celsus—" Et cum *in omni fluore ventris*, tum in hoc precipue necessarium est, non quoties libet desidere, sed quoties necesse est; ut *hæc ipsa mora* in consuetudinem ferendi oneris intestina deducat."—*lib. iv. xvi.*

In the *chronic dysenteries*, which so perplex us after returning from tropical climates, all those precautions and directions detailed under the head of *Chronic Hepatitis*, (with which

the complaint in question is generally associated) will be found well worthy of attention—particularly flannels and occasional opiates.

The diet in dysentery must of course be of the most unirritating and farinaceous nature; such as sago, arrow root, rice,&c. A very excellent dish for chronic dysenteries, is flour and milk, well boiled together, which, with a very little sugar and spice, is highly relished by the debilitated patient.

But there is one remark applicable to this, and every febrile complaint, whatever may be the organ most affected; namely, that, when convalescence takes place, the appetite too often outstrips the digestion, and so do chylification and sanguification exceed the various excretions, so as to occasion a dangerous inequilibrium between assimilation and secretion; the consequence of which is, that the weakest viscus, or that which has suffered most during the previous illness, becomes overpowered, and relapse ensues! This is the great error of inexperience, and it is generally seen too late!—I appeal to clinical observation for the truth and the importance of these remarks.

Cholera Morbus, and Mort de Chien.

Sec. XI.—In no disease has a *symptom* passed for a *cause*, with more currency and less doubt, than in Cholera. From Hippocrates to Celsus, and from Celsus to Saunders, *bile* has been condemned, without a hearing, as the original perpetrator of all the mischief. "Bilis sursum ac deorsum effusiones," says the first; "Bilis supra, infraque erumpit," says the second; and, "Cholera Morbus," says the last of these authors, "may very properly be considered under the head of those diseases which *depend* on the *increased secretion* of bile." *On the Liver, p.* 179. Yet I venture to affirm, that Cholera does *not* "depend" on an increase, but on a diminution, and, in many cases, a total suppression of the biliary secretion.

A very excellent description of the disease in question, as it appears in this country, will be found under its proper head, in Rees's new Cyclopedia, written, I believe, by Dr. Bateman, and taken principally from Sydenham. I shall extract the following passage for my text: "The attack of this complaint

is generally sudden. The bowels are seized with griping pains, and the stools, which are at first *thin and watery*, as in common diarrhœa, are passed frequently. The stomach is seized with sickness, discharges its contents, and rejects what is swallowed. In the *course of a few hours*, the matter vomited, as well as that which is discharged by stool, appears to be *pure bile*, and passes off both ways, in considerable quantities. The griping pains of the intestines now become more severe, in consequence of the extraordinary irritation of the passing bile, which excites them to partial and irregular spasmodic contractions. These spasms are often communicated to the abdominal muscles, and to the muscles of the lower extremities. The stomach is also affected with considerable pain, and a sense of great heat, in consequence of the same irritation. There is usually great thirst, and sometimes a severe head-ach, from the sympathy of the head with the stomach. The pulse becomes *small and frequent*, and the heat of the skin is increased. A great degree of debility, languor, and faintness, amounting even to syncope, speedily comes on; sometimes attended with colliquative sweats, coldness of the extremities, 'and such like symptoms' says Sydenham, 'as frighten the bye-standers, and kill the patient in twenty-four hours.'"

Now it does appear somewhat curious to me, that if an increased secretion of bile were the *cause* of the disease, we should see nothing of it till—"a few hours" after the *effects* become obvious! Where is the increased secretion all the time? Not in the stomach, for it "discharges its contents, and rejects what is swallowed" long before. It is not in the intestines, for the stools are at first "thin and watery." At length, however, "*pure bile*" makes its appearance; and lo! it is accused of being the *cause* of all!

At what season does this commonly take place? In August and September. Certainly that is the time for great heat and increased action in the hepatic system. But are there no particular attendant circumstances? Yes, says the author of the foregoing passage, "It has been remarked, that both in hot climates, and in the hot seasons of mild climates, *occasional falls of rain* have been particularly *followed* by an epidemic cholera."—*ib.* Indeed! a fall of rain is wonderfully well adapted to *increase* the secretion of bile! But again: "In some places it is probable, that the heat of the season may give only *a pre-disposition*, and that certain *ingesta*, *sudden changes of temperature*, or other causes, in this state readily

excite the disease."—*ib.* All these are admirably adapted, no doubt, to produce a great flow of bile! But let us return to Dr. Saunders, who has already informed us, that Cholera "depends on the increased secretion of bile." He says, "it frequently takes place spontaneously, and independently of any *sensible* occasional cause. At other times, it is *evidently* connected with a sudden *change of temperature* in the atmosphere during those months (August and September) or brought on by drinking *cold* liquors, or by any thing else that *suddenly chills the body*, especially when *overheated* by exercise or labour."—*p.* 181. Now, in what manner we are to connect these "evident" causes with an "increased secretion of bile," Dr. Saunders leaves us to find out as we can, for he has not even attempted an explanation. But, in truth, to set about proving that *cold* increased the hepatic action, would have been inconsistent, after what he previously advanced respecting the operation of *heat* on the biliary system.

Having shewn, I think satisfactorily, the inadequacy of these doctrines to an elucidation of the phenomena, I shall proceed to prove, that an "increased secretion of bile," so far from being the *cause* of Cholera Morbus, is, upon the whole, *a favourable symptom*; and that, in the very worst forms of the disease, it is *entirely absent*.

In no part of the globe does this terrific disorder assume a more concentrated state than on the coasts of Ceylon, especially its eastern side. The mountains tower to a great height, in fantastic shapes, or conical peaks, clothed from base to summit with almost impenetrable forests of lofty trees, underwood, and jungle. Deep vallies and ravines, still more thickly covered with similar materials, and choaked up, as it were, with all the wild exuberance of tropical vegetation, seperate the mountains from each other, and swarm with myriads of animals and reptiles. From these vallies, in the months of May, June, and July, when the S. W. monsoon is in force, the gusts of land-wind come down, hot and sultry by day, but chilling cold and damp by night. Where mountainous and woody, or flat, marshy, and jungly tracts, border on the sea, atmospherical vicissitudes will, *ceteris paribus*, be greater, than where the coast is flat and gravelly, or dry and cultivated. The reason is obvious. Thus, the vicinity of Madras, for instance, being a sandy or gravelly soil, which, during the intense heat of the day, acquires a temperature, perhaps 60 or 70 degrees above that of the contiguous ocean, a considerable share of the night elapses before the heat of

the earth sinks to an equilibrium with that of the water; and consequently, we seldom have the land-wind cold there, except after falls of rain; and on the contrary, in May and June, it is hot throughout the night. At Ceylon, on the other hand, the surface of the ground being so defended from the sun's rays by woods and jungles, it never acquires any thing like the temperature of the opposite Coromandel coast; and although during the months alluded to, when the south-west monsoon passes with great strength over Ceylon, the wind by day be hot and sultry, yet, as soon as the dews have fallen in the evening, and evaporation commences from a very extended surface, the land-breeze is instantly rendered cold and raw; and being then loaded with vapour, together with all kinds of terrestrial and vegetable exhalations, communicates to our feelings and frames a chill, far exceeding what the thermometer would actually indicate. The same remark applies to Bombay; but in Bengal there are no regular sea and land breezes; consequently the changes of temperature are not so abrupt and extensive as in the fore-mentioned places.

Numerous cases, exhibiting the dire effects of these atmospherical vicissitudes, aggravated, no doubt, by the land-wind effluvia, now lie before me—effects, indeed, that might well "frighten the bye-standers," or even Sydenham himself; for the patient is often cut off in a much shorter space of time than "twenty-four hours!"

A seaman on board a ship, lying in Back-Bay, Trincomallee, in the month of June, went to bed rather intoxicated. About midnight, however, he turned out, in a state of perspiration, and got upon deck, as is very usual, where he lay down in the cold land-wind, and fell fast asleep. During the preceding day, the land-wind had been hot and sultry, the thermometer ranging from 86 to 88 degrees. In the night, the mercury fell to 74°, with raw, damp gusts from the shore. About four o'clock in the morning, he awoke with a shiver, and left the deck; but was soon seized with frequent purging and griping, his stools consisting of mucus and slime. Nausea and retching succeeded; nothing being ejected but phlegm, and the contents of the stomach. His pulse was now small, quick, and contracted—his skin dry, but not hot. About eight o'clock in the morning, he began to feel spasms in different parts of his body, which soon attacked the abdominal muscles, and threw him into great pain. During these paroxysms, a cold, clammy sweat, would be occasionally forced

out, especially on the face and breast. The extremities now became cold, his features shrunk—the stomach rejecting every thing that was offered, either as medicine or drink. The abdomen and epigastrium, all this time, were distended and tense, with incessant watery purging and painful tenesmus. By ten o'clock, his pulse could scarcely be felt—his breathing was oppressed and laborious—his eyes sunk, and the whole countenance singularly expressive of internal agony and distress! The extremities were cold, shrivelled, and covered with clammy sweats. The violence of the spasms now began to relax; and by eleven o'clock, or seven hours from the attack, death released him from his sufferings! The warm bath, opium, æther, and various medicines had been tried, without affording any relief.

This may serve as a specimen of the worst form of that dreadful disease, which has obtained the appellation of—"*Mort de Chien*," or the "Death of a Dog." No bilious accumulations are to be seen, either in their stools, or what is ejected by vomiting, from the beginning to the end of the disease. Neither is there ever the slightest appearance of '*natural and healthy perspiration*.' A watery fluid is occasionally forced out by the spasms and pain, while the skin is shrivelled and tense, and the sub-cutaneous, or perspiratory vessels, perfectly torpid.

From such an awful state of concentration, the disease assumes all degrees of violence, down to a common Cholera. In exact proportion as bile appears, and the nearer it approaches to a natural quality, so much the less is the danger.

A seaman, from like imprudent exposure to the cold land-winds, after great fatigue during the heat of the preceding day, was attacked with symptoms nearly similar to the former. After the spasms came on, however, he had cold and hot fits alternately, with corresponding sweats, and bile appeared occasionally, both by vomit and stool. He had swallowed a scruple of calomel, and in this case, blood was taken from the arm, which instantly alleviated the spasms. In an hour after the calomel was taken, a purgative enema brought off several copious alvine evacuations, followed by large quantities of bile, some of which was highly fetid and depraved. He now felt greatly relieved—fell into a fine perspiration and sleep, and by the next day was perfectly well.

I could here adduce numerous cases, both favourable and fatal, and little differing, in essential symptoms, from the two related above. But as the point which I have pledged

myself to prove, must be decided by unequivocal and disinterested evidence, I shall bring forward the testimony of Mr. Curtis, a most faithful and candid reciter of facts, as every page in his volume evinces.

It is necessary to recollect, that the disease which Mr. Curtis describes, and the place where it happened [Trincomallee] are those alluded to in Dr. Paisley's letter, where the latter affirms, and I think with justice, that *Mort de Chien* is nothing more than the highest degree of Cholera Morbus.

"Early in the morning of the 21st June," says Mr. Curtis, "we had two men seized with the *Mort de Chien*, both of whom we lost in a few hours; and in the course of the two following days, three more in the same complaint, without meeting with one fortunate case. To the 25th, when we sailed for Negapatam, we had three new cases of the same kind, all of whom were saved, but two of them with great difficulty. Besides these, we had several others, which were of a nature considerably different; *being evidently combined with bilious colluvies in the first passages*, a circumstance *not at all discoverable* in the five cases that ended fatally. All these [viz. where bile appeared] were found to be much more tractable—easily removed, and attended with little danger." —p. 48. "In all of them [the eight cases alluded to] the disease began with a *watery purging*, attended with some tenesmus, but little or no griping. This *always* came on some time in the night, or early towards morning, and continued some time before any spasms were felt." * * * * * "This purging soon brought on great weakness, coldness of the extremities, and a remarkable paleness, sinking, and lividness of the whole countenance. Some at this period had nausea, and retching to vomit, but brought up *nothing bilious*. In a short time, the spasms began to affect the muscles of the thighs, abdomen, and thorax; and lastly, they passed to those of the arms, hands, and fingers."—p. 49. "The patients complained much of the pain of these cramps.——As the disease proceeded, the countenance became more pale, wan, and dejected. The eyes became sunk——The pulse became more feeble, and sometimes sank as much, as not to be felt at the wrist."—p. 50. "The tongue was generally white, and more or less furred towards the root, with thirst, and desire for cold drink." . . . . "The coldness of the extremities, which was perceptible from the first, continued to increase, and spread over the

whole body, but with *no moisture on the skin*, till the severity of the pain and spasms *forced out* a clammy sweat, which soon became profuse."—p. 51. "All this time, the purging continued frequent, and exhibited nothing but a *thin watery matter, or mucus.* In many, the stomach became at last so irritable, that nothing could be got to rest upon it, every thing that was drank was spouted up immediately. The countenance and extremities became livid—the pulsations of the heart more quick and feeble—the breathing laborious. In fine, the whole powers of life fell under such a great and speedy collapse, as to be soon beyond the reach of recovery. In this progression, the patient remained from three to five or six hours, from the accession of the spasms, seldom longer."—p. 52. "In the Seahorse, it attacked some remarkably robust, powerful, and muscular men, who had been in *perfect health immediately before.* Neither, in all our class of *bad and fatal cases*, did there appear any marks of *bilious* colluvies, either in the colour of the *ejected matter* —the state of the abdomen, or the appearance of the tongue, eyes, and urine."—p. 56. . . . . "We had, indeed, another set of cases, where the presence of this [bile] was distinguishable by *all these characters*, but *these* were of a far *slighter* nature, and *none* of them turned out any way untractable or fatal. And again, at Madras, Mr. Curtis observes—"Out of about twenty under my care, a *third* were evidently connected with *bilious* colluvies; and in *these* there was no great sinking of the pulse, or diminution of the heat, and the spasms were confined to the legs and feet." —p. 69. These all recovered. Lastly, in two cases of dissection which took place immediately after death in this disease, Mr. Curtis affirms that—"there were *no bilious accumulations* found any where, and the internal organs were all in a sound state; only there was more water than natural in the pericardium, and the vessels of the lungs, liver, and mesentery, appeared to be very *turgid, and full of blood.*"—p. 72.

I appeal to every unbiassed mind—nay, to prejudice itself, whether I have not now proved (I had almost said to a demonstration) the truth of that heterodox position with which I set out—namely, that "an *increased secretion of bile,*" so far from being the *cause* of Cholera Morbus, is, upon the whole, a *favourable symptom;* and that in the very worst cases of the disease, (Mort de Chien, for instance) it is *entirely absent.*

This point being settled, the application of that principle, to which I have so often adverted—*the connexion* or *sympathy between the functions of the skin and liver*, will afford a more rational explanation of the phenomena, than either "an increased secretion," or a lurking, putrid accumulation of that far-famed mischief-maker—BILE.

The sudden and powerful check to perspiration—the unparalleled atony of the extreme vessels, debilitated by previous excess of action, and now struck utterly torpid, by the cold, raw, damp, nocturnal land-winds, loaded with vegeto-aqueous vapour, and abounding with terrestrial and jungly exhalations—break at once, and with violence, the balance of the circulation. The extreme vessels of the hepatic system, sympathising with those on the surface, completely arrest the reflux of blood from the portal, cœliac, and mesenteric circles; hence, in the worst cases, a *total* suppression of biliary secretion, with distension of the abdomen, and shrinking of all external parts. If this continue any time, as in *Mort de Chien*, death must be the inevitable consequence, notwithstanding the unavailing efforts which Nature makes, by vomiting, to determine to the surface—restore the equilibrium of the blood and of excitability, and, with them, the functions of perspiration and biliary secretion. In proportion, then, as the two latter appear, will the danger be lessened—our most salutary objects attained, and the disease become "less untractable and fatal."

The deluges of bile which occasionally burst forth on the *re-commencement* of secretion in Cholera, are the natural *consequences* of the great plethora in the portal and other abdominal circles of vessels, which took place during the previous check to biliary secretion, and free passage of blood through the liver. And thus we see, that the very *last* link in the chain of *effects* and that too, a *salutary* one, has, for ages, been set down as the *cause* of Cholera—"increased secretion of bile!!"

With respect to the spasms, as they are totally unaccounted for by my predecessors, neither am I bound to dive into the mysteries of the nervous system, for a solution of the phenomenon. I think I have pretty clearly proved, that they are not attributable to bile; since, in the most dangerous and fatal cases, no bile is to be found. I can easily conceive that the brain must suffer, from the broken balance of circulation, as well as from its known sympathies with the stomach and liver, and thus, in some measure, account for the unequal distribu-

tion of nervous energy, which may excite cramps, and throw various classes of muscles into convulsive agitations. I am the more disposed to this opinion, from the circumstance, that in three desperate cases of *Mort de Chien*, the spasms were instantaneously relieved by venesection. In one of them which happened on board the Centurion, *trismus* (an unusual symptom) had taken place—the eys were fixed, and the pupils dilated. Bleeding was attended with immediate good effects, and the patient was well next day.

Having mentioned trismus, I may here remark, that *Mort de Chien* must not be confounded with that or tetanus. For although the latter have arisen from checked perspiration in many instances, they are totally different from the disease under consideration. The gastric irritability, and dysenteric purging, might be a sufficient diagnosis; but the spasms themselves are dissimilar. In *Mort de Chien*, the affection is not confined to a particular class of muscles; it passes from one to another, and those of the neck, face, and back, are almost always exempted. Neither is it a *rigidity*, but a fixed *cramp* in the belly of the muscle, which, as Mr. Curtis justly observes, "is gathered up into a hard knot with excruciating pain" Lastly, the vascular system is infinitely more affected in *Mort de Chien* than in tetanus, and the fatal termination, beyond all comparison, more rapid.

Nor is this investigation of the *proximate cause* of Cholera, a subject of mere curiosity; it is highly useful; inasmuch as it strongly confirms and elucidates the principle which I have kept in view through various diseases in this essay; and what is of more consequence, it points directly to the most indispensible part of the cure, in the awful and terrific forms which the disease assumes in these parts of the world—namely *the early restoration of balance in the circulation and excitability;* an indication but little dreamt of in the old *bilious theory*, where every eye was kept fixed on the lurking demon —BILE!

"In strong habits," says Dr. Paisley, "when the pulse keeps up, evacuations should be promoted both ways, by a vomit of two or three grains of *emetic tartar*."—*Curtis p.* 86 But soon after, he observes, "In relaxed habits, where the pulse sinks suddenly, and brings on immediate danger, the *same method must be pursued*, but with greater caution. The emetics and purges must be gentle, and made cordial with wine, and sp. lavend. Laudanum must be at hand, *to gain time;* and though it is a *dangerous* expedient to *suspend eva-*

cuations where putrid bile lurks, yet, of two evils, the least is to be chosen; for the patient must sink to death, if a respite from evacuations, pain, and spasm, is not procured." Nothing so true as this last. Nature is here, as it were, stunned with the blow; and the struggling efforts which she makes to relieve herself, by vomiting, &c. only exhaust her the sooner, if not effectually assisted by art. We must therefore have recourse to more powerful means than wine, laudanum, or lavender. The warm bath—cordials of the most stimulating kind, such as warm punch, or toddy, must be added to opium and calomel, together with friction, hot flannels, &c. In short, every means must be tried to determine to the surface, restore the equilibrium of the circulation and excitability, and with them natural perspiration (not the clammy fluid forced out by pain and spasm, but a mild, warm sweat) and biliary secretion. Calomel must never be omitted, because it answers a triple purpose:—it allays the inordinate gastric irritability—it excites the action of the liver—and it corrects the constipating effects of the opium; so that, when the orgasm is over, some gentle laxative medicine may, with it, carry off the diseased secretions, which must sooner or later take place, if reaction can be brought on, or recovery effected. When all medicines by the mouth have been ineffectual, in allaying the orgasm of the stomach and bowels, laudanum, by way of injection, has succeeded, and should be had recourse to, though it is generally neglected. I have not mentioned venesection, though, from its instantaneous good effects in three desperate cases, I am inclined to think it might prove a powerful auxiliary in relieving the brain, and other internal organs, when overwhelmed with blood, even anterior to re-action; and also by moderating the violence of the re-action itself. This idea is strengthened by the success which has lately attended depletion in various forms of *spasmodic diseases*, and by the following extract of a letter from my able friend Mr. Sheppard:

Extract of a Letter received by the Author from Mr. J. B. Sheppard, *Surgeon, of Witney.*

"Your account of Dr. Moulson's paper brings to my recollection a practice somewhat analagous (though with a different intention) which I pursued during a short service in the Brazils, a few years since, in the violent form of cholera which seems to be endemic there. You have, I believe, described a similar disease, in India, under the name of *Mort*

de Chien, in which you recommend bleeding with other remedies ; but I have now reference only to the notes which I made of your book, and therefore am not positive. In more than forty cases which came under my care, during the four months we were in the harbour of Rio Janeiro, and on the coast, I found bleeding to *Syncope* instantly and uniformly successful *alone*. There was no critical biliary discharge, but the disease was removed before the arm was secured, and no subsequent medicine was required. The intestinal spasm was far more violent than any I had ever witnessed in the West Indies, (where the disease is pretty severe) and bore a strong resemblance to the convulsive paroxysm ; so much so, that I was generally called to patients said to be in fits ; and the powers of several men were required to restrain them. The first cases I treated by warmth, frictions, volatiles, and opium, but did no good until I adopted the plan I have mentioned, which, in no instance disappointed me; the variations of temperature in that climate are extraordinarily great, frequent, and sudden : and to such mutations the prevalence of intestinal spasms may be ascribed."*

"I had heard much," says Mr. Curtis, "of latent and lurking bile, as the general source of India diseases, and resolved to seek for and hunt it out, by the means employed by others—viz. repeated small doses of sal. glaub. in aq. menthæ piper. sharpened with a very small proportion of emetic tartar. This plan was accordingly tried with our next patient He threw up a *very small quantity* of greenish coloured bile, and the solution operated much downwards, without any relief or discharge of bilious matter."—p 59. After the warm bath, opium, and mulled wine, had been tried without success, Mr. Curtis continues.—"A warm, purgative glyster was given him, but was followed by *no bilious discharge*. No vomiting continued after the first exhibition of the purgative, but a repetition of it, to see if *any bile lurked still in the stomach*, and could be solicited downwards, brought on continued retching, and he threw up every thing after this till his death."—ib. Mr. Curtis now gave up the pursuit of "lurking bile," and saved his next two patients by the warm bath —frictions with hot arrac—wrapping them up in blankets, and supplying them with warm tea and arrac, till perspiration broke out, when they were relieved, and soon recovered.

* Mr. Sheppard will see a striking elucidation of this subject in a case of hydrophobia, by Mr. Webster, related in the Medico Chirurgical Journal. Dr. Sanders of Edinburgh, has long been investigating these points of pathology, and will, we hope, soon lay the results of his labours before the public.

It is only necessary to remark, in conclusion, that in the milder cases of *Mort de Chien*, corresponding to common *Cholera Morbus*, when the bilious vomiting and purging appear, Nature has then repelled the original cause of the disease, and is fast advancing with the cure. We have only now to moderate and regulate her hurried, and, as it were, frightened movements, by opium and calomel, in pretty large doses; the former, as I have before hinted, in glyster; and when all is quiet, to carry downwards, by mild laxatives, the *effects* of the disorder, and its cure—DISEASED SECRETIONS OF BILE.

BERIBERI.

[FROM DR. CHRISTIE's REPORT.]

SEC. XII.—The *Beriberi* is a disease of a peculiar nature, which has been extremely frequent, and fatal amongst all the troops, both *Europeans* and natives in Ceylon. In the milder cases of this disease, the patients are first attacked with some stiffness of the legs and thighs, and this is succeeded by numbness and œdema, sometimes paralysis of the lower extremities.

In the course of a few days, if not prevented by medicine, these symptoms are succeeded by swelling of the whole body, attended with a sense of fulness of the belly, and more particularly with weight and oppression at the præcordia; dyspnœa, starting in the sleep, and all the usual symptoms of hydrothorax. In the latter stage, the dyspnœa and anxiety become extreme, the uneasiness at the epigastrium increases, attended with almost constant vomiting, and occasionally spasms of different muscles: the pulse becomes very feeble, the lips and countenance livid, and the extremities cold.

Some fever, with delirium, often now accede, and terminate the life of the unfortunate sufferer. In the more sudden and severe instances, the patients, from the first, complain of universal debility and extreme oppression, anxiety and dyspnœa. In some of these instances, the progress of the disease is so rapid, that it carries off the patient in six, twelve, twenty-four, or thirty-six hours, after its first attack: more frequently, however, its duration is for several weeks.

In a few cases, where the disease was no less fatal, there was not any swelling observable externally; but the patient

with the other symptoms, had evidently the bloated leucophlegmatic face of a dropsical person.

Upon dissection of different subjects, who had died of this disease, more or less water was found in one or all the cavities of the chest; most commonly in the pericardium, but in general, more inconsiderable than might have been expected from the violence of the symptoms. The cellular substance surrounding the heart was, in some instances, loaded with water; and the heart seemed, in two or three cases, of an uncommon size. In one instance, in which the progress of the disease had been very rapid, I found a large coagulum of lymph in the right auricle. The cellular substance of the lungs was, in many cases, loaded with water. In a few cases, also, there was water effused in the cellular substance on the surface of the brain; and, in one instance, more than an ounce of water was collected in the ventricles. In most cases, water was found in the abdomen, and cellular membrane throughout the body; and, in many subjects, there was a remarkable obesity, even after a long continuance of the disease, and of the use of mercury, antimony, and other powerful medicines. Men of every constitution are occasionally attacked with the *Beriberi*, but the aged and debauched seem to be most liable to it; and men who have once had the complaint, are the most subject to it in future. I have remarked that a very great proportion of the patients, seized with this disease, were men who were accustomed to lead a sedentary and debauched life, such as taylors, shoemakers, &c. who, when working at their trade, are often excused the duty of the field, and, by their double earnings are enabled to procure a larger quantity of spirits than the other men.

I have never met with an instance of this complaint in a woman, an officer, or a boy, under 20; although persons of every description seem equally liable to the other diseases of the place, such as fever, flux, or liver complaint.

It would appear that a stay for some months on the station, is almost essential for the production of the disease; and that the greatest predisposition to it exists, when troops have been about eight or twelve months in the settlement.

The 72d regiment and Coast artillery landed here in July 1795. The *Beriberi* was with them most prevalent in the autumn of 1796; but they had little of it in March 1797, when it was extremely frequent with the 1st battalion *European* infantry, who had arrived here in August 1796.

The 80th regiment relieved the 72d in March 1797, but suffered little from the disease till the November following. The Honourable Company's *Malay* corps arrived here, from *Jaffnapatnam*, in June 1797; but the complaint did not appear amongst them till the January following, when it became very frequent and fatal. Two hundred drafts joined the 80th at *Trincomallee*, on the 3d of January 1798; but none of these men had the disease in January, February, or March although it was then very frequent with the other men of the regiment: since that time, however, these drafts have been at least as subject to it as the other men.

Various modes of cure have been attempted in this disease: but I have of late uniformly pursued the following plan with uncommon success.

In the more mild cases, the patients are immediately put upon a course of calomel and squills. The perspiration and other evacuations are promoted by saline drinks, or small doses of antimonial, or James's powder; and the strength supported by cordial liquors, most generally gin punch, which assists much the effect of the squills.

By these medicines, the symptoms are very often removed in the course of a few days; except the numbness of the extremities, which generally remains longer than the rest. Pediluvium and stimulant liniments are then ordered to the extremities, and the patients are put upon a tonic plan, of bark and wine, or porter, which is continued for some time after all the symptoms have disappeared. In the more severe cases, where the dyspnœa, vomiting, spasms, or other symptoms are violent, it is necessary to apply blisters to the breast, to make use of fomentations, and the hot bath, and to exhibit the strongest cordials, and antispasmodics, as brandy, and particularly laudanum and vitriolic æther. By these means I have, in most instances, been enabled to relieve the dyspnœa, and other urgent symptoms; and procure time for the exhibition of the medicines mentioned above, which it is sometimes necessary to use for several weeks.—*Christie's Report, &c.*

THE DRACUNCULUS, OR GUINEA WORM.

SEC. XIII.—Although this worm attacks most parts of the body, it shews a preference to the lower extremities, particularly the feet and ankles, where it is painful and dange-

rous in proportion as the parts are thinly covered with flesh. It is difficult to extract it from the tarsus and metatarsus—sometimes impossible from the toes. The consequences are often, tedious suppurations—contractions of the tendons—diseases of the joints—Gangrene. When the worm is pulled, the pain is sometimes excruciating as the animal would appear to attach itself to the nerves, ligaments, and tendons. The track of the worm seems to be in the cellular membrane, rarely deeper. There are seldom any premonitory symptoms. The presence of the disease is usually announced by itching, redness, and heat in the skin of the part, succeeded by a vesicle, with some swelling and inflammation. Under the vesicle, which contains a white, thick mucus, the head of the worm may be generally discovered; but sometimes not till several days after the ulceration. Occasionally a small ulcer is the first thing observed; at other times, tumour of the whole limb, with much inflammation. The worm sometimes appears like a hair, several inches long, and becomes thicker as it is extracted; but it generally has a sharp point, and is all of the same thickness. It may often be felt and traced by the fingers, like the string of a violin, under the skin, where it excites no very sensible uneasiness, till the skin is perforated by the animal.

When removed from the body it exhibits no appearance of life, even when extracted at one operation. In length, it varies from 18 inches to six feet. It is elastic, white, transparent, and contains a gelatinous substance.

When the disease is seated in parts that are tender—when there is extensive ulceration—or where the constitution is irritable, there is generally some fever, loss of appetite, debility, and evening exacerbation, especially if the worm happen to be drawn too tight. Swellings of the inguinal glands are sometimes sympathetically induced when the complaint is situated in the lower extremities.

Various have been the opinions respecting the generation of this insect. Both ancients and moderns have attributed its production to the drinking of putrid stagnant waters containing the ova of the worm. Some have regarded the worm as produced from ova deposited in the skin by insects. This last supposition is by far the most probable, notwithstanding the ingenious arguments brought forward by Dr. Chisholm, in favour of the aqueous generation, and for the following reasons:—1st. The disease most frequently attacks those parts of the body that are exposed to wet, as the feet and legs.

Thus the Bheesties or water carriers in India, who carry the water in leather bags on their backs, are observed to be much afflicted with Guinea worm in those parts that come in contact with the mushuk or bag.—2d. It prevails in wet seasons, and damp situations more than in dry.

Many causes, however, may contribute to the production of the disease, as confinement, heat, want of cleanliness in person and habitation, &c. and the means of prevention are founded on these premises, viz. cleanliness—avoiding dampness—keeping the feet and legs covered, [which few European soldiers and sailors, attend to in tropical climates] bathing in the sea, in preference to lakes and rivers—and avoiding contact with those infected; for there is great reason to believe that the disease is propagated by contagion when once produced by other causes.

Methodus Medendi.—Mercury, carried to the length of impregnation of the system,* has been considered by some as a specific, and so has assafœtida in Guinea worm; but the local means are those most to be depended on. *Sublata causa, tollitur effectus.*

When an inflammatory tumour ushers in the disease, leeches, cataplasms, fomentations, and other antiphlogistic measures are to be pursued, till suppuration occurs, and the head of the worm becomes apparent. It should then be seized by the forceps, and pulled very gently and gradually until there be a little resistance, and the worm becomes moderately tight. The extraction is often facilitated by friction with warm oil, and well adjusted pressure in the line of the worm towards the wound. When as much of the animal has been drawn out as the resistance and pain will admit, the end of it should be secured by a ligature or thread passed round it; the thread should then be tied to a piece of small bougee, twisted lint, or small quill, an inch and a half in length, and, with the slack part of the worm, is to be rolled up until it be moderately tight, taking care that it be not on the stretch, as it will occasion fever, or endanger the breaking of the worm. A piece of adhesive plaster is necessary to retain it in its place, and poultices may be continued, especially where there is tumour, to promote a discharge and the expulsion of the worm.

In general, the extraction should only be attempted once in the twenty-four hours. Sometimes a foot of worm can

* Vide Chisholm in Edin. Journal, vol. 11.

be extracted at once, sometimes not an inch. When the whole is drawn out, the sore may be treated as a common ulcer, making moderate pressure on the original track of the worm.

When by injudicious extraction the animal is broken, then tumour, fever, and tedious suppuration in that or other parts are the frequent consequences. Here recourse must again be had to fomentations and cataplasms, until the ruptured end of the worm can be again discovered, and laid hold of.

When the worm can be distinctly felt by the fingers under the skin, before breaking through, it is advisable to extract it by means of a small incision made over the part where it is most superficial, and, as near as possible, over its middle. A ligature should then be applied, and the worm extracted double, in the manner before mentioned.—*Bruce.*

Mediterranean.

General Observations on the Climate.

Sec. I.—When we cast an eye along the beautiful shores of this great inland ocean, and survey the classic scenes which present themselves at every step—when we recollect that in peace or in war, the British flag, commercial or belligerent, waves in every port, and off every promontory, from the pillars of Hercules to the shores of the Hellespont, we cannot but acknowledge that the medical topography—the Endemic—and the contagious diseases of this quarter of the globe are not less interesting to Britons than those of either the Eastern or Western Hemisphere. The more intimately we become acquainted with the various climates of the earth we inhabit, the more we shall be convinced that the "balance of comfort" is not so unequally poised as some querulous philosophers imagine. The Eastern world has its *Hepatitis*—the Western its *causus*—the Northern shores of the Mediterranean have their "*pestilential fevers*"—the Southern and Eastern are annually desolated by the *plague!* If "Happy England" knows not these but by report, or in their sequelæ, she every year sacrifices nearly *sixty thousand* of her inhabitants at the altar of *Phthisis!*

In exploring this interesting track, the labours of many must he united in *analytical* concentration; and it is upon this plan, hitherto unattempted, that I hope to condense into one focus, a stronger body of light on MEDITERRANEAN DISEASES than has ever yet been collected through a single medium.

Before entering on localities, however, it may not be improper to make a few general observations on this extensive inlet.

Placed between the burning sands of Africa on one side, and the Alps and Pyrenees on the other, the Mediterranean

skies are alternately parched by the South-east—Chilled by the North-west, or stifled by the sirocco winds. Thus from Barcelona to Genoa, the iron-bound Coast presents a succession of dreary mountains and craggy rocks, the tops of the *former* being frequently covered with snow, from the beginning of March till the end of May. From these the frigid Euroclydons descend in whirlwinds upon the contiguous ocean; while at other times, the sirocco breathes fire from the desarts of Sahara and Lybia. During the continuance of this wind, all nature appears to languish; vegetation withers and dies—the beasts of the field droop; while those who are strongly susceptible to electrical changes in the air, such as precede and attend a thunder storm, will easily understand the effects of the sirocco on the human frame, as an increased degree of the sensations which they then experience. The animal spirits seem too much exhausted to admit of the least bodily exertion, and the spring and elasticity of the air, appear to be lost. The heat exceeds that of the most fervid weather in Spain or Malta. This accession of temperature is rapid—almost instantaneous; and the whole atmosphere feels as if inflamed. The pores of the skin seem at once opened, and all the fibres relaxed. It sometimes blows for several days together, at a medium heat of 112°. depressing the spirits, and so suspending the powers of digestion, that people who venture to eat a hearty supper are generally found dead next morning. Fortunately for animated nature it is commonly succeeded by the Tramontane or north wind, which, in a short time, restores the exhausted powers of animal and vegetable life.

After this description, the Mediterranean climate could hardly be set down as one that was favourable to the lungs of a Northern invalid seeking refuge from the atmospherical vicissitudes of England. Yet numerous writers describe this portion of the globe as enjoying a happy medium between intertropical heat and hyperborean cold. But we must not calculate on heat, cold, or evenness of temperature by the parallel of latitude; on the contrary, as a modern author has justly observed, "storms most tremendous occasionally burst from the mountains, with the most piercing coldness, on many of the boasted retreats along the Northern shores of the Mediterranean." But from words we shall proceed to facts. The following table shews the *comparative* receipt of pulmonic and other diseases into the hospitals of Minorca,

Malta, and Gibraltar, from the Mediterranean fleet, during the years 1810—11—12, from official returns :

Diseases.	Malta.	Gibraltar.	Minorca.	Total
	1810--11--12	1810--11--12	1810--11--12	
Phthisis Pulmonalis	149	187	119	455
Pulmonic Inflammation	52	51	37	140
Fever	747	138	357	1242
Dysentery	36	79	60	175
Total Phthisis and Pneumonia	202	238	156	596
Other Complaints	883	217	417	1517

Ratio of Pulmonic to the other great complaints, 1 to 2½.

The foregoing table shews only the comparative receipts into hospital of the grand divisions of disease. The rate of mortality is quite another thing. Out of 455 cases of Phthisis alone, 151 died before the remainder could be shipped off for England, where, in all probability, most of them perished! Whereas out of 1242 cases of fever, only 58 died, and a very small number were invalided. This authentic document will speak volumes on the climate of the Mediterranean. In no other possible way could so fair a calculation be made, as to the *relative* prevalence of complaints, as in a fleet, where the crews of ships are subjected to a similarity of regimen, occupation, cloathing, and discipline unknown in civil life, or even in the best regulated army.

That the abrupt vicissitudes of the climate under consideration were extremely productive of pulmonary consumption, the government, and the medical officers of our fleets and hospitals have long been aware; but in private practice, this is little known; and many valuable lives are annually sacrificed by the very means designed to prolong their range.

An ingenious little Thesis has lately been written in latin by Dr. Sinclair, formerly a surgeon in the Royal Navy, on the Mediterranean Phthisis, from which I shall translate and condense a few passages.

Symptoms.—Dr. S. divides the disease into two stages, the inflammatory and suppurative. The first often advances on the patient with insidious pace, and without giving much alarm :*—frequently with symptoms of catarrh, or slight pleurisy, as rigors, heats and chills alternately—thirst—cough—fever. By degrees these symptoms become more marked, and attended with lassitude—pains in the back, loins, and limbs. To these are occasionally added, nausea, vomiting, head-ach, &c. The pulse is generally from the beginning, quick, hard, and full—sometimes the contrary. Acute pains, more or less severe, now shoot in between the sixth and seventh ribs near the sternum. Sometimes this pain is complained of as deep under the breast bone—quite through to the spine—or stretching to the clavicles, or shoulder bones, with difficulty of breathing. These symptoms will often become suddenly increased, with such oppression about the præcordia, and obstruction of the vital functions as lead to suspicion of inflammation of the heart itself or its coverings. The patient is now harrassed with a dry, irritating cough—dyspnœa, and inability to lie down. These symptoms are somewhat mitigated on the appearance of expectoration, which is rarely free, or tinged with blood. In some people, who are biliously inclined, the pain in the right hypochondrium will imitate Hepatitis, till purulent expectoration reveals the true nature of the disease.

The termination is either by resolution—suppuration with ulceration of the worst kind—or effusion.

Resolution.—In this case, the graver symptoms subside before the close of the first septenary period—that is, about the seventh day, the pain ceases—the pulse becomes slow—the expectoration free, whitish, and thick—the skin relaxes into a gentle perspiration—the thirst is assuaged—and the appetite returns. If these salutary events do not take place before the fourteenth day, suppuration is generally the consequence.

Suppuration.—In many cases, although the violence of the disease is mitigated by appropriate remedies; yet a deep-seated, obtuse pain continues obstinately fixed in one side,

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* Dr. Burnett while speaking of pneumonia in the Mediterranean, observes that—"He wishes to caution the practitioner against the *insidious form of the* "*milder attack of this disease*, which is but too often considered of little mo- "ment—*as a catarrh*—and the cure entrusted to small doses of antimony and "a great coat—often to nature. With pain has he witnessed the effects of this "treatment in the *melancholy increase of consumptive cases*, which the summer's "heat has brought before him."—*Preface to 1st Edition.*

with a sense of weight there. The difficulty of breathing remains, and the patient cannot lie down. Debility now increases fast—emaciation takes place—the pulse is easily accelerated—the expectoration from being viscid and frothy, becomes, in a few weeks, opake, yellow, or green. In short, hectic fever is established, and PHTHISIS carries the victim to his grave in the course of five or six months—generally towards the latter end of August or September.*

Post Mortem appearances.—Vomicæ of various dimensions were very often developed. The larger contained from a few ounces to a pint of fœtid, green or yellow pus. In some cases empyema—in others, the lungs were ulcerated—beset with tubercles of different sizes, or entirely destroyed, with only a mass of tubercles remaining—and that too within six weeks after the stage of acute inflammation!

Methodus Medendi.—During the inflammatory period, nothing but the most decisive evacuations from the vascular system will save the structure of the lungs from that dreadful disorganization described above, and which supervenes on inflammation in the lungs in a more rapid manner, here, than in any other climate. Twenty-four or thirty ounces of blood must be immediately abstracted, and this reiterated according to the violence of the disease. Saline cathartics—cool air—cool drink—rigid abstinence—antimonials—blisters, &c. are to be used as secondary means. In these cases, it is not always easy to limit the extent of ulterior venesection. If we bleed *too* far, we risk effusion—if *too* little, suppuration.

Felix qui potuit medium cognoscere tutum.

This is a most critical and dangerous period of the disease. About the fourth or fifth day, we shall apparently have conquered all the more violent symptoms, and the patient will be considered convalescent—but all at once, he is seized with darting pains in the chest—the muscles of respiration are spasmed—and strangulation is threatened by the convulsive cough! Blood must again be drawn, but with caution, for the transition from this state to irremediable effusion is awfully sudden and uncertain. Here local evacuations, and other local means may be beneficially put in requisition.

When PHTHISIS approaches, nothing but a retreat from the Mediterranean before the autumn sets in, can give a shadow of hope or safety to the patient—

Frustra per autumnos nocentem
Corporibus metuemus Austrum, *Hor.*

* Autumnus tabidis malus. Hippoc.

as has been proved by the *recovery of many invalids*, when sent home, in the Autumn, from our fleet. "Non alio modo "evitari possunt, quam Cœlum salubriori mutando; quod *in-* "*validi plurimi domum* e classe nostra, in autumno quotannis "remissi, sanescendo, confirmant." *Thesis, p.* 30.

Dr. Sinclair remarks that as in the months of *January and February*, the air is clear, temperate, and steady in the Mediterranean, they are the only months in which a *phthisical* invalid can safely sojourn on the shores, or navigate the waters of this inland ocean.

MEDITERRANEAN FEVER.

Analytical Review of Dr. BURNETT'S *Work on the Bilious Remittent Fever of the Mediterranean.*

SEC. II.—If the destructive war, which ravaged the world for more than twenty years, has consigned millions to an early grave, it has, like most human events, been productive of good as well as evil. In a medical point of view it has called forth original genius, in combating the maladies to which we are subjected by our emigration or military enterprizes; and we are much mistaken, if it has not thrown great light on a disease, the nature of which has puzzled the physicians and philosophers of all ages. The awful forms which FEVER assumes in fleets and armies beneath the burning skies of the East and West Indies, and round the romantic shores of the Mediterranean, gave rise to bold and energetic measures of cure, which never could have originated in the retired paths of private practice. A cursory view of our military and naval medical writings, must clearly evince the truth of this remark. But these innovations were regarded with a dubious eye by our medical brethren at home; and although the host of prejudices, engendered in the humoral, spasmodic, and Brunonian Schools are now fast dispersing, it is necessary to give every new *fact*, illustrative of a more rational theory and successful practice, the widest publicity, since the phantoms of "debility and putrescency" continue still to haunt the minds of a very considerable portion of medical practitioners.

The first part of this volume proposes to give "a faithful and practical account of the disease, as it appeared in the ships and hospitals of the Mediterranean fleet."—*Preface.*

Dr. B. states that, excepting in one instance, the ships of the fleet enjoyed an exemption from fever during the spring months, and early part of the summer, the disease occurring in its epidemic state, either while the ship was in port refitting, or shortly afterwards. The exception was in H. M. S. *Kent,* where the disease broke out while cruising off Toulon, *three months* after leaving Harbour. It is towards the end of June, or beginning of July, that febrile affections present themselves; and the usual symptoms are head-ache, nausea, prostration of strength, suffused eyes, flushed countenance, tongue white and moist, thirst, skin variable, both as to temperature and perspiration. The same may be said of the pulse; but the bowels are generally costive, and the appetite impaired. These are the milder symptoms of the disease in summer; but where the patient has committed excesses, or been exposed to the sun and night dews, it frequently assumes a severer aspect, resembling the autumnal fever of hot countries. At this time, gastric symptoms are seldom formidable, the head being the organ which principally labours; the relief of which, and intestinal evacuations, are the paramount objects of the practitioner's care.

As the summer advances, the disease is more dangerous. After a sense of lassitude and prostration of strength, a chilliness extending along the spine succeeds; and this is followed by considerable vascular action, accompanied by head-ache, deep-seated pain in the orbits, with sometimes a prominence of the eye-balls, which appear watery, inflamed, and impatient of the light. A flushing, and even tumefaction of the face, extending down towards the breast, are not unusual, with loaded tongue and bad taste in the mouth. Amongst the usual symptoms may also be enumerated, uneasiness in the epigastric region, nausea, bilious vomiting, pains in the joints and back, and constipation. The pulse is generally full and hard, sometimes oppressed, but rises under the lancet.—Partial perspirations are sometimes observable; but generally the skin is dry, and the temperature increased. Severe rigors sometimes, but not very commonly, precede the hot stage of the disease. In many cases, the disease makes a sudden impression, the patient dropping down in a state of insensibility, while at his usual work. In these cases, re-

action soon takes place, with violent determination to the brain.

"During the *winter months*," says Dr. B. "the morbid affection of the brain is not, at all times, so prominent a symptom."—p. 6.

We have seen *intermittents*, and irregular remittents, the consequence of obstructed viscera, occur at this season; bnt if vegeto-animal miasmata be the cause of "the bilious remittent," when aided by atmospherical heat, the winter is assuredly an unusual time for such a disease.

Dr. Burnett very justly remarks, that if the fever is not early combated, or if treated as a typhoid affection, the appearances will be very different. The head-ache will be accompanied by stupor, and an indifference to surrounding objects; the eyes will have a duller look than usual, or have a yellow tinge spreading, more or less, rapidly to the neck and body. The tongue will be covered with a thick yellow coat, while it is brown and dry in the middle. The prostration will be considerable; the anxiety and pain in the limbs great; the uneasiness in the epigastric region will be urgent, with bilious vomiting and harrassing singultus.

"In the severe attacks," says he, "about the third day, there is often an appearance of complete remission, but the evening puts an end to the delusion; an exacerbation takes place, with great increase of all the dangerous symptoms. Unhappily, this deceitful period has often been mistaken for a real remission of the symptoms, and tonics and stimulants have been given, with a view to prevent the recurrence of the paroxysm; but vain, indeed, are all such efforts, they serve but to increase the malady.—p. 8. "As the disease advances, the pain and uneasiness about the *epigastric region* continue to increase; there is constant vomiting; considerable pain upon pressure, with restlessness and oppression at the procordia. The abdomen is likewise painful, with frequently thin, black, fœtid, and sometimes gelatinous-like stools. The suffusion, at first of a bright yellow, now assumes a darker hue," &c.—p. 9.

The symptoms which precede death in this fever, are pretty similar to those observable in the fevers of hotter countries, such as coffee-coloured vomiting, intolerable uneasiness in the epigastric region, hæmorrhages, subsultus tendinum, floccitatio, black encrusted tongue and teeth, sinking of the pulse, cold extremities, and finally death,

which terminates the scene—"frequently on the third or fourth, but generally from the fifth to the eight day; though sometimes, death is protracted beyond that period."—p. 10. Dr. Burnett, contrary to the observations of Cleghorn, asserts, that "in by far the greater number of cases, though there are evening exacerbations, there is but seldom any evident and clear remission in the morning."

Under the head of "probable causes," Dr. Burnett traces the influence of marsh miasmata in the fevers which prevail at Minorca, Malta, &c. with many interesting and sensible remarks on the topography of those places. Dr. B. reiterates the sentiments of former writers on the *exciting* causes of this fever, namely, intemperance, exposure to the sun by day, and the dews by night. The young and plethoric are most subject to the disease, particularly the crews of boats, and ships' companies, who have shared much prize-money, and are permitted to spend it on shore.—p. 17.

Our author has not been able to detect the agency of contagion in its production, but rationally, we are sure, allows that "in the latter stages of this fever, where proper attention may not have been paid to personal cleanliness, to the removal of the excretions, and to ventilation, where the sick are crowded, the surrounding atmosphere may be vitiated."—ib.

Method of Cure.—Dr. Burnett judiciously enough divides the disease into four stages. 1st. From the beginning till the commencement of gastric symptoms or yellow suffusion, a period of about three days. 2d. From this period till the appearance of nervous symptoms, the duration of which is various. 3d. From the accession of these last symptoms, marked by increased uneasiness in the epigastrium, ischuria, singultus, coffee-coloured vomiting, &c. till death or convalescence. 4th. From the commencement of convalescence till final recovery.

Our author but too truly observes, that in the first stage of the disease, the prostration of strength, watery eyes, anxiety, syncope on the abstraction of blood, &c. are well calculated to deceive the inexperienced observer.

"Blood-letting, both general and local, should be had recourse to, and repeated, according to the urgency of the symptoms: the benefit derived will be greatly increased by the use of purgatives and free ventilation. It will often happen, after a few ounces of blood have flowed, that syncope will be induced; this must not prevent the repetition of the bleeding, while the symptoms require it."—p. 20.

Dr. B. in imitation of Dr. Irvine, prefers arteriotomy at the temples.

"In the course of an hour, the bleeding may generally be repeated, and thirty or forty ounces may be taken away without producing syncope. In bleeding, the patient should be laid in a horizontal position."—ib.

The purgatives which Dr. Burnett recommends, are those of Dr. Rush, namely, calomel and jalap. He justly remarks, that the oppressed pulse will rise under the lancet, and that an accession of strength is actually obtained by the loss of blood.

"The great object, says Dr. Burnett, is the removal of the local affection of the brain, or other organ, and the production of a complete remission of the febrile symptoms in the least possible time. In one instance, I ordered blood to be taken from the temporal artery, to the amount of ninety ounces in the course of six hours; he was convalescent in three days." p. 22.

If, notwithstanding all our efforts, the febrile symptoms should continue, Dr. B. recommends in the evening, after a repetition, if necessary, of the bleeding, a pill composed of calomel and antimonial powder, each two grains, followed by a dose of julep. ammon. acetat. with cool drink, and the most strict antiphlogistic regimen.

In a note at page 34, Dr. B. states, that "it is but justice that I should add, that *some surgeons* thought benefit was derived from the use of calomel in the *first stage*, carried so far as to excite ptyalism."

After recommending decisive evacuations from the vascular system and the bowels, during the whole of the first stage, but condemning emetics, Dr. B. proceeds to the second stage, premising, that much confidence must not be placed in cold and tepid affusions, excepting as auxiliaries to the above measures.

In the second stage, he thinks, that where the symptoms indicate the necessity of venesection, it may still be resorted to, though in smaller quantities, and the blood is best drawn from the temporal artery. Blisters to the head, and daily evacuations from the bowels are here proper; but the cathartics should be of the less powerful kind, such as castor oil, assisted by enemas. The irritability of the stomach is to be allayed by the application of leeches, and the exhibition of saline draughts, in a state of effervescence, to which may be added, *small* doses of tinct. opii. The application of a large blister to the stomach has also been attended with success.

In this stage, Dr. B. speaks highly of the warm bath, and we entirely coincide with him.

In the third stage, "little more can be done than to look on, and endeavour to obviate occasional symptoms as they occur." p. 29. As the pulse sinks, the stimuli must be increased; and Dr. B. thinks, that he has seen much benefit from carbonate of ammonia and aromatic confection, in this dangerous stage of the disease. We must take care, however, while we labour to restore the balance of the circulation, not to induce a state of secondary excitement, and thus exhaust the flame we were endeavouring to keep alive. Even here, constant attention must be paid to the bowels, and daily evacuations procured. Dr. B. asserts, that the disease has seldom terminated in intermittent, under his own treatment; but frequently under that of others.

"It appeared to be in general, occasioned by some morbid affection of the *brain*, liver, or other viscera."—p. 31.

In these cases, he recommends mercurials till the mouth becomes affected. In the fourth or convalescent stage, the only interesting remark relates to the care we should take, in guarding against a relapse from repletion. While noticing the different remedies which have, in their day, been celebrated in this fever, Dr. B. asserts of cinchona, that, "under its use, mortality has been great, relapse frequent, and, as in the cases of the Temeraire and Invincible, dysentery attacked nearly all the patients who had had fever in a severe form; nor was there an instance, that when given during a supposed remission of the symptoms, it prevented a return of the paroxysms."—p. 34.

On dissection, the vessels of the brain were generally found distended, and even gorged with blood, while the membranes were inflamed, and the ventricles containing serous effusions. In the thorax, the lungs and other parts were inflamed. In the abdomen, liver generally enlarged, frequently livid towards the lower edge of its concave side. Gall bladder moderately full of inspissated bile. Stomach generally, more or less inflamed, as also the intestines.—p. 37 et seq.

The cases and dissections occupy more than eighty pages of the first part of our Author's work. They more than prove the grand object of Dr. Burnett, and of many judicious writers, who have laid the result of their experience before the public; namely, that the lancet must be boldly used in those fevers, and in those climates, where the dogmas of the schools, and the timidity of practitioners, had nearly proscribed

it. In this point of view, the accumulation of facts, will firmly support the rising edifice of a more rational and successful mode of treatment than has formerly been employed, and Dr. Burnett's work therefore, entitles him to the thanks and esteem of the public.

The second part of the work opens with a sketch of the Author's observations and practice in the Mediterranean, while serving on board the Goliath, Diadem, Athenienne, and finally, as physician to the fleet. In the year 1799, a part of the Goliath's crew, that been employed in watering the ship at Marsa Scala, in the Island of Malta, suffered an attack of bilious remittent fever, the prominent symptoms of which were, nausea, vomiting, head-ache, flushed face, full and frequent pulse, thirst, white tongue, and, and in most cases, delirium.

"The patients were liberally evacuated on their complaining, and the bleeding repeated according to the urgency of the symptoms; an open state of the bowels was preserved, and a mild diaphoresis kept up. Blisters were applied to the nape of the neck and forehead, and a strict antiphlogistic regimen pursued. This soon produced a cessation of the pyrexia, when tonics and a well-regulated diet completed the cure." p. 132.

In the succeeding year, forty of the Diadem's crew were similarly affected at Port Mahon, "and so speedily was a remission procured by the free use of the lancet, that I had only occasion to send two or three to the hospital." p. 133. Dr. B. here acknowledges that the use of emetics in a few of the first cases was highly prejudicial, a fact that will be experienced in the fevers of most warm climates. In this fever, small doses of calomel and antimonial powder were given with advantage, after liberal evacuations; and a simultaneous application of cold water to the head, and warm water to the lower extremities, was productive of beneficial effects, a circumstance that accords with our own experience in fevers of a similar type. In one case which proved fatal, Dr. Burnett's assistant gave the patient an emetic of tartarized antimony, the consequence of which was, that "the vomiting increased, and never afterward for a moment left him; he passed blood by the nose, mouth, and anus, and finally died at the hospital." p. 134.

Let this prove a lesson against emetics in fevers of the warmer regions, where gastric irritability is one of the most formidable symptoms we have to encounter.

The Athenienne's ship's company having been much exposed to the ardour of a summer sun at Malta, while the vessel was docking and refitting there, was attacked with fever attended by great local determination, "but," says our Author, "by a proper use of the lancet in the *early stage*, joined to purgatives, they all speedily recovered" p. 135.

Shortly after Dr. Burnett was appointed physician to the fleet, in 1810, a fever broke out in the Achille, of 74 guns, at Cadiz, which was reported to the admiral, "*to be the yellow fever of the West Indies*, and of a very malignant and infectious nature." This caused great alarm in the squadron; but Dr. B. found that the symptoms were similar to those he had observed in the fevers at Mahon, &c. and that there was great determination to the thoracic viscera in particular. "Emetics, bark, camphor, wine, and opium were employed in the treatment of these patients," which our Author very properly ordered to be laid aside, since two deaths had already occurred; and "the lancet was had recourse to and used freely, and also purgatives: this soon produced a change in the features of the disease, and the whole, except one man, speedily recovered." p. 136.

Dr. Burnett arrived at Gibraltar in September, at which time the garrison was healthy. The thermometer ranged from 75 to 80, and about the 18th or 19th, a deluge of rain fell, and continued three days, the torrents from the upper parts of the rock sweeping down great quantities of putrefying vege table and animal substances, which lay stagnant with the water in many places where the outlets were not pervious. After this the weather became very warm with easterly winds. In the last three days of the month 26 men, belonging to the St. Juan guard-ship, were sent to the hospital with the bilious remittent fever, four of whom died, none of which had been bled. The general treatment was purgatives, calomel, blisters to the region of the stomach, and gentle diaphoretics. The cold affusion was also tried, and proved useful.

From Mahon Dr. Burnett proceeded to Sicily, where he found that experience had already pointed out the necessity of evacuations when DEBILITY was the most prominent symptom, as is evinced in the communications from Dr. Ross, of the Warrior, and others. The army practitioners had, indeed, adopted the most decisive depletory measures among the troops in Sicily, previously to this period, as our readers know, from the writings of Irvine and Boyle; but in the navy it was only slowly introduced, and we believe Dr. B.

met with some difficulties, which, however, his zeal surmounted, in banishing from the minds of the medical gentlemen under his control, the phantom *debility*, and the delusive theories of the schools.

There is one circumstance which we have not yet noticed, though it has made a deep impression on our minds, namely, that throughout the descriptions which are given of this "bilious *remittent* fever," by Dr. Burnett and his numerous correspondents, no mention whatever is made of either diurnal or alternate *remissions*; excepting in the Temeraire and Invincible; and we cannot help expressing our suspicion, that a great proportion of the cases were fevers occasioned by atmospherical transitions and irregularities, rather than by the application of vegeto-animal miasmata: and that, consequently, they were attended with more marked inflammatory symptoms, and assumed a less remittent type, than the fevers under whose denomination they are classed. Perhaps the term "bilious fever," (gastric irritability being so very general) would be more proper; and where the cause can be clearly traced to the operation of marsh miasmata, the epithet "remittent" might be properly added, because it is rare indeed that remissions on alternate days in particular, cannot be distinctly perceived. We have offered these suggestions because we are of opinion that some modification of the practice detailed by our author, is necessary in the more fatal endemics of the warmer climates, where that wonderful and powerful morbific cause—"marsh miasma," attains a state of concentration unknown in Northern latitudes. In the Temeraire and Invincible, where the fever was evidently the bilious remittent of hot climates, the treatment was founded on the directions of Lind, Clark, and Balfour, whose works continue still to produce incalculable mischief in the hands of inexperienced practitioners. But the more rational and successful doctrines and practices which have lately been promulgated by judicious medical men, both in the army and navy, will dissipate, ere long, the mists of prejudice, and annually save the lives of thousands of our countrymen. We have only to read the melancholy account of the fever in the two ships above-mentioned, to be convinced of these truths.

"On making enquiry, says Dr. B. as to the method of treatment which had been pursued with those men, I found it to have been by the use of *emetics*, calomel, antimony, *bark and wine in large quantities*, with full meals of animal food from the beginning."—p. 158.

We hardly know how a surgeon could prescribe, or a patient take, "full meals of animal food," in a violent and and acute fever, where all appetite is almost invariably destroyed. But the medicines were quite sufficient to produce the fatal catastrophe which followed. Those who did not fall immediate sacrifices, "were constantly relapsing; several as frequently as three times, most of them once, and some of them were daily attacked with dysentery." p. 159.—This was not all; for the visceral derangements induced by these protracted and repeated attacks incapacitated them in great numbers for the service of their country, and left them to drag out a miserable existence in indigence and disease! Such are the fruits of adhering to Brunonian theories, and the doctrines of debility and putrescency, taught with such complacency and importance "in academic bowers and learned halls."

We have hinted that certain modifications of the treatment pursued by our author, would be necessary in the bilious remittent fevers of warmer climates, and the reason is obvious; although in the Mediterranean, the range of the thermometer equals at certain seasons the scale of tropical temperature, yet there is not that perennial ardor which, in equatorial regions, keeps the functions of the liver in so deranged a state as to render that organ peculiarly predisposed to disease, when the balance of the circulation is violently disturbed, as in remittent and intermittent fevers. On this account, liberal evacuations in the early stages of Mediterranean fevers, and slight tonics or bitters afterwards, are in general sufficient to conduct to a happy termination: whereas, in other and hotter regions, particularly in India, the use of *mercury*, in addition to the means alluded to, is absolutely requisite to secure the biliary organs from obstruction or abscess.

"In the Repulse," says Dr. B. "Mr. Boyd reports that he had been very successful in combating it, [the fever] by the early use of the lancet and purgatives; cold and tepid affusion he likewise found serviceable, as auxiliaries. In some cases, copious and sudden affusion produced a diminution of febrile heat, sweats, and a remission. In *several* of the patients, he mentions *calomel* as having had *very excellent effects*. In one case of *great danger*, benefit appeared to be derived from the inunction of *mercurial ointment* on the epigastric region." p. 149.*

* See Dr. Denmark's Paper on the Mediterranean Fever in the Medico Chirurgical transactions, and Dr. Boyd's Paper on the Minorca Fever in a subsequent section.

We have already stated our doubts respecting the propriety of classing all Mediterranean fevers under the head of "*bilious remittent,*" as our author has done, and our belief that a great many of them occurred totally independent of marsh miasmata. The following extracts will support this opinion. Mr. Allen, surgeon of the hospital at Malta, after describing the general symptoms of a fever which broke out on board the Pomone, and remarking, that "The *head and liver* seemed to be the principal viscera affected in this fever," goes on thus: "The Weazle sloop, refitting at the dock-yard, has also sent us about thirty, with similar symptoms to the Pomone's. Our method of treatment has been, in the first instance, by the abstraction of thirty ounces of blood, the exhibition of a cathartic, and a bolus composed of calomel and antimonial powder, of each two grains, twice a day; the mist. salin. In the evening, the bleeding, if necessary, was repeated. Next day, if the symptoms required it, recourse was again had to abstraction of blood, a blister applied to the epigastric region, and the febrifuge medicines continued. I consider this fever to have been brought on by *intemperance and exposure to heat,* constituting the bilious or yellow fever of the island. It is not contagious." p. 168.

In a subsequent fever, in the Weazle, Mr. Wardlaw, whom our author highly eulogises for his abilities, and whose statement consequently deserves attention, reports thus: "The state of the weather for these six weeks past has been extremely warm; the thermometer ranging from 80 to 87 in the shade. The Weazle arrived at Malta in the month of June, and went up to the dock-yard to refit; the ship's company were then perfectly healthy. Liberty being given to go on shore, and they having received a considerable share of prize-money, intemperance was the consequence; and next day, while very much debilitated, their duty necessarily exposed them to the heat of the sun. On the first attack, I took away immediately from twenty-four to thirty ounces of blood; with saline daughts and cathartics, a bolus of calomel and antimonial powder, of each two grains twice a day, *till the mouth was slightly affected,* generally completed the cure. The *liver and brain* seemed to be the only viscera affected; the liver from obstructed ducts, and the brain from the great determination of blood to it." p. 170.

The remainder of the second part of Dr. Burnett's work is occupied in sketching the fevers of different ships, and stating the reports of their surgeons on the method of treatment, which entirely corresponded with what we have detailed in

the foregoing pages. Bleeding, purging, and the exhibition of mercury were the prominent items in the "*Methodus Medendi*," and will, we are convinced, triumph over the boasted list of stimulant, antiseptic, and febrifuge remedies, so long imposed on the credulity of mankind by the fetters of prejudice, and the bigotry of preconceived theories.

When the gates of Janus shall once more be thrown open, and the scourge of war (which Heaven avert!) be again suspended over the restless nations of the world, the medical officers of our fleets and armies will profit by the labours of the present race; and the bold energetic measures of modern practitioners in the West, in the East, and in the North, will be remembered and imitated, when the authors who practised and promulgated these tenets shall have mouldered in the dust!

GIBRALTAR FEVER.

Sec. III.—When the chastening hand of the Almighty lay heavy on our transatlantic brethren, and their cities exhibited the ravages of a wide wasting pestilence, we all remember the violent disputes and discrepancies of opinion which divided the Medical World, respecting the nature of the disease. It was difficult to conceive how such diametrically opposite tenets could be so enthusiastically embraced, on points which appeared to us capable of being decided by common observation. The matter has now come nearer to us; and we see that on the shores of the Mediterranean, as well as on the shores of America, the same schisms prevail in the medical creeds of those who have been eye witnesses of the dreadful scourges that afflicted Gibraltar, Cadiz, and Carthagena, during the last ten or fifteen years. Where respectable medical testimonies are nearly balanced, it is next to impossible that *either* party can be wrong *in toto*; and therefore it appears wise and just to admit that *both* have some foundation for their opinions. Indeed, it is perhaps more true in these, than in any other instances, that "truth lies between the extremes."

The following most important document, and the succeeding paper of Mr. Humphrey's, will exhibit as clear a view of the medical topography and fever of Gibraltar, as many volumes on the subject.

Answers to Queries relative to the Epidemic at Gibraltar, which were submitted to all the Medical Men in the Garrison by Mr. Fraser, now Deputy Inspector of Hospitals.

By R. Amiel, Esq.

Query No. 1.—*When did you first observe the Epidemic and do you attribute it to foreign introduction, endemic causes, or atmospheric vitiation? State facts in support of your opinion.*

I observed the first case of the malignant fever which has lately prevailed in this garrison, when I visited the Lazaretto on the 19th of August ultimo, having been absent, previous to that period, on account of the bad state of my health. A few cases of the same fever appeared afterwards in different parts of the town, and, by the 10th of September, they became so numerous as to leave no doubt about the existence of the epidemic. I had an opportunity more particularly to observe the origin and progress of that disease in the years 1810 and 1813; and, comparing the result of my observations with the history and cases of the malignant fever which raged here in 1814, I have no hesitation to give it as my opinion, that the epidemics which afflicted the garrison at those different periods are of the same nature, differing only as to the extent of their ravages, and sprang from the same source. I do not attribute it to foreign introduction, and I found my opinion on the following considerations: the rise and progress of our epidemics have never been traced, in a satisfactory manner, from a single point of contagion to a gradual number of individuals or families; and, instead of creeping slowly from one district to another, cases have appeared unconnected, and scattered at different points, and, in some instances, it has spread with the rapidity of the electric fluid, attacking persons who never had approached the sick, nor any assignable source of contagion.

An individual labouring under our epidemical fever, on being removed to a pure air and ventilated place, such as the Neutral Ground, or Europa Point, did not communicate the disease to those in the closest contact with him: this observation has been confirmed in many instances, during the epidemic of last year, amongst the foreign recruits quartered at the Brewery Barracks. The depot consisted of between five and six hundred men, sixty of whom were permanently employed in the different departments in town, or as servants

to officers. Those men, on being attacked by the epidemic (and I believe not one escaped it), generally came to the barracks, where they lay all night in a crowded ward, and sometimes, by concealing themselves, they continued two days in the same place; yet I never observed, that either their breath or the effluvia of their bodies and clothes had proved infectious to their companions. Forty women of that depot, who had been prohibited passing Europa Gate, remained perfectly healthy, although I had seen some of them sitting on the same bed where a man was lying in a fever. Out of the four thousand Spaniards removed last year to the Neutral Ground, a few died of the fever then prevailing in the garrison; but it is a well-known fact, that those only had the fever there, who were already sick on going out, and that they did not communicate the disease to any of their neighbours or attendants. If this disease cannot be transplanted from this to such a small distance, could it have been transplanted thousands of miles from America to Cadiz, and then from Cadiz to Gibraltar? and, if ventilation so effectually destroys the infectious quality of this fever in a place so contiguous to our atmosphere, is it to be believed, that it would have less efficacy on board a vessel, and especially in a boat, where a man or foul clothes must stay some time before they reach our shore?

The epidemics which have appeared at Gibraltar, as well as the epidemics which have raged at Cadiz, Carthagena, Malaga, Alicant, &c. &c. have always appeared about the latter end of the summer, or during the autumnal season. If the epidemic had the faculty of re-producing itself by contact with the sick, or with substances charged with the effluvia of the sick, would that faculty be inert during nine months of the year? and do other importable contagions consult seasons to make their ravages?

The inefficacy of the various means which have been repeatedly employed to stop the progress of the epidemic, such as sending out the sick, shutting up their houses, prohibiting meetings of all kinds, &c. &c. and, on the contrary, the success which has evidently attended the measures of removing to a pure air those who appeared more susceptible of catching the fever, as was done last year with so many thousand inhabitants, and this year with the regiments who were growing sickly, clearly proves, that our epidemical fever is not easily removed from its focus, nor easily exported to another place.

Various cases of this fever have been observed in this garrison, while there prevailed no epidemic, nor any suspicion of an imported disorder; and I mention the two following as worthy of notice: the first has been witnessed by the Deputy Inspector of Hospitals in this place.

Dominic Benedetty, an Italian by birth, a stout man, and of a strong constitution, about 26 years old, was admitted into the hospital of foreign recruits on the 29th of August, 1812. He had been taken ill at two o'clock in the afternoon, at Landport, working at the pump, when he was suddenly attacked by great shiverings, and a severe head-ache, which continues; he vomits yellow and green bile, pulse is quick, skin hot and dry, eyes reddish; complains of severe pains in the back and joints, and has a great anxiety.

30th August. Has passed a very restless night; a great deal tormented by retching and vomiting, sighing continual; countenance depressed.

1st September. Retching continues; any liquid he takes is thrown up instantly. Eyes a little yellow; lies very uneasy in his bed; has great oppression at the pit of the stomach; bowels costive.

2d September. Has passed a very bad night; has been delirious; is now sensible, but rather comatose; retching continues; has vomited a quantity of dark fluid resembling coffee grounds; skin of a natural temperature.

3d September. Skin yellow; has had the hiccough the greatest part of the night, very often vomits a dark fluid, and continues, now and then, with hiccough; urine high coloured and in small quantity.

4th September. Skin is now dark yellow; the patient is sensible, has passed several black stools, vomited only once since last night, hiccough has not returned.

5th September. The patient feels greatly relieved; vomiting and hiccough did not return; pulse quite regular and soft; pain of the stomach relieved; keeps what he drinks; gums are sore, tongue swelled (effects of mercury).

6th September. Has had a few hours of good sleep; continues better; relishes sago and broth.

7th September. Continues better; is convalescent.

James Shootz, admitted into the hospital of foreign recruits, 26th of December, 1812; is a German, full habit, middle-sized stature, about 25 years old; was taken ill on the 24th instant, and remained in town without reporting himself;

the leading symptoms are a violent pain in the head, back, and joints ; skin hot, pulse quick and low, tongue foul, eyes dull, bowels costive ; complains of sickness at his stomach.

28th December. The patient has constant retchings, and vomits a green and yellow bilious-like matter ; pulse continues quick, eyes yellow, and a yellowness about the chest.

30th December. The patient has an hemorrhage from the nose ; pulse about 130, tongue covered with a brown fur, continual tossing, skin dark yellow, urine very scanty ; no vomiting since yesterday.

31st December. Hemorrhage from the nose continues now and then, gums bleed, tongue is quite black, has swallowed a quantity of blood, has passed many black stools in his bed, is delirious, at times lying quietly, at other times attempting to leave his bed, and calling out in excruciating agony ; has not passed any water since yesterday, has the hiccough, and, on the morning of the 1st of January, died.

These two cases of fever, attended with two great characteristics of the prevailing epidemic—viz. yellowness of the skin, and black vomiting, which I selected among many others I observed from time to time, while the garrison was reputed very healthy, indicate, that our epidemical fever has no need of the introduction of a foreign seed, but that it originates spontaneously here, and has, most probably, for its primary and essential cause, putrid exhalations floating in the atmosphere.

Those noxious vapours which arise from any place where the process of putrefaction is going on, either in vegetable or animal matters, are copiously generated in the neighbourhood of marshes, rivers, in the sea-port towns, &c. and have been considered, from the time of Hippocrates, as the most universal cause of diseases. They are most easily produced by the concurrence of heat and moisture ; they are more deleterious in autumn than at any other season of the year ; and it is generally acknowledged, that their degree of concentration chiefly determines the types of the fever which they excite in the human body.

That numerous sources of such exhalations exist in Gibraltar, and that its topographical situation is peculiarly calculated to increase their virulence, may be inferred from the following circumstances.

The population of Gibraltar has greatly exceeded what can be admitted into the confined limits of the town ; an evil which was already sensible in 1804, and has continued until 1813.

The inhabitants being much limited for ground to build upon, have frequently placed the door and windows of the apartments on the same side; and have, by that means, made it impossible to have the air of the rooms sufficiently renewed.

The ground for building being very dear, and house-rent excessively high, cellars and stables have been converted, in many places, into dwelling houses to receive numerous families, without any regard to their health or accommodation; and, in other places, a great number of sheds have been constructed, in such a manner as to preclude access to ventilation, affording, besides, materials for putrefaction, by the decayed state in which they are frequently left.

To overcome the excessive price of house-rent, the poor labouring classes of people have been compelled to crowd themselves in the same apartment, where it is not unusual to see three rows of beds one above the other, while some are lying on the floor, which is in general badly paved, and always damp.

These people, going out early in the morning to procure their livelihood, are in the habit of shutting up the door and windows of the apartment, which are not re-opened until they come home in the evening, when they breathe an air deprived of its oxygen, or loaded with the noxious effluvia of their bedclothes.

It has been acknowledged by the Board of Health, in the proclamation dated August 27, that the first victims of the epidemic have been amongst these classes; and I am convinced, that such a deplorable state of misery has frequently given, among them, a malignant type to a disease which would otherwise have been a simple ephemeral fever; experience having shewn, that, whenever a fever appears in one of the individuals thus circumstanced, it attacks every one of them in succession, and always with increasing danger.

The privies being generally placed very close to inhabited rooms, and on the hill side, having no communication with the sewers, become extremely offensive, especially when nightmen are employed to empty and carry off their contents; and, in the houses where the privies have a communication with the sewers, cess-pools having been established to prevent the drains from being choaked up, without attending to the danger of having the houses or yards undermined by those repositories of corruption.

The slope of the sewers being insufficient, and the largest not more than two feet in width or in height, they are not able

to carry off all the filth which proceeds from this over-crowded population; and we frequently see them burst open in the streets, to the great annoyance of the inhabitants.

Those sewers not being carried on to a sufficient distance into the sea, discharge all the noxious matters on the beach, where they remain, with other putrid substances thrown from the Line Wall, until high spring tides wash them away.

The offal of the slaughter house having been repeatedly allowed to putrefy on the beach, has been an object the more offensive to the public, as the least breeze from the sea blows its effluvia to the very centre of the town.

Fresh water being a scarce and expensive article in this garrison, the poorer classes of inhabitants avail themselves of the opportunity to collect rain-water in pipes, tubs, &c. which they keep in yards frequented by many families, and it is not very uncommon to find there dirty water in the highest state of stench.

The inhabitants have been directed, in many parts of the town, to carry the filth and sweepings of their houses to some places which have been established, to enable the scavenger department to transport them quicker and easier out of the town; but those nuisances have been frequently left in these deposits long enough to acquire a degree of putrescency very noxious to the neighbouring habitations, and unpleasant to those who approach the cart in the act of removing them.

The beach, at the north end of the town, is covered with a quantity of timber of all kinds, and corrupt materials, which must have a pernicious effect on the atmosphere; and the water of the inundation, slowly renewed, covers itself with a green moss, which, sometimes drying on the borders, becomes a nursery of miasmata; and I can assert, from my own observations, that several men of the Foreign Depot, who have been successively employed at the pump in that neighbourhood have been attacked with fevers of a bad type, as is confirmed by the case of Dominic Benedetty.

The temperature of Gibraltar, in the summer months, differs very little from that of the Islands between the tropics, the thermometer rising from 80 to 90 degrees of Fahrenheit; the weather is usually very dry from the beginning of May to the latter end of August; and the town, protected by high walls on the north and south, stands at the western foot of a steep mountain, whose elevation is about 1400 feet, completely obstructing all easterly breezes, and rendering, during their continuance, the atmosphere of this side of the rock

nearly stagnant; and therefore, the exhalations which a scorching sun raises from the many unwholesome substances above enumerated, accumulate from the want of ventilation, and becoming a very powerful cause of diseases, have, most probably, aggravated the bilious remittent fever, which has long been known here in its mild form, to that malignant type which has lately constituted our epidemic. In fact, the summers preceding the epidemics of 1804, 1810, 1813, and this last summer have been chiefly remarkable for a long continuance of easterly winds; it is, consequently, highly probable, that the Epidemic of Gibraltar has a domestic origin, is produced by local causes, and has not been introduced from abroad as a specific contagious disease.

It will be objected, that the Epidemic of Gibraltar is the genuine yellow fever of the West Indies, a disease never observed in Europe before the year 1800, when it appeared at Cadiz, from whence it was transplanted to other sea-port towns on the meridian; that its appearance in Gibraltar in 1804, could not be attributed to local causes, as the place had been always reckoned very healthy previous to that period, but must have been consequently the result of a poison imported here, and propagated by contagion: a fact which becomes the less doubtful, as the very persons who introduced the disease from Malaga and Cadiz, have been traced and pointed out in a very satisfactory manner.—Moreover, the re-appearance of that fever in 1810 and 1813, when it raged at Cadiz and Carthagena, confirms its importation from one or other of those places, as it is difficult to believe, that local causes, which had produced the epidemic in 1804, would have been inert from 1805 to 1809, and more lately, in 1811 and 1812.

In answer to these objections, I will observe, that our epidemic, or yellow fever, is not so new a disease as has been commonly believed, but that it was observed in Minorca by Dr. Cleghorn, in an epidemical form, in the years 1744 and 5;* that it raged in Carthagena, in the year 1785, in Malaga in the year 1786, where three thousand men died in the hospital of San Juan de Dios only, and at Cadiz in the year 1764, where, according to the description of Dr. Lind, it carried off no fewer than a hundred people a day, presenting the great characteristic symptoms of our epidemic, such as black vomiting and yellowness: but this accurate observer never so

* Observations on the Epidemical Diseases of Minorca, from the year 1744 to 1749.

much as hinted at its being an imported contagious disorder; a circumstance which would not have escaped him, if there had been any probability of its having been introduced by contagion. The epidemic did not appear in Gibraltar before the year 1804, because the miasmata arising from those noxious substances which had been suffered to accumulate, had not yet attained that degree of maturity which was required for the production of such a general and malignant disease; but a milder form of it has been long known here, under the denomination of bilious remittent, as is averred by all the medical men acquainted with this place. This fever became frequent in 1803 and in 1804, when it assumed, about the latter end of August, a very aggravated form, the character of bilious remittent being, however, yet perfectly distinct, as was declared by a medical consultation held to report on the nature and progress of the disease. If the fever has not re-appeared from 1805 to 1810, and more lately, in 1811 and 1812, it must be ascribed to that unsteadiness and unaccountable contingency which mark other diseases in their virulence and re-appearance. And, lastly, the arrival in the garrison of one or more persons, ill of this malignant fever, at the first breaking out of the epidemic, does not prove its foreign origin, or its propagation by contagion; for, on the one hand, this fever has broken out in places where there was not the least possibility of foreign introduction; and on the other, a number of people labouring under it have sometimes been landed in other places, without injury to the health of the inhabitants. In support of this fact, I submit the following memoranda:—

"At the commencement of January, 1812, about 460 foreign recruits arrived in this bay from the Spanish coast: part of them were landed in this garrison on the 13th of that month, but they were re-embarked the next day on board the Downs and Langley Transports, to proceed immediately to England. By some accident, the Downs lost the convoy in the night, and came back to this bay, where she lay on the 28th, when I was desired to go on board, as some of the recruits had been taken ill. On my first visit, I found five or six men with a fever, one of them very ill; and I observed, that besides their being in a crowded state, they were in great want of clothes; a circumstance which induced them constantly to stay between decks, in order to avoid the inclemency of the weather. On the 30th of January, the sick, whose number had increased to thirteen, were landed and

brought to the hospital of foreign recruits; and on the 2d of February, 18 more of the same men, who had been taken ill, were likewise landed and sent to the hospital of the 7th R.V.B. in charge of Dr. Lamert: the number of the sick, however, continuing to increase among them, an hospital was established afloat, on board the transport Edward, and I believe, no less than forty of the same men were admitted into it in the course of a very few days. The fever in all those men presented a type more or less continued, was attended with irritability of the stomach, bilious vomiting, yellowness of the skin, &c. &c.; and had, in every symptom, a perfect resemblance to the epidemic which has prevailed in this garrison."

The circumstances which preceded the breaking out of this fever, exclude every suspicion of its having been excited by the introduction of a foreign poison; and its not having spread to the people lying in the same wards with them ashore, proves, that it was not a disease propagated by a specific contagion, but a disease generated in that filthy, crowded, and unventilated vessel—which may serve to establish the fact, that the malignant fever of our epidemic may originate in this warm latitude, in any place where the same circumstances are to be found.

"On the 22d of January, 1813, a vessel from Alicant landed in this garrison thirty-eight recruits and six prisoners: the former were sent to the Depot, and the latter were confined in the Provost. The recruits appeared very healthy on their landing; but the next day, 23d of January, five of them were sent to the hospital with fever. On the 24th, three of the same men were likewise sent to the hospital with fever; on the 25th, two; on the 26th, five; on the 27th, three; and on the 30th, four more:—so that, in the space of twelve days, thirty-four out of the thirty-eight recruits, and three of the six prisoners confined in the Provost, were admitted into the hospital for foreign recruits, with the symptoms of the fever so often prevalent in this garrison, viz. shiverings, severe headache, eyes inflamed and watery; pulse full and quick; pains in the back and joints; irritability of the stomach; bilious vomiting; and, as the fever advanced, a yellow suffusion about the eyes and skin, &c. &c. The fever terminated generally, from the 5th to the 7th day after the attack, by a copious perspiration, leaving the convalescent in a state of great debility, and much exposed to relapses."

Although that fever appeared of a mild nature (probably on account of the cold season of the year), there is ground to

suspect, that it was a fever susceptible of becoming infectious; that is, of acquiring the power of re-producing itself on individuals exposed to its effluvia during a length of time, because two men in the hospital with chronic disorders, one orderly, and the surgeon who attended them, were taken ill of a fever with the same symptoms. Those men had suffered a great deal on board, where they had been twenty-two days in the most stormy season of the year; they came on shore in a most wretched state; they were especially in want of clothes, and the crowded state in which they lay in the hospital, while the heavy rains and bad weather prevented the windows from being opened, was the cause of their fever taking an infectious character. Had they arrived here during the autumnal season, or had the town of Alicant not been very healthy when they embarked, I should have been led to believe, that a fever of a suspicious type had been imported from Alicant into this place; while, from the want of such circumstances, and by a careful investigation, it is evident, that the exciting causes of that fever were the misery and wretchedness of the people on board, the effects of which were on the eve of displaying themselves when they arrived in this garrison.

No. 2.—*What were the diagnostic symptoms at the commencement of the Epidemic?*

The diagnostic symptoms of this epidemic, at its commencement, have been similar to those of the preceding epidemics. The disease in general manifests itself by shiverings, which are succeeded by severe head-ach, chiefly referred to the forehead, and above the orbits; pain in the back and joints; eyes inflamed and watery; skin hot; pulse quick and full; loss of appetite; bowels costive; and, as the disease advances, an oppression at the region of the stomach, which is generally followed by retching and vomiting of a green and yellow bilious-like matter. By the 3d day, the inflammatory appearance of the eyes has been changed into a slight yellowness, which extends to the neck and chest; countenance is depressed; tongue furred with a brown coat, and has a tremulous motion when put out; the pulse is quick and feeble; the uneasiness at the stomach very great; the vomiting, which was green or yellow, takes a darker appearance, which has been, in many instances, not improperly, compared to coffee grounds; urine is high-coloured and scanty. At the latter

end of the 3d day, or at the commencement of the 4th day, there appears a remission of the symptoms; which, in many instances, has deluded those who were not familiar with the insidious progression of that disease; head-ache ceases; pulse, although weak, becomes regular, slower sometimes than natural, and the patient feels easier, and enjoys all his intellectual faculties; but that state is not of long duration:—an exacerbation takes place a few hours after, and brings on an increase of all the dangerous symptoms; the uneasiness at the stomach, which had never ceased completely, increases to a great pain; the abdomen is likewise painful; there is a difficulty of deglutition, with a sense of soreness of the throat; frequent vomiting of a dark matter, which, received in water, precipitates to the bottom; pain across the pubes, and suppression of urine; pulse sinks, and becomes scarcely perceptible; sweats are partial and clammy; gums and tongue turn black; hiccough is harrassing; and subsultus tendinum comes on to terminate that distressing scene on the 4th, or at the commencement of the 5th day.

In some cases, petechiæ appear before death; in others, there is an hæmorrhage from the nose, gums, anus, and even from the eyes. Others have no vomiting; but, in its stead, a diarrhœa of a black fluid, which gives great gripings to the patient, and soon exhausts his strength.

The symptoms above described do not generally appear all together in the same patient, and they do not always proceed with the same rapidity; in many instances, a remission becomes sensible on the 2d day, and the disease is protracted, under the type of remittent fever, to the 7th, sometimes to the 9th, but seldom later than the 11th day.

Such is the course of that dreadful malady in its aggravated form; but fortunately, as it happened in the two last epidemics, the great majority of the cases are milder; and, the fever not attacking with all the severity above described, or being counteracted by the early use of medicines, a diaphoresis appears on the 3d or 5th day, which relieves the anxiety of the patient, and is a favourable omen; pulse becomes softer; vomiting ceases; and, all the febrile symptoms giving way, the patient becomes convalescent on the 5th or 7th day. Although the disease has been of short duration, convalescence in general is protracted, and exposed to relapses, especially when the yellow suffusion has been great.

No. 3.—*In what phenomena do you consider it to assimilate with bilious remittent, or with typhus; and wherein does it differ from those disorders? Where have you witnessed the bilious remittent previous to the Epidemic? Have you witnessed the Epidemic before this season?*

I believe that our epidemic differs only in degree from the bilious remittent fever, and that those two disorders have one and the same origin; they prevail in the same climates; they attack the same organs of the body; they are chiefly fatal to persons of the same constitution; and the form of a mild remittent is often to be seen close to the most malignant type of the epidemic, at the same time, and under equal circumstances of exposure: the symptoms in each seem only to mark gradations of the same disease, and the types, more continued or less remittent, are determined by the difference of seasons, constitutions, and by the greater or less virulence of the exciting causes. Like typhus, our epidemical fever is marked by rigors, diseased sensations, severe erratic pains, particularly of the head and loins; delirium, coma, subsultus tendinum, &c.: and like typhus, the seat of its impression appears to be the brain and the nerves, deriving most probably the peculiar symptom of yellowness, which constitutes its specific character, from the local affection of the viscus more connected with the bilious secretion.

I was in this Garrison in the year 1810, and I had the opportunity of observing the epidemical fever which then made its appearance in this place. Bilious remittents were very prevalent in July and August, especially in the hospital of foreign recruits, of which I had the charge; in the month of September, some cases of that fever appeared likewise in the same hospital, but they were attended with more malignity, and two ended fatally. I was at that time desired, now and then, to visit some inhabitants labouring under a fever presenting the same symptoms, particularly in the neighbourhood of Scud Hill.

On the 20th October, I was called to see Jacinto Reys, a carpenter in the Dock Yard, attacked with fever; he had been working three or four days on board the *San Juan*,* where he was taken ill. The leading symptoms were, severe head-ache; eyes inflamed; dorsal pains; pulse very quick and full; great irritability of the stomach; constant retching;

* See page 138, Burnett's Mediterranean Fever, and Edinburgh Medical Journal for October, 1812.

and vomiting of a bilious-like matter, &c. The disease went through its periods to the 7th day, when a free perspiration brought on a favourable crisis. On the 22d of October, Andrew Reys, an elder brother of the patient, who did not live in the same house, but who had visited him the day before, and had been sitting for some time on his bed, was taken ill with the same leading symptoms; and in the course of three days, the mother, the grandmother, a child, and a person who lived on the same floor, were taken ill of a fever presenting the same symptoms as Jacinto Reys. Andrew Reys died of that fever on the 26th of October, and the rest of the family were sent to perform quarantine on the neutral ground, where the grandmother died.

No new cases appearing in the Garrison, the quarantine was taken off on the 24th of November, and they were allowed to return to their homes. A younger brother, however, named Joseph Reys, 14 years old, who had been very healthy during the time of the quarantine, was, three days after returning to his house, seized with a fever which presented the same symptoms as his brothers', but in a more aggravated form; on the third day, a vomiting of black matter came on, and he died on the fourth day from the attack.—The patient was visited by the greater number of Medical Officers in the Garrison; the family was again sent to the neutral ground, and their furniture burned.

On examining with attention the circumstances of the cases which occurred during the fevers prevailing in this Garrison in that year, it appears to me evident, from the facts which directly came under my knowledge, that atmospheric causes, more or less powerful, according to the different changes of seasons, gradually directed the form of those fevers, from the mild bilious remittent in July and August, to a more aggravated one in September and October, attended with great irritability of the stomach, but with remissions still distinct; and lastly, in November, to that malignant type which brought on dissolution in four days, preceded by black vomiting. The exciting causes of the fever which attacked the whole of the unfortunate family of Reys, must have had the same origin; but those exciting causes were more concentrated, and had acquired greater energy when they actacked Joseph Reys, its last victim.

Bilious remittent fevers were very prevalent during the summer of the year 1803, appearing likewise under a mild type in July and August; but, as the autumn approached, I

observed they were assuming a more aggravated character, and, at the commencement of September, two gardeners died of fever in less than five days, in my neighbourhood, one opposite Cooper's Buildings, and the other near the South Barracks. These two fatal cases of fever, which I know to have been previous to, or contemporary with those in the City Mill Lane, have convinced me, that the circulated report of the epidemic having originated in the latter place, was groundless, as well as its importation from Cadiz; and the history of the epidemic of the year 1810, proves it likewise to be endemical here, and not imported from Carthagena, as had been asserted.

No. 4.—*What was its individual duration, particularly in fatal cases?*

I had no opportunity to observe the individual duration of the late epidemic, except when I had the charge of Dillon's Hospital; the few fatal cases I observed then, took place from the 5th to the 7th day from the attack. With the other sick, a free perspiration appeared from the 3d to the 5th day, which was followed by a remission of all the febrile symptoms, and the patients were convalescent very soon after that crisis. In one case only, the disease was protracted to the 9th day, when a swelling of the parotis appeared; the patient was better on the 10th, and on the 12th day from the first attack he was sent to the camp in a very fair way of recovery.

No. 5.—*What were the mortal symptoms? Did any particular symptoms denote convalescence, or crisis?*

The symptoms, which have more immediately preceded the fatal termination of this fever, have been weakness and irregularity of the mental operations, face flushed, eyes dull and half open, breathing short and laborious, sweats cold and clammy; pulse low, vermicular and intermitting; deglutition difficult, faltering of the speech, passive hemorrhages from different parts, involuntary stools of a black and fetid fluid, effusions under the skin forming petechiæ or vibices, anxiety inexpressible, constant retching and vomiting of a dark matter; tongue, gums, and lips quite black; fetid breath, cadaverous smell of the body; urine high coloured turbid, scanty, and sometimes totally suppressed; hiccough, coma, convulsions, subsultus tendinum, &c.

A concurrence of these symptoms denotes the greatest degree of debility, combined with a putrescent state of the fluids; and death may be announced as fast approaching.

The favourable terminations of this fever have generally taken place on the 3d, 5th, or 7th day from the attack; and have been announced by a copious and free perspiration, which has marked a crisis of the disease; pulse has become soft and regular; and the patient recovering his appetite and sleep, has passed to convalescence.

No. 6—*Have you been able to adopt a general mode of treatment, to which you give the preference? Report especially upon—*

1st. *Bleeding.*—I have bled very seldom during the epidemic; I have found bleeding very successful in the bilious remittent of the summer.

2d. *Purgative Medicine.*—I have constantly made use of purgative medicines at the commencement of the attack, and repeated them occasionally at the different stages of the disease, so as to keep the bowels open.

3d. *Cold affusion, or cold generally.*—I have employed cold air, and very often spongings with cold water, in order to moderate the preternatural heat of the skin, and to check the increased velocity of the circulation.

4th. *Tepid spongings.*—Tepid fomentations have been employed on the abdomen whenever there was any pain, strangury, or diminution of urine; and warm baths have been found very useful in the second stage of the disease, when the pains were severe, and the nervous symptoms attended by great prostration of force.

5th. *Mercury as an alterative.*—I have most generally employed mercury on the first attack, until it produced a small degree of ptyalism; and I employed it in doses corresponding to the degree of fever, with an intention quickly to affect all the system.

6th. *Other remedies*—I had recourse to different remedies to oppose different symptoms, as they appeared most urgent; incessant vomiting has been in general the most distressing of all, and the most difficult to subdue; and, in order to sooth the exquisite irritability of the stomach, I have employed, alternately, fomentations with sulphuric æther on the epigastric region, the application of opium, camphor, and sometimes of a large blister, &c.; and internally the effervescent mixture—columba root, brandy and water, opium

&c.; but repeated clysters with small doses of opium, have been found peculiarly serviceable, and sometimes it has been beneficial for the patient to abstain from any liquid for several hours.

In one instance, the strength of the patient being nearly exhausted, the urine turbid and scanty, I administered, on the recommendation of Dr. Holst, 30 drops of the spirit of turpentine, and I repeated the dose two hours after. I have reason to believe that this medicine was very useful; and the patient recovered.

When the increased action of the system had been overcome, and the remissions were no longer doubtful, which has generally happened on the 4th or 5th day, I endeavoured to obviate the debility by administering bark combined with a mineral acid, at first in decoction and small doses, and, as the stomach recovered its tone, in substance and combined with wine.

No. 7.—*What were the most severe appearances you observed on dissection?*

The most severe appearances I observed on dissection, were gangrenous spots on the internal surface of the stomach, and a quantity of black fluid contained in it; liver enlarged, gall bladder full of a black and viscid bilious matter, &c.—Effusions of lymph between the brain and the pia mater, the ventricles filled with a yellow serum, and a very remarkable distension of the blood vessels in the head of a man who died the third day of his illness. In two men who died with a suppression of urine, a very small quantity of dark turbid fluid was found in the bladder.

No. 8.—*Can you support by cases, or undeniable authority, any instance of a second attack, or relapse? If so, forward the regular statement. Were both attacks of fever, in such instances, decidedly marked, or similar in their progress? Was there a complete remission of all the febrile symptoms, in those called relapses? Were the relapses referable to cold, fatigue, inebriation, or other causes?*

I believe those who have suffered the epidemic once, are generally exempt from a second attack; and the experience acquired during four epidemics in Gibraltar, has established

that opinion as a law in medical science. There are, however, some exceptions; and, besides a few cases I have from good authorities, I lately had myself under my care a man, of the name of Joseph Rumbel, who, from his own statement, and the assertions of his friends, was very ill of the fever in 1804, for which he was sent to the Lazaret: the attack this year has been with the same symptoms of passive hemorrhages, but it has been rather more severe, and the yellow suffusion has remained for some time after his convalescence.

I attended, during the prevalence of the epidemic last year, the wife of Serjeant Tighe, of the 26th regiment, for a disease which I then considered as the prevailing epidemic; she was dangerously ill for eight or ten days, and I have seen her this year attacked with the same leading symptoms of the epidemic; so that as far as I am able to judge, both attacks have been regularly marked.

I have frequently observed relapses of the epidemical fever, after all the morbid symptoms had been overcome, debility excepted; in many instances, I had some reasons to attribute them to an improper conduct of the patient, such as exposing himself to cold, or making use of food unfit for his situation, &c.; but in some instances I have been at a loss to find out a cause to which I could impute such a regression to sickness.

No. 9.—*Did you observe any causes which seem to influence its progress or decline?*

I infer, from my observations, that the epidemic has spread more rapidly during the prevalence of the easterly winds, with a warm and humid atmosphere; and that it has been checked in its progress and frequency by cold, heavy rains, and high westerly breezes.

No. 10.—*Was it contagious or infectious? The reasons for supposing it so or not.*

Our epidemic being produced by local causes, not reaching the people beyond this side of the Rock, cannot correctly be deemed contagious or infectious, but merely a simple, primary, and idiopathical fever taking its type from the energy and concentration of those deleterious causes, which, floating in our atmosphere, uniformly influence a great number of persons, and, under certain circumstances, induce in

them a uniform and general aberration from the healthy state, thus constituting an epidemical disorder. This I believe, is merely the character in which the fever has appeared here during the present and preceding years, at the commencement of the season. The primary causes, however, continuing to operate, the putrid effluvia, arising from febrile bodies under an insalubrious atmosphere, have acquired, in some instances, a contagious or infectious quality; that is to say, the faculty of producing symptoms resembling those which constituted the disease from whence they originated, and of propagating that disease from one body to another, by the laws of *contagion*, which are equally terrible and mysterious.

The transition or aggravation from a simple epidemical fever to a contagious one, has been remarked by many writers. We read, in Dr. Clark's Collection, page 61: "The remittent fever, contracted at unhealthy harbours where ships touch for refreshment, from inattention to cleanliness and ventilation, acquires a high degree of virulence and *contagion*." Dr. Lind on Hot Climates, p. 138: "In the year 1741, no sooner had the rainy season set in at Carthagena, where the English troops lay encamped, than the remittent fever, then remarkably malignant, became also *contagious*, and destroyed the greatest part of the army." Guyton Morveau, in his Traité de moyens de désinfecter l'Air, page 244, says, "La plus terrible des contagions, et en méme temps la plus commune, est celle qui produit le grand nombre des personnes affectées de la même maladie, quels qu'en soient le caractère et l'origine." And Mr. Assaliny, in his work, entitled, Observations sur la Maladie appellée Peste, page 11: "Some epidemic diseases become *contagious* solely from a number of persons being crowded together in one place, and especially in ill-ventilated hospitals."

Relying on such respectable authorities, I am strongly inclined to think, that the endemical fever of this climate appearing now and then under the type of bilious remittent, has attacked in the same manner a multitude of persons exposed to the same atmospheric causes, and has constituted our epidemical disease; *but that disease, epidemical only in the abodes of filth and confined air has acquired, in some circumstances, an infectious property*, which, together with predisposing causes, such as fatigue, intemperance, heat, &c. and above all, the painful apprehension of soon becoming a victim to a scourge which every day cut off so many people

—an apprehension which staggers the most resolute—has increased the malignity of the fever, and rendered it pernicious to the highest degree. The infectious quality, however, being only accidental, has been lost whenever the patient, or his foul clothes, have been transferred to a pure air and ventilated place, as has been confirmed by experience with the people removed to the Neutral Ground, and with the foreign recruits quartered last year at the Brewery Barracks.

My opinion relative to the epidemical fever having, in some instances, acquired an infectious property, is derived from the history of that fever in the Rey's family, which I mentioned before: the circumstance of Andrew Rey's not living in the same place, nor having been exposed to other remote causes to which the rest of the family might have been subject, form a strong presumption that he caught the fever by sitting so long on the bed of his feverish brother. My opinion is derived likewise from my own experience in the hospital of foreign recruits, where three men and myself were taken ill with the fever in consequence of our attending thirty-four men who landed from Alicant, as stated in the preceding pages; and lastly, from the statements of some patients, who have been able to trace the moment and the track of the infection to their own persons, in the manner which has been so well described by Dr. Trotter, in his Medicina Nautica, pages 213 and 214.

No. 11.—*Were other acute diseases observable during the epidemic season?*

I have had under my care different acute diseases, such as catarrhs, pneumonia, dysenteries, &c. during the prevalence of this and of the preceding epidemics.

No. 12.—*Were the symptoms the same at the commencement of the epidemic, as towards the end of the season, particularly in fatal cases?*

I believe the symptoms of the epidemic have been the same from the commencement to the end of the season; but, as far as I have been able to ascertain, they have grown milder since the weather has grown cooler, and I have not heard of late of any cases attended with that intense malignity and rapid dissolution, so frequent in September and October.

No. 13.—*Have you observed the disease particularly arise in any class of individuals in the habit of constant communication with each other? or have you observed it to have been particularly severe in certain tents, guard-rooms, or barracks? If so, report upon them.*

I believe it particularly arises in that class who are exposed to the sun or great fatigue, are reduced to low living, or indulge in drunken excesses. It is particularly severe among those who inhabit ill-ventilated places, and are in the habit of crowding themselves in the same apartment, as is frequently the case with the labouring people of this garrison. When I had charge of the 26th regiment last year, I observed that the soldiers of that regiment, who had been on Rosia guard, were more subject to be taken ill than those who had been in the other guard rooms.

No. 14.—*At what period, after the exposure to exciting causes, did the disease generally manifest itself?*

I cannot give a positive opinion on this Query, as I want experience to ascertain if nature pursues in this a regular course; but from the circumstance of people having been taken ill on the first day of their landing here, and from the information I had, that people who fled from this garrison in 1804 were taken ill on the coast of Portugal many days after they had left this place, I am induced to believe that the disease may be pu into action at any time from the first moment of exposure to a period of fifteen or twenty days.

Such are the answers which my observations and experience enable me to give to the proposed Queries. During four years and a half that I have been in this garrison, I have constantly had the charge of a depot, into which have been gradually admitted near twelve thousand deserters or prisoners from the French army. The wretchedness and hardships those men had undergone on the Spanish coast, predisposed them strongly to diseases, and the opportunity of witnessing among them the types which the fever assumes in this climate has been unfortunately too frequent; and from observations carefully repeated I derive my opinion, that the bilious remittent of the summer, and the epidemic of the autumn, are produced by the same causes more or less concentrated, and acting more or less generally; and that, *although the autumnal fever might have been infectious in some instances,* its

infectious quality may be easily prevented; and it is to the destroying of its primary sources that our wishes and labours must be earnestly directed.

Gibraltar, Nov. 24, 1814. R. AMIEL.

Analysis of Mr. Assistant Surgeon HUMPHREY'S *Paper on the Gibraltar Fever, of* 1813.

[Vide Edinburgh Journal, 1816. p. 178.]

Mr. Humphrey's object, in this communication, is to recommend venesection, and the depleting system in the above mentioned fever, and to shew that this treatment, instead of producing deleterious effects, instantaneously relieved the distressing symptoms and prostration of strength, while it cut short the disease. Mr. H. considers the fever as arising from local or endemic causes, and that it was not an imported or contagious disease. These local causes were:—

"The excessively crowded population of the place; the "houses and sheds being literally huddled together in so "limited a spot, without arrangement, and of the worst con- "struction; the doors and windows being generally on the "same side of the apartments, so as to preclude a free access "of air and ventilation; and among the lower orders of "Portuguese, Spaniards, and Jews, these dwellings are "usually shut up during the whole of the day, from sun-rise "to sun-set, consequently, on their return, they must breathe "a very impure air, almost wholly deprived of its oxygen; "the immense collection of animal and vegetable matters, "arising from so great a population, during the dry summer "months, remainmg stagnant from May till the end of Au- "gust, and which become roused into action at the end of "the autumnal season by the partial rains, when the quantity "of water is not sufficient to propel them through their re- "spective drains, which are too narrow for their evacuation, "being frequently choked and bursting. At this season, also, "the heavy night-fogs succeeded by a parching sun, occasion "exhalations extremely noxious and unwholesome. To these "may be added the peculiar situation of the town, which is "on the western foot of a steep rock, about 1400 feet in

" height, running nearly north and south, the air remaining " nearly stagnant during the prevalence of the easterly winds, " which continue, with but little variation, the whole summer."

After relating some cases where venesection and other modes of depletion were serviceable, Mr. H. observes that not one died who lost blood and was under his sole charge. " Instead of producing debility, says he, or deleterious effects, " it is the very measure that prevents these happening. The " debility that we find arises from the increased action not " being reduced. The heart labours exceedingly, and, if the " volume of blood is not lessened, it continues to beat till " absolute exhaustion ensues, or the destruction of some im- " portant viscus essential to life. The disease must then take " its course; incessant vomiting comes on, terminating in the " black vomit, delirium, suppression of urine, hiccough, small " indistinct pulse, and the whole train of mortal symptoms. " Wine, bark, opium, brandy, æther, and all the stimulants, " we know to have but little effect when the disease is allowed " to arrive at this advanced stage, from active measures not " having been employed at its commencement."

Mr. H. judiciously remarks that although many have recovered from the efforts of nature, or trifling remedies, without bloodletting; yet that this was no just reason why the measure in question should be neglected in the severe forms of the Endemic. The following were the appearances on dissection observed by Mr. Humphreys.

" The body externally of a pale yellow colour, and very offensive. On removing the skull-cap, the dura mater extremely vascular, and turgid, as was the surface of the brain. Cutting into the substance of the cerebrum, the vessels much injected, and the cut surfaces soon became covered with blood, and in some instances, three or four ounces of serum have been found in the basis of the cranium. On opening the abdomen, most of the viscera in the cavity inflamed, the vessels of the omentum, mesentery, large and small intestines, very turgid. The stomach contained a quantity of dark or black slimy fluid, adhering closely to the internal coat, which was red, and also inflamed. The kidneys generally of a livid cast, and, when cut into, there was, in some, an unusual quantity of a purplish-coloured fluid. The urinary bladder sometimes found to contain two, three, and four ounces, and in other instances, scarcely any water."

From what has been premised in the two foregoing documents, the unbiassed part of the profession will, I think,

conclude that although the Gibraltar fever has a *local origin*, yet, that when the Endemic, from any atmospheric or other cause, has risen beyond the *usual* annual level. It assumes, under circumstances of crowding and filth, a *contagious* character. By endeavouring to bend the disease, like the patients of Procrustes, to their own theories, the Contagionists, and Anti-contagionists have probably erred. It is "*aut cæsar aut nullus*" with both parties—all contagion or no contagion! But Government, as well as Physicians, will act with wisdom, in viewing these fevers with a suspicious eye; for the hardships of a few will, in that way, be the safety of many. By considering these scourges as, in general, of local and domestic origin, but occasionally ripened into a contagious maturity, we relax not in the measures which experience has proved to be efficacious in counteracting either form of this proteian enemy.

Dr. Dickson appears to have adopted an opinion, on this point, very similar to my own, in using the designation—"*diffusible*" disorders, to express, not a native and permanent, but an acquired and temporary power of dissemination. In a late communication "he proposes indicating the *degree* "of such power by a change of termination. Thus using the "same epithet [for the propriety of which he does not con-"tend, but only for the sake of illustration] a diffus*ive* disease "might signify that which can or may diffuse itself; and a "diffus*ible* one, that which can or may *be* diffused; the lat-"ter requiring for this purpose the co-operation of a peculiar, "but transitive coincidence of circumstances. For such pur-"poses, he remarks, we have the potential *active*, and po-"tential *passive* adjectives as they are called by Horne Tooke. "Belonging to the *former* we have the termination *ive*, bor-"rowed from the latin, and *ic* from the Greek:—belonging "to the *latter* we have, (from the latin *bilis*) the terminations "*able* and *ible*; and also the contraction *ile* having one com-"mon signification. Scaliger distinctly points out the force "of the two terminations, *ilis* and *ivus*, 'duas habuere apud "latinos, totidem apud græcos, terminationes—in *ivus* activam "in *ilis* passivam, &c." Dr. Dickson further suggests whether, in speaking of absolutely contagious or infectious diseases we might not, by the noun-substantive or adjective, indicate a *greater* or *less* degree of such power; as in the *latter* by the terminations *osus* and *ivus* &c. ex. infectio*sus* and infect*ivus*?—"Hæc omnia infectiva appellantur."—Vitr.

With respect to the treatment, there can be little question as to the utility of purgatives, mercury, and venesection.* It is probable, however, that the anti-contagionists, who are also the principal advocates for extreme depletion, have sallied too far on one extreme; while the contagionists have erred, on the other, by entirely neglecting a powerful means of arresting the march of fever. Time may yet reconcile the differences of opinion, as well as the discrepancies of practice.

Analytical Review of Sir JAMES FELLOWES'S *"Reports of the* PESTILENTIAL DISORDERS *of Andalusia, which appeared at Cadiz in the years* 1800, 1804, 1810, *and* 1813, *&c.*

SEC. IV.—When the livid hand of pestilence presses heavily on any portion of the human race, however remotely situated, is there any one so immersed in the toils, or absorbed in the profits of his profession, as not to lend an ear of sympathy, or at least of curiosity, to the disastrous tale? Sunt lachrymæ rerum, et mentem *mortalia* tangunt!

The reading and the thinking part of the medical community in England, have long complained of the mysterious silence which our army practitioners maintained, till very lately, respecting the fevers which ravaged the Southern Parts of Spain since the beginning of the present century; but the blank is now pretty well filled up, though the discrepancies of opinion are as great as ever! The volume of Dr. Pym, though embracing a great variety of subjects, and particularly those of the present work, was chiefly *disputative* and did not, by any means offer, either so instructive or interesting a picture of the great events described, as the volume now under review. We hope, therefore, to present our readers with such a condensed view of the medical topography and fevers of Andalusia, as cannot fail to arrest their

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Dr. Mc. Millen, who had ample experience in the West India fever states—"after an examination of the sick in the town and garrison of Gibraltar, and "the appearances on dissection, I pronounced the disease to be the yellow "fever of the West Indies, and not contagious. I immediately ordered bleeding to be employed freely at its commencement, and almost every patient "recovered with whom this remedy was used." *Burnett, 2d Ed. p.* 354.

attention, excite their sympathy, and increase their store of knowledge, during its perusal.

The present subject is comprised in four Reports; the fifth being occupied with observations on the Walcheren fever. We shall follow Sir James Fellowes's divisions seriatim.

Report 1.—Part I. *Medical Topography of Cadiz.*

The area on which this city stands is about a square mile, raised above the level of the *nearly* surrounding ocean, from nine to forty-seven feet. The superficies of the soil is pure sand, except where crusts of the subjacent rock occasionly appear. The population in 1813, when the last epidemic prevailed, was computed at 70,000 souls. Since 1800, the dead bodies have been buried in a cemetery, a mile from the town. The situation of Cadiz is singularly striking. On making it from the Westward, the city seems to rise majestically from the ocean, the nearest high land being the Sierras of Xeres and Ronda, distant fifteen leagues. Cadiz, which was anciently supplied with fresh water by the famous aqueduct from Tempul, has now nothing but wells and *morias* of brackish water within its walls. Every house, however, has its *algibe* or cistern, in which water is collected from the flat terraces during rains; in defect of which, water is brought from Puerto de St. Maria in boats. Cadiz was anciently celebrated for the salubrity of its air, and fertility of its soil, but at present there is not much occasion to boast of either!

The most crowded and ill-ventilated part of Cadiz is the district of St. Maria, where the posadas, taverns, and lodging houses for the lowest classes of inhabitants are situated, and where epidemic diseases first break out in general.

Each house consists of three or four stories, terminating in a flat brick roof *(azotea)* or terrace, on which are erected towers of stone or painted wood, with turrets aud ornaments in the Moorish fashion, that produce a most picturesque effect when viewed from the bay. The buildings are constructed with a multiplicity of doors and windows, that admit of a very free circulation of air, while the elevation of the peninsula above the level of the sea, offers natural facilities for public drains to cross the town in all directions, rendering it one of the cleanest and neatest cities of Europe.

During summer, sea and land breezes prevail, the former from the N. W. quarter, and the latter from the North East.

These, in winter, are changed into violent South West gales, accompanied often by heavy storms of rain. In summer, the *Levanters* alternate with the sea and land breezes, to the great annoyance of the inhabitants. This wind, which is so hot and dry as to scorch the tender plants and ripening corn, covers the neighbouring mountains with a heavy dark mist. At this time the circulating system in the human frame becomes wonderfully deranged. "The fibres are irritated; the quality of the bile itself is altered, and the most pacific quiet temper is rendered irritable." This wind comes in a southerly direction over the scorching plains of Africa. Cholera morbus; bilious diarrhœas; violent pain and giddiness of the head, and even fatal apoplexies are the consequences of these levanters. The Andalusian fever has always been much influenced, if not occasioned by this wind. The atmosphere of Cadiz is very moist, every wind that blows coming over the sea, and being charged with humidity. In respect to diet, fish is the favourite food of the natives; in defect of which, soup, and the national dish commonly called *olla*, is the usual diet. It may be remarked, however, that the opulent indulge in gross, while the poor are forced on innutritious and unwholesome aliment, both classes exhibiting sickly constitutions, while there is no where to be seen the dark, but manly complexion of the Spanish nation. Upon the whole, although the climate cannot be called insalubrious, yet the circumscribed space into which so vast a population is crowded, together with the influence of sedentary habits and fluctuating passions, must operate in predisposing to, and aggravating a number of diseases, and particularly fevers of an epidemic character.

The following is a list of comparative mortality during the first six years of the present century. 1801, 2,359; 1802, 2,809; 1803, 2,463; 1804 (the year of epidemic fever), 4,751; 1805, 2,723; 1806, 2,726.

Part II. *Origin and Progress of the Cadiz Fever, in* 1800.

The first great sickness that nearly depopulated Cadiz appeared in 1466. A similar event took place in 1507. The epidemic of 1582 is *said* to have ceased through the intercession of St. Roque! In 1649, the plague was introduced into Cadiz, and raged three years, carrying off more than 14,000 persons. It was not till the year 1730, that the

disorder since known by the name of "El vomito negro," or black vomit, first made its appearance, and destroyed great numbers of the inhabitants. In the year following, it was equally dreadful, exhibiting spots of a livid, yellow, or dark colour, that covered the body, and were the certain forerunners of the black vomit. Don Josef Cervi, physician to Charles the Third declared, that it was *not* the plague; but Don F. Navarette affirmed, that this disease (el vomito negro), was introduced into Cadiz by a vessel from Spanish America, and that it spread to other parts of the Peninsula. Thus we see how early the discrepancies of opinion began, and how late they have continued!

In 1764, a similar disorder appeared in Cadiz, which was witnessed by our immortal countryman, Dr. James Lind. Salvaresa, a famous Spanish physician, has written a Latin, and Dr. Lind an English account of the disease; they both prove the disease to be one and the same with the late fatal epidemic, but Salvaresa says nothing of its being contagious; on the contrary, he attributes it to atmospherical causes and corrupted corn; while Lind so wavers in his opinion, that nothing decisive can be gleaned from him.

During a period of thirty-six years after the above fever, Cadiz remained healthy, notwithstanding its progressive increase of population. The last months of 1799, and the first five of 1800 were characterised by remarkably severe weather, so that at the end of May, there was scarcely any appearance of spring. All at once, however,—"The heat of summer set in from the *beginning* of June, and by the month of August, the mercury was at 90° Fahrenheit; while the *Levanter* tended to increase the distress which the intense heat of the weather generally occasioned." p. 33.

During the months of June and July, no material alteration took place in the state of the public health; but in the beginning of August, the scene began to change. A fever broke out in the district of St. Maria, which we have mentioned above, as the residence of poverty and theatre of filth. From this point it radiated in all directions; and in whatever house it appeared, all the family was ultimately attacked. A general consultation of the medical practitioners was now called, where violent discussions arose that led to nothing, but added to the universal confusion and dismay! The prevailing disorder was attributed to various causes, and was

variously denominated, but the anticontagionists were evidently superior in number, for no precautions were taken against contagion.

About the middle of August, when the daily mortality amounted to twenty-five or thirty, all heads were laid together to find out the source of the evil, and they soon pitched upon a ship (the Dolphin) from Spanish America, where it seems some smugglers had received the infection and subsequently spread it through the town. This story is so extremely weak in itself, and badly put together, that we shall not attempt to trace it; but we earnestly recommend a careful consideration of the very unusual *atmospherical* phœnomena which preceded this epidemic, before it be finally arranged in the class of imported contagions.

On the 23rd of August, the image of our Saviour was carried out to appease the anger of the Deity, while the concourse and conflicting passions of the vast assemblages of people rapidly augmented the mortality to 157 per diem! By the middle of September, the diurnal mortality amounted to 200, and Cadiz presented the most melancholy scene of mourning and desolation! At this time the *disease* spread to domestic and other animals, and dogs and cats were seen dying with the black vomit. The very horses died! Will any man in his cool, unbiassed moments of reflection believe, that the cause of *fever* in these animals was wafted across the Atlantic within the sides of the Dolphin?*

The first check to the epidemic was the appearance of Lord Keith's hostile fleet, which, early in October, menaced a descent on the desolated city of Cadiz. We well remember the time. We saw the signal fly for the disembarkation. We saw the British bayonets bristle in the bay, ready to drink the blood of the wretched garrison and citizens. But the great hand of Nature interposed.—The conflcting elements burst forth in a hurricane that purged the city of "plague, pestilence, and famine," and dispersed, in a thousand directions, the invading fleet!

The neighbouring towns of Puerto Real, Port St. Mary's, Chiclana, Rota, &c. being afflicted equally as much as Cadiz, the fever was, *of course*, traced to the emigrants from the

* "The *air* from its *stagnant* state became so *vitiated*, that its *noxious qualities* affected even animals." p. 45. We would ask Dr. F. what these noxious qualities were? Were they merely the consequence of *quiescence* in the atmosphere, or were they the consequence of pollution from *exhalations* mixed therein? The *former* cannot be maintained, and the *latter* proves that *febrific* miasmata may exist *without marshes*.

latter city. Between the beginning of August and first week in November, 48,688 people were attacked by the epidemic in Cadiz, of which number 7,292 died. In Seville the mortality exceeded 22,000; in Xeres, 10,000. Thus ends the history of the Epidemic.

Part III.—*Description of the Fever.*

The symptoms of this epidemic are divided into two classes —regular and irregular. The former gave no warning, but invaded the patient suddenly; somtimes between four and twelve o'clock in the morning, but *generally* in the night. Chilliness; violent pain across the forehead and temples; in the loins, and lower extremities; lassitude; yellow colour of the skin, especially about the third day. The countenance assumed a faded appearance. The cornea opaca of a red yellow. Restlessness; deliquium on standing up. The pulse was very irregular. To loss of appetite succeeded vomiting, but seldom diarrhœa; pain at the pit of the stomach; sweat and urine entirely bilious. A remission of these symptoms took place at the end of twenty or twenty-four hours, with an exacerbation the next day. Then a remission, or apparent apyrexia on the third, sometimes on the fourth, fifth, and seventh day, the latter very rare. During this time, the animal functions were seldom disturbed; but debility and anorexia continued long after the fever had disappeared. The irregular or anomalous signs of this disease were as follow: sensation of cold or rigor; dull pain of the head and eyes, which appeared swollen, heavy, and extremely red. The heat of the body natural; tongue tremulous and dry, with a dark stripe in the middle. Insensibility; frequent efforts to vomit; weight and uneasiness about the region of the liver; pain and burning heat at the pit of the stomach. Change of colour to a leaden hue. Coldness of upper and lower extremities; continued or interrupted vomitings, first of a bilious, afterwards of an atrabilious matter; in other cases entirely black. The discharges from the bowels of the same colour, appearing like ground charcoal. Perpetual jactation; violent pain in the throat; difficult deglutition; deafness; red, black, or livid spots, especially on the parts pressed on. Yellowness; discharge of black blood from the mouth, nostrils, anus, eyes, ears, &c. were the precursors of death. The following were always *fatal* symptoms: dark red, or sublivid colour of the tongue; darkness under the eyes; sup-

pression of urine; irritation of the urethra, about the glans penis, forcing the patient to squeeze the penis.

Some patients had violent mad delirium, others continued in a comatose state. Many preserved a firmness of mind to the last moment of their lives. Several had tumours; three had carbuncles. A cutaneous erruption was common, and considered favourable. It spared those in advanced age, as also newly-born infants and young children. People of soft skins and mild dispositions escaped better than those of an opposite description: females experienced a greater immunity than males. Those about the age of puberty, of strong constitutions and dark complexions, experienced the most violent attacks; but to the pusillanimous it was most fatal. Those born in hot climates had the advantage over those from cold countries. Early yellowness on the skin was an indifferent symptom; after the sixth day, it was favourable. Rigor, or sensation of *intense* cold, at the beginning was unfavourable, as was the total absence of sensation of cold. Regular and lasting shivering fits afforded the best presages. Severe pain at the pit of the stomach was a bad sign, especially if accompanied with dark-coloured vomitings. Few cooks escaped the disorder. The earlier the black vomit the greater the danger. "*Relapses were very frequent and fatal.*" Yet Aregula asserts, that the yellow fever of Andalusia only attacks persons once in their lives.

Appearances on Dissection.—Black or coffee-coloured matter in the stomach, duodenum, and colon. Gangrenous spots on the same viscera. Liver enlarged, and altered in appearance, approaching to the hue between yellow and black. Lungs speckled with black and gangrenous spots. "It was not uncommon to find some parts of the brain livid." Yellow colour of the skin, fat, and secretions very common. No other anatomical investigations were made.

Thus ends the Cadiz Epidemic of 1800. Nothing is there said respecting the treatment, but some general observations on this head will be introduced hereafter. We shall here, however, insert a passage from the *conclusion* of Sir James's Work, which does not exactly quadrate with the opinions delivered above.

"As far as my experience goes, I should be induced to believe that human contagion having acquired a concentrated virulence from a combination of *peculiar circumstances, joined to the epidemic tendency of the bilious remittent of the country*, gave rise to the pestilential disorder in Spain. It is pos-

sible, that persons coming from Vera Cruz or the Havannah, and carrying with them the seeds of *disease, admitted to be endemic in those places*, might, during their passage in a crowded ship, undergo such a change of constitution as to produce the disorder, with the *additional* property of generating it in others highly predisposed." p. 403.

Now passing over some obscurity and confusion which run through the above passage, we appeal to our readers, whether it is not an acknowledgment of the truth of the doctrine which we have so often maintained. We also appeal to our readers, whether it is not almost a literal copy of the passage at page 81, written and published many years before Sir James's work appeared.

Sir James next enters into a long detail of the topography of Gibraltar, and the history of the fever of 1804. Sir James treads in the steps, and embraces the same opinions as Dr. Pym, in opposition to Dr. Burnett and Mr. Amiel. He is, however, much more minute than Dr. Pym, though we cannot say that he has at all *increased* our credence in the contagion creed; nor have his arguments convinced us, that the disease was imported from Cadiz in the person of the *now* celebrated Santos. We shall here, however, copy a note from Sir James, relative to the topography of the spot from whence this fever radiated.

" The unhealthy circumstance to which Colonel Colville alludes, was the public drain or sewer running from the barracks; which, from being uncovered, and from the want of water to cleanse it, was, during the heats of summer, *extremely offensive;* it was, at *this time particularly so*, the barrack necessaries having been emptied into it, and the *contents not having then run off*. The huts, in which so many sick inhabitants, and some of the married people were living, were built *adjoining the sewer*, and some *immediately over it*, with a *single boarded floor intervening*. The disorder prevailed *particularly on this spot*." 139.

It would hardly be believed, that the man who could write this passage, would gravely inform us, that " marsh miasmata" exist not at Gibraltar! This is one instance of the importance of a *name*;—Vegeto-animal, or *febrific* effluvia, will as assuredly spring from the source described above by Sir James, as from the plains of Zealand or the sedgy shores of the Ganges. What madness of *party* is it then, to cling to the name of *marsh misma* as an argument against endemic disease.

Those divisions of the work before us on the fever of Malaga, in 1803-4, are not very interesting. According to Aregula (our author's sheet anchor on all occasions), the *infection* was brought to Malaga in four vessels; one from Smyrna, two from Marseilles, and one from Monte Video! Sir James traces it from a point in the *low dirty quarter*, or district of Perchel, which is often overflowed by the Guadalmedina.

"Even with the least torrent of the Guadalmedina, the streets are overflown; which, upon the waters retiring, are left full of mud and clay." 158.

Upon the symptoms of the fever we shall not dilate. They were by no means exactly similar to those of the fever at Cadiz and Gibraltar; though, if they all resulted from one specific contagion, there ought to prevail a considerable uniformity. We have long laid it down in our own minds, that the fevers resulting from marsh miasmata are not all of precisely the same nature, but are considerably modified by the locality of the cause. The miasmata of Batavia for instance, will produce a disease differing in many points from the fevers of Walcheren or Philadelphia; and it has been proved, that acclimation to the miasmata of one place is no sure protection from those of another. I have stated that veterans in India, and even the blacks, fell under the malignant influence of the miasmata of Batavia, though they were, in a great measure, proof against those of Bengal, Bombay, and other sickly parts of the East. Indeed, it is quite reasonable to suppose that febrific miasmata must differ essentially in different situations, and that the fevers they produce must vary with their causes.

The epidemic of Cadiz in 1810, at which time Sir James was head of the medical department there, is very cursorily passed over; in fact, no account at all is given of it, except that it was similar to the fever of 1800, which Sir James did *not* see! We must say, that Sir James has evinced rather too much modesty, in keeping back the whole of his own *personal* observations, while he has been so very liberal in his quotations from our good friends the Dons.

Epidemic of 1813.—In the month of August, 1813, the heat varied at Cadiz from 81° to 91° Fahrenheit, and sometimes rose to 95°, with an easterly wind and cloudy atmosphere. This temperature was considerably above that of the same period in other years. Early in the month of September, a fever of a suspicious nature made its appearance in the well

known abode of filth and poverty, *the Bario of St. Maria*, and soon afterward spread to other quarters of the town. A report of our author's on this occasion induced the British troops to evacuate Cadiz, and encamp eight miles distant, while the government taking alarm, decamped also. It is remarkable, that on this occasion, a committee of the principal medical men of the City, excepting three (Aregula, Flores, and Gonzales) gave in a certificate that no pestilential disorder existed at the time. The cases, however, which our author witnessed during this epidemic, appear to bear a most striking resemblance to those of *Batavia*, related in the section on Endemic of Batavia, both as to symptoms and mortality.

We shall here introduce a few specimens of the Spanish *practice* in these fevers. The *general* treatment was on the plan of Aregula; but the singular success which is said to have attended the practice of La Fuente deserves consideration. His plan was to force the patient, if possible, to swallow six or eight ounces of bark within the first forty-eight hours of the disease. At the village of Los Barrios, a few miles distant from St. Roque, ninety patients took the bark within the first *eight hours* of the fever, of whom *none* died, excepting one man, carried off by a gouty affection. Of eight patients, to whom it was administered between the eighth and tenth hour, all recovered. Of five, who began between the twelfth and twenty-fourth hour, three recovered and two died. Of twenty, who did not take it till the second day, thirteen recovered and seven died. Of seventeen, who waited till the third or fourth day, eight recovered and nine died. And lastly, out of eighty-nine persons who made no use of the bark, but took other remedies, only twenty-two recovered and seventy-seven died.

So much were the judicious part of the inhabitants assured of these facts, that they contended, as it were, who should take most bark in the first forty-eight hours, and who should begin earliest. A patient generally sent for half a pound or more of the bark, the moment he felt the first shiver, and swallowed it in large spoonfuls to the amount of half an ounce or an ounce every two hours, without losing time, or allowing himself rest or sleep, either by night or by day. Many patients took ten, twenty, or even thirty ounces of it in a few days. Without being advocates for such a practice, we are strongly disposed to believe, that the effects of such a quantity of bark in the *very first moments of a fever*, might

really have been such as are represented; for we must recollect, that *then*, no great inequilibrium has taken place in the balance, either of the circulation or excitability; and that from the strong sympathy existing between the stomach and all other parts of the system, such an impression might have been made on the constitution, by the above extraordinary plan, as to arrest the further progress of the fever, in the same way as the cold affusion has checked the febrile catenation, *in limine*. It is evident, however, that *after* any determination has taken place towards an organ, or in other words, *after* the balance of the circulation is much broken, the plan in question would be certain destruction. On this account also, it must rather be a self-adopted than a prescribed mode of treatment, since, in the latter case, the practitioner rarely sees disease in its very incipient movements.

"With respect to the treatment of the fever," says our author, "it may be remarked, that the general plan of cure consisted in early evacuating the stomach and bowels with the least possible irritation, and in supporting the force of the circulation." (We would rather say, preserving the due balance, or equal distribution of the circulation, than supporting the *force* of it in fever.) "It is to be observed, that an unusual torpor of the bowels attended this disease. Our practice in the military hospitals was principally directed to remove this, by means of six or ten grains of the subm. hydrarg. with or without an equal quantity of the ex. col. com. followed up by purging salts and injections. This plan generally produced copious alvine evacuations. The following day, a pill of two grains of the submuriate, with James's powder, was given every two hours. It was continued as long as there was an absence of untoward symptoms, or until the third day, when the tinct. cinchonæ was administered in doses of a tea spoonful, frequently repeated. The decoction, powder, extract, aud tincture united, were afterwards given, according to the state of the patient's stomach: light and nutritious diet, in small quantities, were given during this time, with barley-water or tea. Porter was equally grateful and beneficial.—In most cases, where the calomel was given, either with or without antimonial powder, it produced a lax state of the bowels, and a moisture on the skin, with immediate relief of the head-ache; and frequently with a diminution of the other febrile symptoms. I am persuaded, that, with proper management, it is, of all others, the most power-

ful and useful remedy in fevers, whether arising from human contagion or marsh miasmata." p. 406.

Bleeding did not succeed in this fever, according to our author, and emetics were improper. In conclusion, Sir James remarks—

"From all the observations that I had an opportunity of making in this disorder, and from which any practical inferences could be drawn, it appeared to me, that on the application of the poison to the stomach, which I apprehend to be the organ most directly affected, a morbid change took place in the gastric and other juices, which, by their peculiar stimulus on the nerves of the stomach and bowels, occasioned many of the febrile phænomena, and that the *bile* was the fluid principally acted upon. A consequent derangement in the ordinary secretion of the liver generally succeeded to a considerable extent, and thus the irritability of the system being increased, tended to keep up the fever. That such an effect is produced on the bile by poisons, human contagion, or marsh miasmata, will, I think, be admitted; and I have shewn, that in the treatment of the pestilential fever of Spain, and the bilious remittent of Holland, this predominance was strongly marked, and a correspondent principle of cure was adopted and constantly kept in view." p. 409.

Whatever may be thought of this reasoning, we believe the facts are correctly stated in the above passage. We are of opinion, however, that venesection either had not a fair trial, or has not been fairly stated by those who have *yet* written on the fever in question, among the contagion party. The evidence of the utility of mercury is here unquestionable; and its liberal use, no doubt, made some amends for the dread of the lancet.

We have now collected into a focus the most prominent traits and interesting facts which our author's work presents us, relative to those scourges which desolated the vales of Andalusia. We trust that we have thus formed for our readers, who *cannot* peruse the original, an interesting epitome, that may prove no mean substitute for the volume before us; while to those who can afford the leisure and expence, we recommend the work as by no means undeserving a place in the philosophical wing of their library. To those who may be doomed to visit the peninsular shores of the Mediterranean, the publication of Sir James Fellowes is strongly recommended, as a very respectable companion to the volumes of

Bancroft, Burnett, Irvine, and Pym. The work is written in a very gentlemanlike manner. Sir James will scarcely "hint a fault or hesitate dislike," even to the most prominent of his adversaries. Dr. Bancroft is the only man at whom he levels any thing like censure.

Analytical Review of Mr. Doughty's *Work on the Yellow Fever of Cadiz; published in* 1816.

Sec. V.—The first part of Mr. Doughty's work is dedicated to the yellow fever, as it appears in the West Indies, where our author served eight years, and where of course he had ample opportunity of becoming intimately acquainted with the nature of the disease.—His memoirs shew the superiority of bleeding, mercurial purgatives, cold and tepid affusion, &c. over every other plan of treatment. We shall pass over this division of the work entirely, in order to extend our analysis of that more immediately interesting at the present period—the fever of Cadiz.

Our author landed at Cadiz in July 1810, and immediately entered on duty at the *Hospicio*, and soon after at the Aguada. In the months of July, August, and September, the heat was as oppressive as Mr. D. had experienced it in the West Indies. Our author becoming extremely bilious and dyspeptic, removed for a fortnight to Gibraltar, where the temperature and sultriness of the atmosphere were still more excessive than at Cadiz. He returned to the latter place early in October, leaving Gibraltar just as the fever broke out in the transports, as stated in Dr. Pym's work

In Cadiz it had made its debut simultaneously with that on the rock; and had excited various and discrepant opinions. The most *general* belief was, however, that the fever was of local origin. Mr. D. had little difficulty in recognising it as similar to the yellow fever of the West Indies, of which he had had such ample experience.

"I was immediately struck with the peculiar coincidence between the disease, as it then prevailed, and the yellow fever of Jamaica, in all the prominent symptoms and appearances observed."

Two officers having died of the disease in the St. Elena barracks, Mr. Doughty obtained leave to open them, and

stated the result in an official letter to Sir James Fellowes. The most incontestable proofs of inflammation and congestion were found in almost all the important viscera, particularly the brain, heart, lungs, and stomach.

"It might not be unreasonable to infer, that Sir James would have *officially* acknowledged the receipt of this communication; but he never did; nor has even deigned to mention it in his publication. Perhaps it was better to be silent regarding a circumstance which might militate against the *theory of contagion*." 99.

Mr. Doughty states, in the next page, "that he never had the honour of seeing him (Sir James) by the side of any one of the many bodies he opened." So strong was our author's opinion of the fever being non-contagious, that he wrote a letter to the Duke of Kent on the subject, in which is the following passage:

"No medical officer of this army, I feel convinced, has taken such probable steps to acquire a knowledge of this disease as I have, *being the only one who has had recourse to dissection*, to obtain information on this head."

For this paragraph Mr. Doughty was tried by a military court-martial, and dismissed the service! And it moreover appears from Mr. Doughty's statement, and an extract from Sir James Fellowes' charge on the court-martial, that he, Sir James, prohibited all anatomical investigation of the disease, because, forsooth, "He judged it necessary to *check at once*, what bore "on the face of it, *a sort of inhumanity*, and a "prejudicial tendency, inasmuch as it might excite in the "minds of the soldiery the strongest prejudices against their "medical attendants, and a belief that they were *prematurely* "consigned to *death*, for the purposes of dissection and be-"ing *anatomized!!!*"

As I believe the annals of medical literature do not exhibit a parallel to the above passage, I conceive that it is worthy of being transmitted down, as a beacon of danger to the zealous cultivator of pathological knowledge, as long as Science waves her torch of light over the gloom of intolerance!

Previously to this medical *inquisition* on the sins of anatomy, Mr. Doughty was enabled to examine the bodies of many victims to this fever; and eight dissections, with cases more or less detailed, are given; from which "I appeal (says Mr. D.) to every unbiassed reader, who may honour these pages with a perusal, or who has seen yellow fever in

any one of the West India Islands, whether the shades of difference in the several symptoms, during the progress of the disease, or the morbid appearances after dissolution, can any ways be said to constitute a distinct order of fever from that which *ever has* been annually, more or less, and I fear, ever will be, amongst strangers from the more northern regions: a periodical visitant of intertropical climates, in particular situations; and an occasional attendant in certain places lying in or near the 40th degree of latitude." 171.

These *post mortem* appearances would certainly, in any unprejudiced mind, have indicated the use of the lancet; but no such weapon was ever wielded against this formidable endemic. In our review of Sir James's Reports, we stated that there appeared ample materials for originating a fever in the "*Barrio or district of Sante Maria*," without any imported fomites from the western hemisphere. Our opinions are confirmed by an eye-witness, who took up his residence in the very vicinity of this focus of disease.

"The olfactory nerves (says Mr. D.) were here assailed with the most noxious exhalations, and the eyes disgusted with every sort of filthy and excrementitious matters thrown indiscriminately into the streets. Fish bones, rotten vegetables, and rotten matters of every description, mixed together by contents from the receptacles of the night, formed the *delectable* covering of most of those extremely crowded and ill ventilated streets. Will any one tell me, that if Cadiz was built on a rock of adamant, and its streets to be covered from time to time with matters of this description, on which the solar influence might operate a degree of heat equal to 95, or 100, often experienced out of the shade in that city, in the summer months, there would not be just grounds to expect the generation of fever." 180

In respect to Dr. Pym's grand argument, namely, the *non-liability* to second attacks, Mr. Doughty acknowledges that persons who have once passed through the more aggravated forms of endemic fever, are comparatively secure, *for a time*, from subsequent attacks, and indeed this may be said of typhus, and the plague itself. But we are convinced with Mr. D. that this immunity is only temporary, till the susceptibility is again regenerated by a colder climate, or purer air in the same climate.

Mr. D. here instances the case of the 85th Regiment, which suffered dreadfully from the concentrated form of yel-

low fever in Spanish Town in 1805. The next season they escaped it entirely in Fort Augusta, but again in 1807 they were nearly annihilated in Kingston. At the latter time and place, Mr. Doughty himself was at the brink of the grave from an attack of yellow fever, though seven years previously, he asserts that he had it in its concentrated form in the same town!

Dr. Pym rests much of his force on the immunity which certain individuals whom he specifies, experienced on the rock of Gibraltar, because they had had the fever in the West Indies. We could wish him to explain the following immunity:

"In the season of 1810, (at Cadiz) to which my own particular observations relate, there were doing duty within the walls of Cadiz, and at the Aguada, two physicians to the forces, two surgeons to the forces, one deputy purveyor, an apothecary, five or six clerks, and twelve or fourteen regimental and general hospital assistants, not one of whom (independently of Sir James Fellowes and myself) *had ever been in the West Indies, or where this fever before prevailed*; yet not one of them was attacked, although several attended patients labouring under the disease, as well as assisted me in the dissections I have given."

The difference of medical topography in Cadiz and the *Isle de Leon* is very striking, and satisfactorily accounts for the superior salubrity of the latter. The town of *Isla* is formed principally of one long, wide street, the buildings of which are large and not crowded together. They are consequently well ventilated and free from filth. The *Isla* in its soil is almost entirely marine sand, and is washed in three-fourths of its limits by the sea. The neighbouring *marshes*, as they are called, are mere excavations of the earth for the reception of sea water, and are perfectly barren, or sprinkled here and there with the barilla shrub. It is evident that they are not the sort of marshes which exhale febrific miasmata. We would now wish to turn the attention of the medical public towards the *treatment* of the Cadiz epidemic in 1810.

"In not one case of the fever at Cadiz in 1810, was venesection ventured on; how far its utility in the early stage of that disease, would have been found, I can therefore only conjecture. The morbid appearances discovered on dissection, particularly the striking indications of strong vascular ac-

tion in the brain, with congestions and extravasations of blood; the same in the lungs and thoracic cavaties; and the almost invariable appearance of inflammation of the villous membrane of the stomach, clearly, I think demonstrate, that a copious abstraction of that fluid, at the onset of the fever, would have been a judicious practice; and that those derangements found in the parts mentioned, would have been thereby averted. Hence, the great utility of inquiry by dissection, when our endeavours in the treatment of an insidious disease have proved abortive." p. 218.

It is melancholy to think that, after all the lights which have been thrown on the subject of fever, and many other diseases of late years, and the almost innumerable evidences of the utility of blood-letting, and other evacuations therein, an hypothetical preconception should, in 1810, give rise to a mode of treatment little better than that which resulted from the ravings of Brunonianism!

In order to substantiate this charge, we shall here give as a specimen of the general practice, one of the cases detailed by Mr. Doughty, with the appearances on dissection.

"Mr. Bower, ætat. 41, was attacked with fever on the 19th of November, accompanied by violent vomiting and purging, the matters ejected being bitter to the taste. Cathartic extract and calomel till copious evacuations were procured.

"20th. In the evening Dr. Plenderleath was called in, who considered it a well marked case of the epidemic. His countenance at this time exhibited a very *flushed appearance*; he had much pain across the *forehead*, and great sickness at stomach. Tongue white and dry; pulse rather full, *strong*, and *expanding*; frequent bitter vomiting. Dr. P. directed two grains of calomel, two of antimonial powder, and half a grain of *opium* every *two hours*. Four ounces of infus. sennæ were ordered, but not given. The pills were continued all day, and a purgative enema administered. 9 P. M. Symptoms the same. The injection repeated. Dr. P. ordered a blister to the stomach, and one grain of *opium* to be taken.

"21st. Dr. P. considered his patient had a remission of fever, and directed from one to two drachms of bark in substance to be given every three hours; the above-mentioned pills to be given alternately."

"22d. This morning, Dr. P. considered his patient in a state favourable to recovery. In the *evening* he observed, that a most unfavourable *change* had taken place." (No

wonder!) "The nausea and vomiting recured;* a diffused yellowness appeared over the surface of the body. Stupor. Blister to the nape of the neck; purgative injection. Tincture of bark and sulphuric æther to allay the vomiting. One grain of opium at bed-time."

"23d. Patient thinks himself better; pulse not very unnatural. Tongue black towards the uvula, but moist; yellow suffusion of a darker hue, particularly about the neck and breast. 12 *o'clock.* Slumbering and groaning alternately; insensible, except when roused; tongue black, dry, and rough. He expired at ten o'clock at night.

"*Sectio cadaveris.* Surface of the body exhibited a light yellow suffusion intermixed with livid blotches, as in the other cases. On removing the skull-cap, a considerable quantity of *extravasated* fluid blood in the direction of the falx. The whole surface of the cerebrum in a *great degree inflamed.* In several parts, bright red spots, and over the pia mater generally, a white lymphy appearance. Great vascular turgidity throughout the several convolutions of the brain, from the substance of which, when cut into, a considerable portion of red bloody fluid escaped. Anterior lobes of the brain resting on the optics greatly inflamed, and the vessels distended. About a drachm of yellow fluid in each ventricle; interior surface of the ventricles very vascular; plexus choroides uncommonly so. On removing the cerebrum, a portion of extravasated blood was found in each depression of the skull. Surface of the cerebellum inflamed, and covered with a lymphy matter; about an ounce of a sanious fluid round the medulla oblongta; medullary substance of cerebellum dotted with red particles of blood. In the thorax nothing very unusual. In the stomach about half a pint of greyish fœtid fluid; various parts of the villous membrane of this viscus exhibited an appearance like matter of this colour, and in various parts had evident marks of great inflammation, particularly about the fundus. Spleen rather large, and black internally; liver very lage, but structure not apparently altered, except on the concave surface of the great lobe, where it was of an olive colour. Gall-bladder containing inspissated bile like tar." p. 132.

With these dissections *officially* before the Head of the Medical Department, whatever his rank, we ask the profes-

* If the reader will compare this case and treatment with those detailed under the head of "*Endemic of Batavia*," *ten years* previously, he will see a melancholy *similarity*; and an incontestible proof, that the *Bulam* contagion produced the same ravages on the brains of medical men in Edam and Cadiz!

sion, whether the exhibition of opium, and the omission of blood-letting, were not most admirably calculated to augment those congestions and inflammations which destroyed the function and structure of the viscera above-mentioned? and, consequently, whether the injudicious, though doubtless well meant, interference of Art, did not produce a result less felicitous, than if the sufferers had been left to the efforts of unassisted Nature?

MINORCA.

Sec. VI.—From the geographical position of this Island, as contiguous to the great naval port of Toulon, Mahon has always been an important point of rendezvous and refit for the British navy. The necessity, therefore, of adverting to it here, is indisputable.

Medical topography.—The air of Minorca, in its more elevated parts, is clearer than that of England; but the vallies are infested with mists and fogs. The *summers* are dry, clear, calm, and excessively hot—the *autumns* moist, sultry, unequal—at one moment, perfectly serene; the next cloudy and tempestuous. In *winter* the storms, though sometimes very violent, are neither frequent, nor of long continuance. When they cease, the weather returns to its usual serenity. The *spring* is very variable, and more allied to the winter than to the summer.

The annual range of the mercury in the shade, is not very great—generally from a height of 80 to 87 in summer, down to 48 or 41 in winter. The difference between day and night is seldom more than four or five degrees.

In summer, a morning calm is commonly succeeded by a sea breeze, following the course of the sun, and dying away in the evening. The northerly winds are cold, dry, and healthy, dispelling the mists, and giving an azure sky. The north-east and north-west winds are, especially the latter, piercing cold, and frequently attended with rain. The south and south-east, in summer, are sultry, suffocating, foggy, and unhealthy. They affect the breathing—cause an excessive dejection of spirits among all ranks, and raise the mercury, on exposure, to 100° or upwards.

The sky in summer is clear azure, without clouds;—but dews descend regularly after sun-set. As autumn advances the weather becomes less serene, with occasional whirl-winds, and thunder storms. After the autumnal equinox the skies are darkened with clouds, and rains fall in torrents that come pouring from the hills, sweeping away cattle, fences, trees, &c. accompanied by thunder, lightning, and storms—

> ——————— Effusis imbribus atris
> Tempestas sine mora furit, tonitruque tremescunt
> Ardua terrarum, et campi: ruit æthere toto
> Turbidus imber aqua, densisque nigerrimus Austris.
>
> VIRG.

Excepting a few hills towards the centre, the whole island may be termed low land. The surface is rough and unequal, divided by long, narrow vales of considerable depth that run in winding directions from the interior toward the sea. In the north-east quarter, the hills are higher, with low marshy valleys unhealthy to man and beast. The soil is light and thin, and generally speaking, the whole Island has a barren appearance.

The principal diseases may be divided into epidemic, and sporadic. To the *first* belong cutaneous rashes—cholera—intermittents—fluxes—pulmonic complaints—Erysipelatous fevers, &c. To the *second*, obstructions of the abdominal viscera—-hæmorrhoids—-ulcers—-herniæ—-ophthalmic and nephritic pains.

Although *intermittents* are the grand prevailing fevers among the inhabitants of Minorca, yet that they occasionally degenerate into those of graver type, resembling the concentrated marsh fevers of all hot climates, may be learnt from Cleghorn—especially in the following passage. "But the utmost danger is to be apprehended, if a few drops of blood fall from the nose: "*if black matter like the grounds of coffee*, is discharged upwards or downwards: if the urine is of a dark hue, and a strong offensive smell: if the *whole skin is tinged with a deep yellow*; or any where discoloured with livid spots or suffusions."* *p.* 82. *5th ed.*

This respected writer informs us that he examined the bodies of nearly 100 persons who perished in these fevers—"and constantly found one or other part in the *lower belly* "[the omentum, mesentery, colon, &c.] of a dark colour, or

* "The *English* in Minorca are more liable than the natives to become yellow in fevers."—*ib.*

" totally disorganized: The gall-bladder full and turgid—
" the stomach and intestines overflowing with bilious matter—
" the spleen large, sometimes weighing four or five pounds,
" and excessively soft and rotten. In the cavities of the head
" and chest, nothing extraordinary was met with, excepting
" yellow serum—*when* the skin was tinged with the same
" colour." p. 84. This accords much with the result of Dr. Mc. Arthur's dissections in yellow fever. *See the section on endemic of the West.*

Of Dr. Cleghorn's mode of treatment we need not now say much, except that he bled and purged pretty freely before administering the bark, and that he condemned emetics. He is also of opinion that both intermittents and remittents are occasionally contagious—" and are often epidemical after extraordinarily hot, dry summers." 110.

The same observant author describes the epidemic pleurisies of Minorca as causing vast havoc in the winter and spring months. But what is most remarkable, they generally observed a remittent type. They commenced like an ague fit, with shivering and shaking—flying pains—bilious vomitings and purgings, succeeded by quick breathing—immoderate thirst—inward heat—head-ache and fever. In a few hours these symptoms became aggravated, the sick being seized with stitches in their sides striking upwards to the clavicle and shoulder-blade, or darting across from the breast bone to the vertebræ, with a load and oppression on the chest. The left side of the thorax was not nearly so often affected as the right. The patients raved at intervals, or were disturbed with frightful dreams. Mean time, the external heat of the body was, in several, very moderate—in some, less than natural; but for the most part it was intense. The pulse was very variable —frequently perfectly natural, while the patient was in the greatest danger. Nothing could be depended on from the appearance of the blood; and the only certain prognostic of safety was the ability to sleep soundly in the natural posture, and to make a deep inspiration without difficulty. Besides a morning remission, it was remarked that upon the third day, or beginning of the fourth, there was frequently a great remission—sometimes a total cessation of every violent symptom; so that the sick were thought to be out of danger; " but on the fourth or fifth, a delirium came suddenly on, or the breathing became more difficult than ever, and one or both of these symptoms increasing hourly, the patient expired in a day or two, either suffocated or raving mad." 127. Dr. C.

observes that "such was the rapid progress of these mortal pleurisies, that if any of them survived the seventh day, it seemed to be entirely owing to bleeding."—*ib.*

On examining after death, the lungs were the great seat of disease in all. In many they were converted into a hard liver-like substance, and sunk in water—in some the diaphragm was inflamed—Abscesses, or half-formed abscesses, with a sanious ichor, and a rotten gelatinous substance were frequently found even in those who died so early as the fourth day, either in the lungs, or between the lungs and pleura. In some bodies the pericardium was full of purulent serum, its internal membrane and the outer surface of the heart being affected in the same manner as the lungs and pleura. 128.

It would seem strange that such testimonies as these did not long ago warn the hectic patient from a Mediterranean climate, in which, a phthisical *predisposition* will be more suddenly called into action, and a confirmed *consumption* more rapidly hurried on to a fatal termination, than in England.

The intelligent physician from whom we are now quoting, soon discerned the utility of carrying venesection to a high degree, and in fact, practised with the same boldness as we do at this day. "Between 48 and 54 ounces of blood were frequently taken away during the first 24 hours of my attendance. This sudden copious evacuation, commonly procured a cessation of all violent symptoms. It was remarkable to observe, how quickly the sick recovered their usual health and strength, notwithstanding the great loss of blood they had sustained; while many who had been bled more sparingly, continued in a languid, infirm state for months, without being able to get rid of the cough and pains in the chest." 134.—How applicable is this passage to many other fevers, as well as pulmonic!

THE MINORCA FEVER;

Translated and condensed from a Latin Thesis,

WRITTEN BY DR. WILLIAM BOYD,

(Formerly Surgeon of Mahon Hospital),

Entitled—DE FEBRE MINORCÆ, &c.—1817.

Although Dr. Boyd did not meet with this fever under the *remittent* type, as described by Dr. Cleghorn, yet he considers it as only differing in *grade* from the marsh or bilious remittent of that and other authors. It is produced by the

same causes—appears in similar places—affects the same organs—proves fatal to the same classes of people; and only differs in consequence of atmospherical influences, and a greater intensity of force in the remote and predisposing causes.

This fever could be clearly traced to a *local* origin in Port Mahon; and was therefore not contagious, but a primary and idiopathic disease; assuming the *epidemic* character only from the state of the air, and the crowding of the sick. In spring, therefore, it appeared in its simple form. But these fevers, in various instances, *acquired* a contagious quality—that is, the power of propagating themselves from one individual to another. "*In casibus variis vim contagiosam haud raro acquirunt: id est, vim gignendi propagandi quoque eundem morbum ab alio ad aliud corpus.*" p. 3.*

Symptomatology.—The first symptom was a sensation of cold, which crept along the spine, and over the lumbar region. To this succeeded head-ache, generally confined to the forehead, temples, and orbits. The face became flushed and tumid—the eyes inflamed and suffused with tears—the carotids and temporals pulsated violently. The countenance now became entirely changed, and in a manner not to be described in words; while the patient betrayed great anxiety, restlessness—dyspnœa, with sometimes pain and sense of tightness in the chest, cough, inappetency—lassitude—thirst, and watching. The tongue is now whitish or yellowish; but for the most part moist, with a bitter taste in the mouth. The heart beats with great strength against the ribs—all the tangible arteries feel hard and full—and a soreness in the flesh is complained of all over the body. The epigastric region is now very tender; and there is nausea with bilious vomiting. Pains assail the loins—stretch down the thighs, and ultimately affect every joint and member. The bowels are obstinately costive. As the disease advances, the pulse feels less full, and is often weaker than in health; while the thirst and anxiety are aggravated. At this period, the superior parts of the body will sometimes be covered with a profuse sweat, while the skin underneath shall feel burning and rigid. If the fever proceeds, the hot stages are generally, but not always, preceded by rigors.

* Dr. Denmark, Physician to the Fleet, who was at Mahon during the prevalence of this fever, and who declares that he was a non-contagionist, observes—"These occurrences, however, served to stagger our belief; and a combination of subsequent events has conspired to make me a convert to the opposite side of the question."—*Med. Chir. Trans. vol.* vi.

When the patient neglects himself for one or two days after the first attack; or if the treatment have been inefficient or improper, then a very different train of symptoms takes place. Together with stupor, there will also be great pain in the head—a disinclination to answer questions—and an insensibility, or at least inattention to passing occurrences. The eyes will be more turbid—often inflamed. A yellow tinge will cover the adnata, and suddenly spread to the face and neck, and thence over the whole surface of the body, in less than twenty-four hours. The tongue now exhibits a thick yellow crust—brownish and dry towards the middle—red and inflamed at the sides. The strength becomes remarkably diminished—the stomach is harrassed with nausea and bilious vomiting—the heart beats less strongly, and more quickly—the countenance is collapsed, and the red tints unequally scattered over it.

After several accessions, and about the third day, these symptoms are suddenly and signally mitigated—the skin comes nearly to its natural temperature—the fever disappears, and nothing but debility apparently remains. But in a short time, an exacerbation supervenes. The disease acquires a renovated force, and shews itself under quite a different aspect. A new train of symptoms assail, with the greatest violence, the epigastric region. The sense of anxiety at the precordia is now changed into acute pain, which is greatly aggravated by pressure—the redness of the eyes changes into yellowness—the countenance is sunk—the tongue is brown, and trembles immoderately when attempted to be thrust out—the pulse is rapid and weak—all desire for food or drink vanishes—there is perpetual vomiting of putrid bile—the precordia are exceedingly oppressed—the patient sighs frequently—the stools are liquid—fœtid—slimy, and often bloody. The whole body is now of an intensely yellow colour [totum corpus alte flavescit.]—and emits a fœtor resembling that of putrid bile. The patient's mind is now completely collected, and he answers questions with promptness and clearness—sometimes there is a little aberration, or negligence of surrounding circumstances. From this time, that is to say, from the 5th till the 7th day, the patient is harrassed with a train of nervous symptoms, as subsultus tendinum, tremors of the whole body, &c. which tend to exhaust the strength. With pain in the abdomen, there is difficulty of swallowing, and a sense of ulceration in the fauces, with vomiting of a glairy, or black matter resembling

the *grounds of Coffee.* [Nec non vomitus materiæ glutinosæ nigræque, *fecibus choavæ* similis.] Pain about the pubes, and inability to make water—a dangerous symptom.*

In many cases, we observed swelling and suppuration of the parotid glands, with petechiæ before death. In others, there were discharges of blood from the nostrils, gums, fauces, &c. In others still, instead of gastric irritability, we had Diarrhœa, with discharges of black fluid, which occasioned great tormina, and rapidly prostrated the patient's strength. The face, which lately exhibited a yellowish or livid appearance, now became tumefied—the eyes lost all expression, and became glassy—the pupils dilated—clammy sweats broke out unequally over the body—the tongue and gums turned quite black—the breathing became more difficult—the anxiety more distressing. From this time, coma or delirium, with coldness of the extremities and intermitting pulse took place; and convulsions terminated the scene, from the 5th till the 8th day—sometimes sooner, sometimes later than this period.

All the above symptoms were not apparent in the same person, nor ran an equally rapid course. In the young, strong, and plethoric, the march was more violent and hurried—in the elderly and enfeebled the disease was infinitely milder.—Turbid urine letting fall a copious sediment—discharge of bilious stools, at first black, afterwards yellow and copious, were favourable symptoms. When the disease continued beyond the usual time, and especially if the skin kept its yellow tinge, the liver was almost always affected. Relapses were not unfrequent, particularly if great attention was not paid to a restricted diet during convalescence.

Ætiology.—Intense heat, which, during the summer months, prevails without intermission in Mahon harbour, where a breeze seldom ruffles the surface of the water—violent exercise in the open sun—Intemperance of every kind, in which sailors, on getting ashore, so unguardedly indulge—exposure to the night air, or to dews, wet, or cold, after the body had been heated; these were the principal exciting causes that gave activity to VEGETO-ANIMAL EXHALATIONS

* The above authentic document drawn up by a gentleman of great talent and observation, at the bed side of sickness, must remove all doubt relative to the existence of yellow fever in the Mediterranean; while the Section on Endemic of Batavia must have convinced the most sceptical that the same disease appears in the Eastern world, modified of course by climate, constitution, and cause. Compare this description with Mr. Amiel's account of the Gibraltar Fever.

which issue in profusion from the harbour and vicinity of MAHON.

This port, so destructive to the health of belligerent seamen, is situated low, and the surrounding sea is so tranquil, and the tides so imperceptible, that whatever is thrown into the water remains almost always in the same spot. Now when we consider the quantities of putrefying animal and vegetable substances that are daily launched into the harbour, or exposed to a tropical heat on its shores; and couple these circumstances with the *stagnant* state of the water itself, during the summer and autumn months; and moreover, when we observe a pretty extensive lake in the vicinity of the port, which, in winter, is filled by rains and springs, but in summer exposes its half-dried, slimy bottom to the sun, whence pestiferous effluvia incessantly emanate [prope portum adest lacus, qui hieme ex aquis pluviis ac fontanis constat; sed estate fere arescit, et limosam massam putrescentem relinquit, ex qua pestifera effluvia haud cessant emanare] we cannot be at a loss for the generation of those *morbific miasms*, which, in all hot climates and similar situations, give origin to fevers analogous to the one under consideration.

Prognosis: Favourable.—Little, or only mucous vomiting at the beginning of the second stage—moist skin—slow advance of the yellow suffusion—bowels becoming loose, with bilious stools—integrity of the nervous system and its functions.

Unfavourable.—Early accession of the yellow suffusion—deepness of its tint—early disturbance of the sensorial functions—deep redness of the face—dullness of the eyes—laborious respiration—feeble, creeping, and intermitting pulse—difficulty of swallowing—great tremour of the tongue—involuntary discharge of fœces, especially of a black, liquid quality—-incessant vomiting of dark coloured matters, and great in proportion to the fluid swallowed—-much anxiety.

Post Mortem Appearances.—The vessels of the brain much distended—coverings not rarely inflamed—depositions of coagulable lymph between the convolutions—adhesions occasionally between the hemispheres—ventricles sometimes distended with limpid or yellow lymph—*lungs* sometimes inflamed, with adhesions or effusions—pericardium inflamed, with more than usual water in its cavity. Diaphragm often inflamed, with coats of coagulable lymph. Liver, in most instances, enlarged—often inflamed, with its inferior margin

livid—Gall-bladder distended with viscid bile. Stomach and intestines often inflamed, and the villous coat of a dark colour.

These appearances, like the symptoms, were not all found in the same person, or together. In some dissections we found one set of organs, in others another, bearing the marks of disorganizing action. In general, however, the brain and lungs seemed to bear the greatest onus of disease.

Consilia Medendi.—The disease naturally divided itself into two stages—the first of re-action; the second of collapse. In the first stage the object was to moderate or repress the violence of re-action; in the second, to obviate symptoms, and support the energies of nature.

1*st Stage.*—Venesection is here our sheet anchor. No man can lay down a rule of *quantity*. Blood must be drawn till the symptoms are signally mitigated, whether at twice, thrice, or four times in the day. I do not think it of much consequence from what part of the body the blood be drawn. Some prefer the arm, some the jugular vein, others the temporal artery. To alleviate the head-ache, I think I have found arteriotomy at the temples most powerful. But the vascular system must be promptly, and well depleted, through whatever outlet the current flows, otherwise some texture or organization will give way, and then the chances of recovery are faint indeed.

Mean time the head is to be shaved, and kept constantly enveloped with cloths wetted with the coldest water. This is an important measure, which should never be neglected. In my own person I experienced its good effects, in soothing the pain—diminishing the heat—and tranquillizing the irritability of the system.*

Purgatives. Our next step is to open the bowels, which indeed must be done through the whole course of the disease. For this purpose, and also to correct the vitiated secretions of the intestinal canal and liver, I have exhibited eight or ten grains of calomel every four hours, without ever observing any bad consequences from hypercatharsis. In every case where ptyalism came on, the patient convalesced—the stools became natural, and the tongue clean—"In omni casu in quo (hyd-submur) salivam movit, æger plerumque

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* Dr. Boyd nearly perished under this fever himself; but was saved by profuse bleeding. Dr. Denmark states that Dr. B. caught the fever from one of his patients. *Med. Chir. Trans. vol. vi. p.* 301.

convaluit, naturales fiunt fœces, lingua nitida, ac humida." A cooling regimen is, of course, to be rigidly observed. The cold affusions and spongings are also valuable auxiliaries; and where the re-action is not in a salutary degree, and the interior organs appear oppressed—tepid affusions will be necessary.

To relieve local symptoms—leeches to the temples, or cupping may be employed when general bleeding dare not be ventured on. Blisters also to the head—neck—spine—or precordial region must be had recourse to. In cases of great collapse and deficiency of the *vis vitæ*, the tepid bath will prove an important measure in drawing the circulation to the surface. The abdomen and extremities may also be fomented often as a substitute, or auxiliary to the bath.

Finally, when all danger of inflammation or congestion is over—and where great irritability of the heart and nervous system prevails, Opiates may be administered, and with great solace to the feelings of the patient.

In the *second* stage, the great difficulty is to restrain the vomiting. Fomentations to the epigastric region are here useful, with opium, æther, and camphor internally—to which means must be added blisters. Effervescing draughts with small doses of tinct. opii. ether, infusion of calumba, may be tried, and even hot wine with spices—or brandy and water. Glysters with laudanum will sometimes restrain the gastric irritability; and I have frequently given, where the strength was much exhausted, 30 or 40 drops of spirit of turpentine every two hours, with great advantage. Where stimulants are necessary at the close of the disease, port wine cautiously administered is the most grateful. Quassia and porter in small quantities during convalescence. But a constant attention should be paid lest the patient take too much food, which will readily induce a relapse.

We shall conclude this section with a few short extracts from Dr. Denmark's paper on the same fever. "A case of this fever will seldom occur wherein the use of the lancet, more or less, will not be applicable. But this powerful remedy is not in all cases infallible. The danger consists in either applying it too late, or too often; and the abstraction of blood, under my own direction, has accelerated the patient's death, when circumstances seemed to justify the measure."

"I shall now say a few words on Mercury, our "sheet-anchor" in affections where the biliary organs are implicated.

Viewed in any way, the utility of mercury is incontrovertible, Calomel is beneficial in whatever way it operates. Whether it produce catharsis, when exhibited with a view to salivate; or salivate, when intended to act as a cathartic, the result, in either case, will be salutary, though perhaps not to the same extent. I have prescribed it in various forms, in order to fulfil both these intentions, and the result has enabled me to speak most favourably of it. I have frequently recommended calomel in three grain doses, with as much pulv. antim. every three or four hours. The antimony seemed to assist the purgative operation of the calomel, and seldom failed to procure copious bilious stools, without creating nausea. In the treatment of this fever, however, I usually gave the calomel *in scruple doses* twice a day, in many cases from the first invasion of the complaint, with the intention of speedily attacking the disease, through the system. But in this I commonly failed during the first days, in plethoric habits. Before the system was lowered, it evinced no effect through the medium of the circulation—it only kept the bowels clear. But after the lapse of two or three days, and the use of free venesection and purging; and at an earlier period in debilitated subjects, and in cases of relapse, the mouth often became suddenly sore with profuse ptyalism, and rapid convalescence as certainly ensued. I do not recollect any deaths after the specific action of the mercury shewed itself; nor did the yellow suffusion occur after this symptom appeared." *Med. Chir. Trans. vol. vi. p.* 307.

I trust that this document will prove a standard record and faithful picture of the MINORCA FEVER, as long as that Island offers a commercial port, or belligerent rendezvous to the naval flag of Great Britain.

MALARIA OF ITALY.

M. REGAUD DE L'ISLE, ON MALARIA.

(Translated from a Memoir lately read before the Royal Academy of Sciences, at Paris.)

SEC. VII. As it was in the states of the Pope, says M. Rigaud de l'Isle, and principally in the *Compagna di Roma* that I had occasion to make these observations in 1810 and 1811, I shall first give a general idea of the country, which will render what is to follow more intelligible.

Rome is situated amidst a long series of naked plains, bounded on the East by the chain of the Appennines, on the West by the sea, on the South and North by groups of mountains, which stand detached from the great chain. A first plane, composed of lands formed by alluvion, very low and often inundated, extends along the coast, which runs north-west and south-east; a great number of small rivers have here their mouths, which are encumbered with mud and sand; and here also are found extensive ponds of salt water and immense marshes.

Immediately adjoining, and in the same direction, is seen a second plane of volcanic soil, forming a great number of platforms, the undulating surface of which is intersected by ravines and narrow valleys, whence waters, almost always sulphurous and stinking, discharge themselves. The craters from which these immense accumulations of volcanic matter were vomited, are almost all now transformed into lakes, the banks of which are partly marshy. A third zone, perfectly distinct from the two former, borders upon the mountains; it is composed of calcareous hills, riven by a multitude of torrents, which precipitate themselves into the Tiber. The valley in which that river flows at first runs in the general direction of the hills and platforms, but afterwards cuts across them. It is very deep, with a level bottom, and but little inclination; neglected arms of the river, a great number of canals and ditches filled with stagnant waters, and pools, left by inundations, render it a very unwholesome abode; and accordingly very few houses are to be seen here.

Some insulated groups, some mountains detached from the great chain rise here and there amidst these plains, most of them abruptly and without gradation. Such are the insulated rock of St. Orestes;* Mount Circello, formerly the Island of Circe, to the south-west of the Pontine marshes; the volcanic peaks of Viterbo, Monterossi, Monte Cavo, formerly the *Mons Albanus*, forming part of the group of Artemisio. Between these last, for a space of many hundred square miles, the country is bare and destitute of trees; but in many other parts it is planted, wooded, cultivated and covered with forests as much or more than any other tract of the globe.

From this peculiar disposition of the places in the *Compagna di Roma* it results, that we may there compare in a

* *Candidus Soracte*, thus named from the white calcareous cliffs on its summit.

few hours what otherwise we might go very far in quest of, and not find again under similar circumstances. It is, therefore singularly favourable for such researches as the present. Here, beside low and moist plains, we find others that are elevated and dry, overgrown with wood or bare of trees; in one place a considerable population; in another scarcely a single human inhabitant; narrow valleys; sheltered, or elevated and exposed situations; houses perched upon pointed rocks, and others immediately at their base; every variety of soil; stagnant waters—and all these as it were in one common atmosphere, subject to the same winds and the same influences of temperature, seasons, and unwholesome air.

Let us suppose an observer placed upon the coast; he considers the inhabitants; he sees them in summer, and more particularly in autumn, with a livid tint, shining skin, the abdomen distended, a lounging listless gait, mostly afflicted with putrid and malignant fevers. He directs his course to one of those elevated rocks which I have described; he ascends, and as he rises, he finds no other fever than the simple intermittent; by degrees this also disappears; he meets with no faces but what exhibit a ruddy glow, and all the appearances of health and vigour.

Which way soever he turns the same phenomena present themselves: in every quarter diseases pursue the inhabitants of the plain, and spare those of lofty situations: hence he cannot help inferring that the bad air does not rise so high as the latter, and that it must therefore possess a greater specific gravity than the ordinary atmospheric air. He will seek the point at which it ceases to manifest itself, and trace the limits that are assigned to it; and if for some days there has prevailed one of those impetuous winds, to which is ascribed the most baneful and the most speedy influence upon health; if not only those who inhabit the summit of the mountain, but also those at its foot, who happen to dwell on the contrary side, do not appear to have felt its bad effects; if, moreover, a forest, a high wall, a mere canvass has screened them from those effects, our observer will again be naturally led to infer that the cause of the insalubrity of these winds is purely accidental; he will seek to discover how they may have been divested of it in passing through the trees of a forest, or breaking against any other obstacle. He will then certainly not be able to repress some rational doubts on the justice of the opinion which pronounces bad air to be a substance similar to our known permanent gases;

for it will appear absolutely impossible to him that a gas could have been thus stopped, sifted, strained, and deposited. He will make a comparison, coarse it is true, but accurate; these winds will seem to him to transport deleterious miasmata as they transport dust; the heaviest particles fall or are carried down to the lowest strata; the others are deposited against the obstacles opposed to the direction of the currents.

Observations quite as easily made suggested to me reflections and experiments from which I have deduced the following inferences:—

1.—Miasmata possess such a gravity that they can never rise in the atmosphere, unless assisted by a lighter body, which carries them into it.

2.—They have no perceptible smell, and may be separated from such odours with which they may be accidentally associated.

3.—It is aqueous vapours that hold them suspended in the atmosphere.

4.—Various obstacles form barriers which they cannot pass, and against which they deposit themselves.

Section 1.—The air which is very unhealthy at Montalto, Corneto, and along all that coast, stretching to the south as far as Terracina, becomes salubrious on Mount Argental, which rises above Orbitello. The villages of la Tolfa and the habitations situated above Civita Vecchia on the Cimic hills, afford a very agreeable and healthy abode, though situated in the centre of that region of desolation. The same is the case when we rise above the village of St. Felice, on the mountain of Circe; to the palace of Theodoric, above Terracina; to the villages of Sezza and Sermoneta, perched perpendicularly above the Pontine marshes, on the rocks of the Lepine mountains; also at Monte Fiascone, above the lake of Bolsena, above the villages of Valentano, Capo di Monte, Martha, &c.

A little farther eastward, on the insulated rock of St. Orestes, the inhabitants of the village which is built on its side, invariably enjoy the best health; if they descend, disease attacks them, and common fevers make their appearance; a little lower down, for instance at Sandreva, they will have putrid fevers; and still lower down, at Borghetto, they will die. Cross the river, ascend to Magliano, a little higher to Otricoli, still higher to Narni, you will find the air again improve as you proceed. At the time of the erection of the bridge of Felice, in order to unite

all the waters of the river, Sixtus V. was obliged to divert a branch of the Tiber which passed below the hills of Magliano, leaving to time the task of filling up the old bed: half of the population perished; one single convent of nuns, in which I lodged, contained 69 sisters, including novices, of whom 63 died in two years.

All the declivities, calcareous on the left, and volcanic on the right of the valley of the Tiber, are cultivated and planted with olives or vines. The villages here are all situated on elevated points, and the health of the inhabitants is always in proportion to their height above the bed of the river, without any distinction whatever as to the nature of the soil, the culture, the quality of their waters, or their population.* During great part of the year thick fogs gather every night in the bottom of this valley, and, as it were, transform it into a vast lake. All the surrounding villages, mostly built upon peaks, doubtless to protect them from the bad air, have the appearance of islands; and it is a curious sight at sun-rise to view some of them immersed, so as to show only a few points, others entirely clear, bespeaking with equal certainty their respective degrees of elevation, as well as the degree of salubrity of the air breathed in each.

Monte Mario, which adjoins to Rome, and shares all the insalubrity of the neighbouring country, is, according to Breyslack, 143 yards above the level of the sea. Tivoli, which, according to the same writer, has an elevation of 208 yards, is infinitely more healthy. According to very accurate measurements, communicated by M. de Prony, Sezza, whose inhabitants seem upon the whole out of the reach of the bad air, is 306 yards above the Pontine marshes. The village of St. Felice, on the mountain of Circe, on the other side of the marshes, which is only 114 yards, and still lower down the environs of Terracina, which is 38 yards, are more and more exposed to the malignant influence of the miasmata that rise from them. It would seem, therefore, that the limit to which they are confined, is somewhere between 208 and 306 yards above the level of the places from which the poison issues: but I have reason to believe that it cannot be fixed in an absolute manner, and that it varies from year to year according to the heat, the wind that blows, and also the intensity and duration of both.

Velletri, for example, which is 56 yards higher than Sezza, seems to me to be more exposed to the diseases arising from

*This remark is designed to answer those who attribute insalubrity sometimes to the absence, and at others to the presence, of one or other of these circumstances.

bad air than the latter place. Such at least is the result of the information which I collected on the spot, and which I believe to be accurate. The cause is probably this:—Sezza is seated immediately above the marshes, upon a rock, against which the west winds, charged with miasmata, break in their course: and Velletri, on the contrary, being situated to the north of those marshes, on hills rising with a gradual ascent, the south winds are carried thither, without encountering any obstacle excepting woods and forests, where there are any.

It is necessary also to pay regard to the relative height of the place which is the focus of the infection; for if it is situated on a mountain (like the pond of Col Fiorito, above Foligno, on the declivity of the Appennines), the air there is more rarefied, the barometer stands much lower, and the miasmata will not, of course, be carried to the same height.

The observations of some eminent travellers support this remark. According to M. Von Humboldt,* the farm of Encero, situated above Vera Cruz, is not affected by the insalubrity which prevails all along that coast; and he elsewhere states that the marshy lakes situated in the elevated valleys of the Corderillas of Mexico cause frequent and fatal epidemics.

M. de Volney says the same concerning Syria. The latter and M. de la Rochefoucalt relate similar facts, and speak in like manner of the greater salubrity of the air upon the mountains of the United States, and also of the unhealthiness of the elevated plains which surround the great lakes of North America.

M. Von Humboldt also gives us the elevation of the farm of Encero, 928 yards, as the highest limit of the yellow fever, and the lowest limit of the vegetation of the oak.

Section II.—*Miasmata have no smell by which they can be distinguished. They may be separated from the odorous substances with which they seem to be most intimately blended. I mean not to assert that a disagreeable smell does not frequently accompany air charged with deleterious miasmata; that the circumstances of their production may not often be the same, and that the sensation of the one does not render probable that of the other; but they must, nevertheless, not be confounded.*

There are few persons but know and dread the peculiar odour emitted by stagnant waters; it has something disagreeable and sickly, which seems to warn us not to approach places where

* Essai politique sur la Nouvelle Espagne, T. iv. p. 524.

it is perceived; it may, however, be inhaled without any ill effect in certain seasons of the year. I have myself been several times exposed to it, and not I alone. In 1810 and 1811, in passing the numerous ponds which cover the sea coast of the Ecclesiastical State, at Maccharese, Ostia, Foligнano, in the Pontine Marshes, which I have repeatedly traversed in various directions, I have always perceived this peculiar smell, without sustaining any inconvenience from it. The following year, on the contrary, on a very hot day in the beginning of September, among the ponds of Vauvert, between St. Giles and Aignes Mortes, in Languedoc, I was suddenly seized with nausea and a feeling of sickness, which lasted several days, though I remarked, at the time, that no kind of odour was emitted by the marsh.

Some time afterwards, in the same place, the wind blowing from the south-south-east, and passing over parts of the ponds which were half dry, brought with it a very strong and disagreeable smell, that penetrated through the doors and windows, though we paid the greatest attention to keep them closely shut, filled the whole house, and yet occasioned no farther inconvenience to my assistant and myself, than the unpleasant impression which it produced on the olfactory organs; yet its arrival, or, more properly speaking, its passage, was marked all around us by a great number of new patients and new fevers. Since we found means to escape disease, though we could not preserve ourselves from the bad smell, it is evident that these two things were not identical, and that a separation of them had taken place. The principle of insalubrity did not penetrate into the house, while that of the bad smell gained a free passage.

The most offensive quarters of a city are sometimes the most healthy: in some countries, on the other hand, in a climate apparently more pure, in moments when we inhale, as we think, an air embalmed with the perfumes of plants, this fresher air of a fine evening or morning, which seems so agreeable, is in reality a poison, against which there is nothing to put us on our guard.

Dr. Valentin expressly says, that "the atmosphere is sometimes charged with deleterious and destructive miasmata, when the smell can distinguish no quality in it, and the respiration is not in the least affected."*

Section III. *It is much more dangerous to inhale bad air*

* *Traité sur la Fièvre jaune d'Amerique*, 8vo.

in the night than in the day time. All the hours of the day or of the night are not attended with equal risk. The least critical moment is when the heat is greatest, and the sun highest above the horizon. The most dangerous is that which accompanies the setting, and that which precedes the rising of the sun.

This observation, which applies to all times and to all places, proves to demonstration the union of miasmata and aqueous vapours; the former are heavy, the latter, possessing extreme levity and dilatability, lend them wings: it has been found that they hold even particles of sea-salt in suspension.* Rarefied in the middle of the day by the heat, the more elastic and lighter vapours must then occupy more space in the atmosphere; the miasmata which they carry with them, must also be at such times more widely diffused; we do not, therefore, then inhale them in such large doses in the same volume of air, and consequently cannot, in those hours, be so much affected by them.

But if the heat decreases, the vapours become condensed, and fall; the deleterious particles swept along with them sink to the lower strata of the atmosphere, and there accumulate; they keep their station there during the night: others continue to descend, and sun-rise, which is usually marked by a sensible refrigeration of the air, will also be attended with a fresh precipitation of vapours which will render that moment still more critical.

The evening dew is so much dreaded at Rome, that as soon as it begins to be perceived, all the inhabitants shut themselves up in their houses; but the moment this first and copious precipitation of vapour, which generally accompanies the close of a hot day, seems to be over, they all sally forth, again, and the streets are more crowded than ever.—The dew has always been considered as extremely pernicious in countries where bad air is generated; experience has, in like manner, taught their inhabitants to defend themselves from the damp of night, and especially from the coolness of the morning. The people of Italy, and I suppose of all countries where the air is bad, never go abroad, unless absolutely obliged, till after sun-rise, when the heat has dispersed the pernicious vapours that have fallen during the night.†

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* Vide page 63 of this Essay.

† These statements strongly corroborate the observations which I made many years ago on this subject—especially on the fall of febrific miasmata with the dews.—*Vide Sec.* 1. *Eastern Hemisphere, page* 62.

Hence we see that the mass of deleterious miasmata which vitiate the air, must be perpetually varying in the lower strata of our atmosphere; that a certain accumulation of them must take place before they can be really pernicious to health, and occasion very dangerous diseases.

Hence also we learn the reason why low places are much more unwholesome than others situated close by them, but somewhat higher: the air, charged with miasmata, flows, in a manner, from all the neighbouring declivities, borne down by its gravity. Hence it is that the defiles of Ardea are uninhabitable.

For the same reason it is dangerous to sleep upon the ground in unhealthy situations. More than one instance has occurred at Rome of persons who have lain down in such places to sleep, and never risen again: the lower you are, the denser are the strata of miasmata. Soldiers are obliged to bivouack in all situations indiscriminately, and to pass whole nights in the open air; and thus it is that the finest armies are frequently reduced and dissolved in a short time.

Hence also most assuredly arise those very perceptible differences between the air of the valleys and that of the surrounding eminences; and between the air of the valleys and that of the open plains, even when that of the former cannot be considered as unhealthy. If the elevated strata let fall their miasmata, it is to infect the lower with them: whatever they may be, they are carried to the bottom of these funnels; and it is obvious that great plains, not surrounded by higher grounds, are not subject to this disadvantage. Whence proceeds this extreme difference? Not from a greater proportion of eminently respirable air—not from a greater proportion of oxygen, as once imagined; but it depends on certain atoms which have hitherto escaped our best eudiometers.

It is obvious that every sudden, rapid, and considerable change in the temperature of the air, or merely the crossing of two winds, the one hot and the other cold, may be very dangerous to health, if the atmosphere of one of them is charged with miasmata. Accordingly, the season in which these sudden variations are most frequent, particularly autumn, when the days are still warm and the nights cold, will be the most critical of the year, and not cease to be so, till the cold, checking the formation of the miasmata and the supervening rains, shall have purified the atmosphere, and renewed the water of the ponds and marshes.

I have shewn that the aqueous vapours part from the miasmata which they have carried away as soon as they attain

an elevation at which their combined weight surpasses that of the atmospheric air. We have seen that these miasmata are much less subtle than the air, or than the principle of smells; since air and odorous effluvia penetrate into every place, whereas miasmata are stopped and expelled by various obstacles.

Section IV.—*The interposition of a forest, a mountain, a high wall, or even of a mere cloth, may also co-operate in this separation, and preserve us, in a variety of circumstances, from the pernicious effects of the air charged with deleterious miasmata.*

Upon Mount Argentel, above the village of St. Stephano, there is a convent which has lost all the reputation for salubrity which it once enjoyed, since the lofty trees by which it was surrounded have been cut down.

I have been informed by persons worthy of credit, that in consequence of the felling of the wood before Asterna, near the Pontine Marshes, Veletri was visited for three successive years by diseases which made much greater havoc than usual throughout the whole country, and penetrated to many places which they had not previously been accustomed to reach.

I have seen poor fishermen who had taken up their abode near the canal which runs from Campo Salino to the sea; they had built their hut close to a wood that skreened them from the direct access of the infected winds which pass over that morass; and declared that they never suffered any inconvenience from them so long as they remained under that shelter.

Volney states a very remarkable fact relative to this subject. "Bairaut," says he, "formerly very unhealthy, has ceased to be so since the Emir Fakr-el-din planted a wood of fir trees, which still exists, a league below the town. The Monks of Marh-anha, who are not systematic natural philosophers, have made the same observation respecting different convents.

Lancisi, a physician of sound judgment and veracity, cites a great number of examples which prove the utility of woods situated between the inhabited places and marshes; and several that demonstrate the dangers resulting from the destruction of them.*

* He asserts, in one of his works, that the consecration of woods and groves had originally no other motive than this.

Bapt. Donus, in his work, *De restituenda Salubritate Agri Romani* (1667), recommends the planting of pines and other trees between Rome and the Pontine Marshes, to intercept the miasmata wafted from them by the south-west winds.

About the end of 1810, I was at Civita Vecchia. Passing through St. John's Place, which is a pretty regular square, I was shewn one whole side where the inhabitants had been much afflicted with diseases occasioned by bad air, while those on the opposite side had almost all escaped. What could be the cause of such an extraordinary difference between houses so near to one another? Dr. Nucy an intelligent physician, pointed out to us that the former faced the south, so as to receive directly the south-east winds which arrive saturated with miasmata from the marshes on the coast.—The latter, on the contrary, which fronted the others, received those winds only in an indirect manner and by reflection.—When those winds blew they were certainly inhaled by all the inhabitants of the place alike, so that there could he no other difference between them in this respect than that which has just been mentioned.*

I passed some time afterwards through Nettuno, a small town likewise situated on the coast between Capes Antium and Astura, not far from the Pontine Marshes and still nearer to those of Foce verde, Folignano, &c. A striking difference was perceptible between the look of the inhabitants of the town itself, and those of the suburbs; a very great proportion of the latter appeared pale and sickly.—I was puzzled to account for this circumstance, when the mayor desired me to observe that the town was much nearer to the sea; that it was surrounded with high walls, and that its streets were narrow and crooked; on the other hand, the few houses forming the suburbs, standing farther inland, were more exposed to the winds, and had nothing to shelter them from their influence.† Very near this place, in the gulf of Astura, ancient buildings or ruins are to be seen at the bottom of the water.—From Nettuno to Antium, and considerably beyond it, other buildings of considerable magnitude are observed standing close against the foot of the rocks that project into the sea. When

* The following fact is of much higher antiquity but not less striking:—Hic Varo noster cum Corciræ esset, exercitus ac classis et omnes domus repletæ essent ægrotis ac funeribus, emisso fænestris novis acquilone, et obstructis pestilentibus, januaque permutata cæteraque ejus generis diligentia, suos comites ac familiam incolumes reduxit.—Varo de Re rustica lib. I.

† The subjoined passage also proves that the Romans had discovered this effect of narrow and crooked streets. On occasion of the burning and rebuilding of Rome by the Emperor Nero, Tacitus says: Ex ea utilitate accepta, decorem quoque urbi attulere; erant tamen qui crederent veterem illam formam salubritatem magis conduxisse quoniam angustia itinerum et altitudo non perinde solis vapore perrumperentur, ac nunc patulam latitudinem et nulla umbra defensam graviore æstu ardescere.—(Ann. *lib.* XV.)

we consider that a great number of ponds and morasses rendered this whole coast unhealthy, we are at a loss to conceive how edifices of such importance could have been erected in such situations; but we ought to recollect that as the Romans had upon this coast ports which were much frequented, and at which great part of their commerce was carried on, so it was absolutely necessary for them to reside there. They were consequently obliged to seek the means of preserving themselves from this insalubrity. Now by building upon the beach, close against the rock, they were skreened from the unwholesome land winds, and received none but the sea-breezes, from which they had nothing to fear. The fishermen who keep constantly upon the water, at a certain distance from this coast are never incommoded by the bad air.

In the gulf of Pazzuoli I met with a great number of other edifices of the same kind, built close against volcanic rocks which run out into the sea; their foundations also are under water, and this situation was probably selected on account of the same circumstances, for on the other side, immediately behind these rocks were, and still are, very extensive insalubrious marshes.

In one of the most unhealthy corners of the Pontine marshes I found a man who had for several years been employed there in making charcoal from turf. During this period he had never been afflicted with any disease, and when questioned respecting a circumstance so very extraordinary in such a place, he ascribed the preservation of his health to the following precautions. He made a particular point of returning by sun-set to his hut, where he kept a continual fire; he never left it again till late in the morning, and remained near his furnaces in the day-time. It is obvious that the miasmata either did not penetrate into his hut, or if they did, the vapours combined with them were rarefied by the heat of the fire, and carried off by the currents of air which this fire incessantly produced. In the day-time the exhalations were dilated by the heat, and repelled by the smoke of the furnaces about which he was engaged. This man so well instructed by experience, had a florid complexion, and a totally different look from the people of the country, who, taking no precautions, are annually exposed to a mortal disease, and generally drag on a truly pitiable existence.

During my residence near the marshes of Languedoc, I lived near a very fine building, formerly the convent of Franquevaux, erected on the very border of the marshes. The

monks in this house were perfectly healthy all the year round, though few of the inhabitants of the environs escaped disease in summer or autumn. Tradition nevertheless relates that they were accustomed in hot weather to sup on a terrace contiguous to the convent—a sure method of exposing themselves to disorders; but they were sheltered by a tent of double or triple canvas, and this simple precaution, requisite against the musquitoes, proved, unknown to them, a still more certain protection against miasmata.

How often has it been observed at Rome that many of the convents of that city are not exposed to the bad air, and that those religious who never went abroad were invariably exempted from the diseases which it occasions! In certain hospitals there are healthy wards by the side of unhealthy ones. Dr. Michel, who has long practised physic at Rome, mentions those that are to the south and south-east as insalubrious in the hospital of St. Spirito which is otherwise reputed to be very healthy.

The malefactors confined in the prisons of the same capital never contract there the diseases which make such havoc every where else. Volney has a similar observation respecting the prisons of Philadelphia into which the yellow fever was never known to penetrate; indeed he ascribes this effect to sobriety, temperance, and cleanliness; but these qualities cannot be attributed to the prisons of Rome. The inmates, however, are equally protected from prevailing epidemics, so that some other more efficacious and more immediate cause must operate unknown to us. This cause, which an attentive examination of the properties of miasmata has unfolded to us, is seclusion.

Seclusion, so successfully practised, in cases of contagion, *may be employed with equal benefit in case of the mildest epidemic fevers*. It affords you a not less salutary defence against the slightest indisposition, a cold in the head, than against the most dangerous diseases. The very same preservative means by which you may protect yourself from the most serious and fatal disorders are efficacious in defending you from fever in its mildest form.

If I had to direct the inhabitants of a town attacked with alarming epidemic disease, I would not enter into any discussion of the causes that produce or propagate the contagion; I would let all the precautions adopted in such cases remain as I found them; I would not attack any opinion or any prejudice; I would not meddle with any of the measures tending

to allay the public anxiety and alarm; but if the evil were very urgent, if there were already a patient in every house, I should not think of removing them for fear of the farther spreading of the disease within; but I would immediately enjoin the general seclusion of all the citizens; I would enforce the order by the point of the bayonet; and till the purity of the atmosphere should appear to me to be completely restored, public functionaries should supply the wants of the inhabitants, and keep up such communications as are indispensably necessary.

In 1720, when the plague raged at Marseilles, M. de Vauveneargue, governor of Aix, to which town it had already penetrated "despairing," (says M. Papon in his *Histoire generale de Provence*) "to arrest the progress of the disease, by the ordinary remedies, proposed to the minister to put all the inhabitants under quarantine in their houses. *No sooner had the quarantine begun than the disease considerably abated*, and there were scarcely any sick when it was taken off. Joy and liberty were then restored to the citizens, but a relapse *the causes of which are not known*," says the historian, "soon disturbed the public tranquillity. The *quarantine was renewed* with the same strictness as before, and the *contagion entirely disappeared* before it was over. From an unaccountable, prejudice," adds M. Papon, "the physicians whom the king had sent to Marseilles, asserted that the disease was not contagious."

I would order such of the citizens as were not absolutely obliged by their business, not to go abroad till long after sunrise, and to return home a little before sun-set. For workmen habitually employed in the open air, and soldiers who must be at their post day and night, I would devise some simple thing or other to be placed before the organs of respiration, so as to intercept the insalubrious particles mingled with the air they breathe. This might be a piece of fine cloth or gauze, in one or more folds, and I would fasten it over the face, because I have reason to think that it is upon the pituitary membrane in particular that miasmata settle and accumulate by consequence of the repeated movements of respiration. Frictions with oil, where there is no denudation, excoriation, or wound of the skin, seem to me to be of very little benefit.

With some alterations easily made, still more easily conceived, and by no means expensive, if directed with intelligence, I would have a hospital, a prison, or even a house situated in the midst of the most unhealthy tract of country,

so contrived that their inhabitants should have nothing at all to fear from the air they would breathe, so long as they kept at home. I would leave lateral apertures, but which should admit light alone; the air should not reach them except by winding channels, and after it had been filtered: it should have no outlet but by large vent-holes in the roof, and it should be expelled through them by the very nature of the properties of that element, in which variations of temperature produce perpetual currents.

SICILY.

"Jamque in conspectu Siculæ telluris."

Sec. VIII.—The climate of Sicily is always oppressively hot in summer, and seldom very cold in winter. Between April and August there is little or no rain; towards the end of the latter month the rains begin, but the heat continues till the middle of September, when it rapidly declines. From November till May, the heat is moderate, the mercury ranging from 50 up to 65 or 70°. In the summer months, and particularly in July and August, the thermometer *averages* 86 in the day, and is but a very few degrees less in the night. Sudden vicissitudes of temperature, however, are considerable —20 or 30 degrees in the twenty-four hours. Of course, local inflammations and congestions are common, and *phthisis pulmonalis* is frequently fatal.* Here, as in most hot climates, the houses are more calculated for counteracting heat, than resisting cold, or preserving an equilibrium of temperature. Stone floors and unfinished casements ill suit the delicate frames of the consumptive in winter; while in summer, the sensation of heat is so great, that many expose themselves to dangerous transitions rather than bear excessive warmth within doors. It is in this way, that many refer the origin of their pulmonary complaints to the most fervid season of the year. *Light* rains in autumn are observed to be unhealthy—evidently from their putting the surface of the earth in a state capable of evolving febrific effluvia; whereas, nothing is so

* Hepatitis, according to the testimony of Irvine, frequently occurs in Sicily.

salutary as *heavy* rains about the middle of September, which at once mitigate the heat and check the extrication of miasmata

Sicily is penetrated in several directions by ridges of primitive hills of considerable height: between these are numerous water courses, which are dry in summer, and occasionally filled by torrents in winter. They are designated by the Sicilians, FIUMARI, and are used as roads in the dry season. Many of them are extremely unhealthy in the latter part of summer, and in autumn, and infested by what the natives term MALARIA. The state of this *Malaria* varies much according to the state of the season. A very wet season will *overwhelm*, as it were, the sources of this febrific, while a very dry one will so parch up the surface of the earth, as to produce a similar effect. At LENTINI, however, around which, the country is marshy, with a considerable lake in the vicinity, the ground is *partly* freed from water in hot weather, but is never so dry as to prevent the formation of miasmata. Here there is a Malaria every year. In many of the *fiumares* the stream disappears in the gravel, and percolates under the surface to the ocean. Thus at the bottom of the large *fiumare* which bounds Messina on the northern side, fresh water will be found at a foot depth close to the sea. It is in these kinds of fiumares that a Malaria prevails, according to the opinion of the natives, throughout the year; and this probably accounts for the extrication of miasmata in many parts of the West Indies as well as Europe, where there are apparently no materials for their production. Thus some places in Sicily, though on very high ground, are sickly; as Ibesso or Gesso, about eight miles from Messina, situated upon some *secondary* mountains lying on the side of the primitive ridge which runs northward towards the Faro, which has always been found an unhealthy quarter for English troops. It stands very high; but still there is higher ground at some miles distance. Water is scarce here, and there is nothing like a marsh.—At this station, however, sickness seldom occurs "unless after rains falling while the ground is yet hot, that is during the heat of summer, or early in autumn, when all circumstances combine for the production of miasmata." *Irvine p. 6.* This may apply in elucidation of the Gibraltar fever. "I remember, says Dr. Irvine, a muleteer passing over the hills near Obessa, in the middle of August, during a heavy rain, who remarked that these rains falling on the heated ground would cause a stink (puzza) and that many would be poisoned." *ib.*

In Sicily the north wind is cold—the west rainy—the south-east is the celebrated Sirocco, which seems to derive its noxious qualities from heat combined with dampness.—Here, as in most sultry latitudes, the summer and autumn are the unhealthy seasons.

The fevers of Sicily have been divided into three classes, those of summer, autumn, and winter. Those of summer have appeared to Irvine, Boyle, and others, to be of an inflammatory nature—to be principally owing to excessive heat—intemperance, and inordinate exercise. The head seems to bear the onus of disease. Dr. Irvine bled from the temporal artery, repeating the operation *pro re nata*. Blisters were applied to the head, and purgatives were administered internally. The cold affusion was then applied on the principles of Dr. Currie. "I never, says Dr. Irvine, in any one instance, saw the bleeding fail to remove the pain of the head, and when delirium was present, it lessened also that." 24. "Encouraged by the alleviation of the symptoms I persisted in my plan. I bled a third time from the head, and blistered again between the scapulæ, continuing the cold affusion. The number of times that this treatment was repeated was necessarily regulated by the effect produced. I never had occasion, however, to bleed more than four times. But the standard rule of my practice was to continue the bleeding and blistering of the head while any degree of head-ache remained, or any symptom of determination to the head was visible." *ib*. Dr. Irvine found the bleeding pave the way for, and render more efficacious the cold affusion, which when applied without this preliminary, afforded only transient relief.

"The appearances on dissection were somewhat various. In some cases, nothing very remarkable could be, or was discovered in the brain or its membranes. In others the cerebral veins were turgid with blood. In many there was a red spot on the dura mater, about the middle of the longitudinal sinus, of the size of a dollar. Sometimes a little pus, or rather inflammatory exudation appeared upon this spot." *Irvine p.* 36. —"I find it difficult, says Dr. Irvine, to reconcile the facts here stated, with the ingenious opinion of Dr. Clutterbuck. I do not think that phrenitis, or any analogous disorder of the brain, often, far less always, exists in fevers." *p.* 62.

In the autumnal fevers of Sicily, a great many, when the disease was violent "became excessively yellow" without any alleviation of their disorder. The stomach is more irritable—the vomiting is bilious, and of a dark green colour—

the region of the liver sometimes tender. These run out to a much greater length than the summer fevers, but only differ from them in being accompanied with earlier prostration of strength." "I can safely state, says Dr. Irvine, that the same sort of treatment which I have used in the summer fever, also, proved successful in these." 45. Purging, however, was more necessary, and calomel and James's powder were found useful in protracted cases. "Touching the mouth with mercury is sometimes useful in cases where the yellowness is great." 47.

The winter fevers, according to Irvine, had nothing remarkable in their phenomena or progress; but ran a course analogous to the ordinary cases of Synochus in England. "They hardly ever fail to yield to the four grand means of topical bleeding [arteriotomy] blistering—cold affusion, and purging." 60.

To the above observations by Dr. Irvine, which appear, on the whole, judicious and correct, I shall add some from the pen of Mr. Boyle, who, in my opinion, has given a more rational explanation of the symptoms, while his *Methodus Medendi* is equally effective as Dr. Irvine's.

When the epidemic first appears, says Mr. Boyle, in the early part of autumn, the fever preserves nearly a continued form, and only remits after the violence of the excitement has been subdued. It bears a strong analogy to the bilious remittents of all warm climates—is closely allied to the fever which visits other points of the Mediterranean shores, and seems to differ only in degree from those great endemics which have repeatedly ravaged the western hemisphere.

"In Sicily, says Mr. Boyle, this fever usually makes its appearance about the same time that cholera morbus and other disorders of the biliary organs are known to prevail, and both diseases seem to arise from causes of nearly a similar nature. It indeed appears to be essential to the production of this fever, that a considerable diminution of temperature, accompanied with much humidity of the atmosphere, should *suddenly* succeed to the long-continued heat of summer. By those causes, an important change is effected in the *balance of the circulation*, causing an unusual determination to the abdominal viscera, and producing congestion or inflammation of the hepatic system, in various degrees, followed by an increased and vitiated secretion of bile." *Ed. Jour. vol* viii. 184.*

* The reader will not fail to perceive the coincidence of Mr. Boyle's ideas with my own, though the writers were separated by many thousand miles at the time.

The succession and order of the symptoms, marking the different stages and types of this fever, will be readily explained by the appearances on dissection, and seem to depend chiefly on the degree of inflammation, and the sensibility of the part concerned. When the liver is very violently affected, the symptoms sometimes even resemble those of hepatitis, and which more especially appear at the commencement of the fever; and inflammation of the stomach is sufficiently characterized by the anxiety, restlessness, vomiting, and prostration of strength, which immediately follow.

As a common consequence of extensive peritoneal inflammation, we sometimes find a quantity of serum effused into the cavity of the abdomen, and various adhesions formed between its parietes and the contained viscera; and the omentum at other times so much wasted, as to resemble merely a tissue of red vessels. The liver almost always exceeds its natural size, and is also considerably altered in colour and texture. It is always softer than natural; and the system of the vena portæ is always turgid with blood. The peritoneal covering of the liver is often thickened and opaque, and is sometimes studded with white spots, or with flakes of coagulable lymph. Sometimes its surface is irregular, and small indurated portions are discovered on its convexity, which, when cut open, are found to proceed from obstruction of some ramification of its excretory ducts, produced by inflammation of its coats, and favouring the accumulation of viscid bile. —The coats of the cyst generally partake of the inflammation. The colour of the bile it contains is various, and it is sometimes so viscid and thick, that it can scarcely be forced out by strong pressure.

A remarkable alteration also takes place in the appearance of the spleen. It does not always, however, exceed the natural size, but its softness is often such, that it can only be compared to a mass of coagulated blood; while, at other times, it has an unusual degree of hardness, with thickening and whiteness of its peritoneal coat.

The stomach is frequently found contracted and empty, or inflated with air, or distended with variously coloured fluids, and even pure bile. Sometimes inflamed spots are discovered on its peritoneal coat; but the internal surface is the most frequent seat of disease. The texture of the villous coat is often completely destroyed, and it exhibits an uniform red, of the deepest hue, in several places approaching to a livid colour, and is covered with coagulable lymph, or a secretion

of puriform matter tinged with blood. In other cases, the inflammation is more limited, and appears in rosy patches over its internal surface, or in numerous minute red specks.

This inflammation is never of the phlegmonous kind, but like true erythema, successively invades one part after another, frequently creeping along the whole course of the alimentary canal, attended with thickening and pulpiness of its coats.

The brain and its membranes shew no uncommon appearances, or marks of previous inflammation.

The lungs are not affected, but I have often found a large quantity of serum, of a yellowish colour, collected in the pericardium, while the heart seemed to have suffered from inflammation; and, in two or three cases, I observed white patches of coagulable lymph, apparently converted into firm glistening membrane, easily separated from its proper coats, on different parts of its external surface.

Such, indeed, is the rapid progress of the disease, and the great delicacy of the organ principally concerned, that our measures must necessarily be prompt and vigorous; and under whatever varieties it may appear, with respect to type, the local symptoms always require our first attention, and indicate the necessity of copious evacuation of blood. If the fever be of the continued form, under such treatment it very often becomes intermittent, and when of this latter form, we thereby prevent its being changed into a more dangerous type, in the course of its progress.

From the use of this remedy, we are not always to be deterred by the smallness of the pulse; and even if deliquium should come on after the abstraction of a few ounces of blood, the operation may be repeated soon afterwards, without the occurrence of the like accident.

The indiscriminate use of the term *debility*, derived from some of the more general phenomena of disease, without regard to its essence or cause, has led into egregious error in the treatment of this, as well as of some other complaints, which are commonly considered as simple idiopathic fevers. The anxiety, languor, restlessness, and prostration of strength which accompany this epidemic, are not symptoms of debility, but of gastritis, and depend on the peculiar structure of the organ, and its extensive sympathy with the whole system. A free use of the lancet is required; and, in order that this remedy may be productive of beneficial effects, it must be had recourse to at an early period of the disease. Even when the disease was too far advanced for any permanent advantage to

be expected from venesection, its effects have been discovered by a temporary increase of fulness of the pulse. What is here said, applies equally to general and local blood-letting; and this last mode may be employed with considerable advantage.

In the inflammation of all delicate and highly sensible membranes, unless we succeed in the first instance, we in vain attempt to subdue it afterwards, by acting on the arterial system at large, and still farther diminishing the *vis á tergo:* for the disease makes rapid progress; the texture of the organ is speedily destroyed, and its vitality is irrecoverably lost.

Recourse must, therefore, at the same time, be had to such means as possess some controul over the vessels of the part, suitable to its peculiar functions and organization; and the effects of local blood-letting, by the application of a number of leeches to the region of the stomach, are to be further assisted by large and repeated blisters.

Nothing so much aggravates all the symptoms, as the presence of acrid bile, and accumulated feculent matter. All irritation, therefore, from such causes, is to be carefully prevented; and, with this view, the contents of the intestines are to be dislodged on the first approach of the disease, and their accumulation cautiously guarded against during its continuance. For this purpose, small doses of purgative medicines must be frequently administered. It too often happens, however, that the irritability of the stomach is such, that medicines of this class cannot be retained, but are instantly rejected; and recourse, therefore, must also be had to large emollient and laxative glysters, which must be frequently injected, and are in all stages of the fever, of the most essential service. As a purgative, no medicine is so well adapted to this complaint as the sub-muriate of mercury; and its operation may be sometimes advantageously alternated with the use of sulphate of magnesia dissolved in water, and plentifully diluted.

The effects of mercury, however, are not to be estimated solely by its purgative quality; but it seems to be chiefly useful, on account of its specific action on the hepatic system, and its power of affecting, through the medium of the circulation, secreting surfaces endowed with high irritability, and in a state of inflammation. This remedy is, therefore, to be used externally, as well as internally; and is to be resorted to immediately, as the most powerful remedy we possess in the treatment of this disease. Its effects, however, do not always depend on the quantity introduced; but on certain conditions

of the system, by which the latter is rendered more or less susceptible of its action, and which I do not pretend to explain.

This susceptibility is indicated by the effects produced on the salivary glands; some degree of ptyalism follows, which affords the surest prognostic of a favourable termination; and the change produced in all the symptoms is generally quick and rapid. It sometimes, however, happens, that the largest doses will not produce salivation, and, in such cases, the event is invariably fatal.

From the rapid manner in which we are frequently induced, on account of the severity of the disease, to introduce this medicine into the system, copious salivation is frequently occasioned, and often appears suddenly, with bleeding from the gums; but as no advantage is to be expected from the mere secretion from the salivary glands, I have succeeded equally well, after having ascertained its influence over the disease, by continuing its use in small doses, merely sufficient to keep up the mercurial irritation in the system, until the disease was completely overcome. From what has been said, it needs scarcely to be observed, that the practice of besmearing the gums with mercurial ointment, or rubbing them with calomel, for the purpose of encouraging this secretion, is extremely ineffectual.

Sometimes severe diarrhœa comes on during the early stages of recovery, attended with want of sleep; in which case, I have derived the greatest advantage from small doses of opium, combined with calomel.

We are usually advised, in *all* fevers which shew a tendency to intermit, to watch this period carefully; and to avail ourselves of the earliest opportunity such circumstances afford, of exhibiting bark in large doses, with a view to obviate the *debility* which, it is said, predisposes to the formation and return of another paroxysm. That in *some* fevers, and in certain habits and constitutions, this may be highly expedient and advisable, I do not venture to deny, as such practice stands supported by the best authority, and is justified by ample experience.

Without entering, however, into an examination of the above principles, which generally direct its use, I feel myself warranted to affirm, from the result of several cases in which this plan was adopted, in *the fever now under consideration*, that bark served only to exasperate the local disease, and to aggravate every symptom of the succeeding paroxysm.

In many cases which occurred towards the final cessation of the epidemic, at the close of the autumnal season, the local symptoms were much milder, and the fever became intermittent, after a moderate evacuation of blood, and a free use of laxative medicines. In those cases, calomel was the medicine I chiefly employed; and I almost invariably observed that, when carried to an extent sufficient to manifest its action on the system by the usual criterion, the paroxysms soon after ceased to return"—*Ed. Journal.*

The testimony of such a man as Boyle in favour of the *union* of depletory measures with a mercurial treatment, will have some weight; and, in conjunction with the various documents brought forward in this essay, must remove all doubts on the occasional necessity of such a modification of practice.

MALTA.

Sec. IX.—The climate of this Island, so celebrated in the annals of war and chivalry, and now so important a point of strength in the insular empire of England, need not detain us long. Its salubrity, mildness, and equality have indeed been much exaggerated by the late Dr. Domier; nevertheless it is still remarkable for *comparative* dryness of soil and atmosphere—paucity of rain, brightness of sky, and exemption from great and sudden transitions of temperature. The difference of temperature also between day and night is not so great as in Sicily or other Mediterranean Islands, owing to the flatness and calcareous nature of its surface. Here are few thunder storms, or gales of wind—little or no dew—hardly any fogs. On these accounts *pulmonary consumption* is much less prevalent here than in other contiguous situations—even than in Portugal or the south of France. But the dry chalky soil *reflects* a distressing heat in the summer months, when the thermometer ranges from 84 to 90 degrees in the shade. As there is no favourable source for the formation or extrication of miasmata, so there are no endemic fevers. In times of war, however, when great bodies of our seamen were occasionally exposed to the intense heat of the sun, violent exercise in refitting and watering, inebriety, &c.—then bilious and inflammatory fevers, with great determinations to the head and hepatic system, were common enough. They were subdued by the depletory and mercurial plans already detailed.

EGYPT.

SEC. X.—Independent of those sensations of pride which every Briton must feel at the mention of Cairo, Alexandria, or the Nile, the memorable theatres of British valour, Egypt presents an interesting link in the medical topography of tropical and tropicoid climates. Stretching, in the shape of one of its own pyramids, from Cancer to the Mediterranean, and flanked on both sides by burning sandy deserts, the thermometrical and barometrical qualities of its atmosphere bear little similarity to those of parallel latitudes; and hence the influence of this anomaly in climate on the health of the human race, is a matter of useful enquiry.

The thermometer at noon, in the shade at Cairo, averages 97° in the months of May, June, July, August, September, and October, with a diurnal vicissitude of 30 or 40 degrees. In the winter months, it averages 70° and is never seen below 40. During the hot season, from March till November, the air is inflamed, the sky sparkling, and the heat oppressive to all who are unaccustomed to it. The body sweats profusely, and the slightest suppression of perspiration is a serious malady. The departure of the sun tempers, in some degree, these heats. The vapours from the earth soaked by the Nile, and those brought from the sea by northerly and westerly winds absorb the caloric dispersed through the atmosphere, and produce an agreeable freshness, which causes the susceptible Egyptian to shiver with cold; excepting in the winter, and near the sea, a shower of rain is rarely seen. The winds vary in their temperature and dryness or humidity, according to the point from whence they blow, and the season of the year. From the north and west they are moist and cool, as passing over the ocean; from all the other points they are hot and dry, as coming over vast tracks of burning sand. The south wind, in particular, is called the *Kamsin, Simoom, Samiel, &c.* the heat of which is similar to that of a large oven at the moment of drawing out the bread. The atmosphere now assumes an alarming aspect—the sky becomes dark and lurid—the sun loses his splendour, and appears of a violet colour. This wind increasing gradually as it continues, affects all animated nature. Respiration becomes

difficult—the skin parched and dry; and the body is consumed as though by an inward fire, for no quantity of drink can restore the perspiration. In December and January, however, these southerly winds are *cool*, as they then come over the snow-capt mountains of Abyssinia, the sun being at his farthest southern declination.

Now, as, in summer, the most prevalent winds come from the Mediterranean sea, impregnated with aqueous particles, so copious dews are precipitated in the nights of this period, all through the delta in particular, occasioned by, and increasing the diurnal transition. Thus at Alexandria, after sun-set, in the month of April, the clothes exposed to the air, and the terraces are soaked by the dews, as though there had been a fall of rain. To this it may be added that a portion of the valley of Egypt is annually overflowed, for two or three months in the summer, by the waters of the Nile, either by natural inundation, artificial canals, or machinery.

If this slight medico-topographical sketch, be compared with what I have said respecting Bengal and the Coast of Coromandel, it will, at once, be perceived that the climate of Egypt combines, in a considerable degree, the peculiarities of both the former. It has the *inundation* from its central river, as Bengal;—it has its *samiels* or hot land winds, with an excessively high range of temperature, as Madras. Now if these two peculiarities equally prevail in Egypt, we may expect to find an equal ratio of the diseases peculiar to the two Asiatic localities above-mentioned; whereas if we find one of the climates predominate over the other, and also one of the classes of disease obtain a proportional superiority, it will surely go far to elucidate and confirm the origin and nature of those endemics peculiar to the two oriental provinces, described in the early part of this work.

First, the inundations of Bengal and Egypt are very different. Accompanying the *former*, there are constant deluges of rain that keep all parts of the ground in a plash. In the *latter*, what is not inundated is dry. In Bengal, the bed of the inundation, when the waters have subsided, remains long in a miry state. In Egypt, such is the power of the sun, the aridity of the atmosphere, and the force of perflation, that the water has no sooner deserted the plains than the *latter* are turned into a solid crust, which soon splits in to innumerable segments. "At that time, the soil, in hardness, resembles one continued rock, and is fissured every where with deep chinks. When we encamped in the delta, it was

impossible to drive a tent pin into it, except by fixing it in one of the openings; and the detached clods, lying around, were hard enough to be used as mallets." *Dewar on Dysentery in Egypt. p.* 3—4.

From these circumstances, we are prepared to find that the extrication of *miasmata* in Egypt is on a very confined scale indeed, when compared with Bengal, and consequently that remittent and intermittent fevers are in proportion. "Egypt, says Dr. Dewar, is less exposed than most other "flat countries, in high latitudes, to bilious fevers of the in- "termittent and remittent kind, as it is free from those "marshy miasmata which serve to generate and to cherish "the contagion of these diseases. Intermittent fevers only "prevail during the decrease of the Nile, *in houses surrounded* "*with stagnant water.* At other seasons they are confined "to places in the neighbourhood of extensive *rice grounds*, "such as the town of Damietta." *p.* 5.

It is true, indeed, that in particular situations, those natural causes which have happily secured Egypt from the deleterious influence of paludal effluvia, are counteracted by the perverseness and filthiness of the inhabitants. "This advantage, however, is counterbalanced by the dirty mode of living that generally prevails. The people seldom wash their clothes, and never shift them on going to bed. The offals of butchers' stalls are left in the open street, where they perpetually spread putrefaction and poison in the atmosphere. The sun would, in some degree, obviate this mischief, by drying them into hardness; but after they accumulate in the streets, they are thrown into the river or the sea, where they not only pollute the water, but, *lying just within water mark* [there are no tides] are soaked with that quantity of moisture which is sufficient to keep the putrefactive fermentation in its most active state, and which allows them to disseminate their effluvia in the air." *On Dysentery in Egypt. p.* 6.

Now, having satisfactorily accounted for the *comparative* immunity from miasmal fevers, which the Egyptians enjoy, beyond the Bengalese, let us turn to the parallel between Egypt and the Coromandel coast. But here the disparity of climate is not so great as in the other two instances, and the great prevailing diseases are proportionally analogous. I have traced the *gradual* deterioration of the biliary apparatus on the Coromandel coast to a high range of temperature, and its *sudden* derangements to atmospherical transitions. The very same thing happens in Egypt—from similarity of cause.

"Elephantiasis and leprosy, says Dewar, are frequent diseases in Egypt. *Obstructions in the liver and dropsies are still more frequent.*" *p.* 6. How much our troops suffered from *dysentery*, which I have proved to be connected with *liver* disease, is well known to our army surgeons; and Baron Larrey was so struck with the prevalence of *hepatitis* in Egypt, that he has taken some pains to frame a theory for its explanation. He attributes the cause to a high range of temperature dissolving the fat of the mesentery, which becomes clogged in the liver. I do not quote his theory for its ingenuity, but to shew the extent of the disease. And now I trust the idea of Dr. Saunders and many others, that hepatitis in India is owing to a *local indigenous poison* there, unlike any thing in any other country, will no longer be held. —This section has proved an identity of cause and a similarity of effect in India and Egypt, and consequently has solved a mystery that obstructed the path of medical science on an important point in pathological investigation.*

Before leaving the banks of the Nile, let us glance at a few *indigenous* customs, from which the medical philosopher may often glean useful hints. The natives, during the hot season, subsist chiefly on vegetables, pulse, and milk. They make frequent use of the bath, and avoid stimulating beverages. Those who live in tents take care to have their coverings constructed double, in order that the non-conducting stratum of air may defend them from the atmospheric heat. Again, as in the East, the various folds of the turban form a powerful non-conductor, when they are exposed to the direct rays of the sun, and preserve them from *Coups de Soleil*, while the sash, like the oriental *cummerband*, encircling the abdomen, preserves the important viscera within from the deleterious impressions of cold, during a sudden vicissitude of temperature, or an exposure to the dews or night air; thus forming an article of utility as well as ornament.

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* I have already hinted that on the Coast of Africa where the heat is excessive, liver complaints are very prevalent. Of this I lately saw a striking example in the Tigress brig after returning from that station. No ship from India ever presented a more distressing picture of hepatitis and dysentery than this vessel did. Captain Beaver in his African memoranda gives the following thermometrical ranges of the six winter months, viz. from August to April. August 74 to 82—Sept. 77 to 85—Oct. 81 to 91—Nov. 84 to 96—Dec. 64 to 92—Jan. 63 to 98—Feb. 88 to 96—March 86 to 95—April 85 to 94°. Captain Beaver's work shews the prevalence of hepatic diseases on the coast.

LOIMOLOGIA;

OR,

Practical researches on the Plague.

SEC. XI.—Many philosophers have attempted, and with no mean success, to trace a chain of animated beings from man down to the polypus; and thence through the vegetable creation to the mineral in the bowels of the earth; so that—

"Whatever link we strike,
"Tenth, or ten thousandth, breaks the chain alike."

It would not, perhaps, be very difficult to shew a similar catenation in the circle of diseases by which we are surrounded. There are scarcely two diseases, however opposite in their phenomena when viewed in an insulated shape, that are not linked together by others partaking in the nature of both. At a first glance, the yellow fever and small pox would seem unmeasurably separated and widely distinct in every respect; yet the *plague* presents as fair a connecting link between them as the polypus does between the animal and vegetable kingdoms. Like Causus, the Plague is under the influence of the *atmosphere,* and limited within certain *thermometrical* ranges:—like small pox, it is propagated by contact, inoculation, or exhalation; and productive, in general, of local eruptions. Nevertheless it is as distinguishable from either, as the polypus is from the Lord of the Creation on one side, or the Cedar of Lebanon on the other.

This destructive and mis-shapen enemy of the human race has ever been clothed in darkness and mystery, which add not a little to its real and imaginary terrors.—It may justly be characterized as a—

"Monstrum horrendum *informe*, ingens cui *lumen* ademptum!"

Which unites all the bad qualities of the two diseases alluded to. It combines the rapid march and fatal issue of the western causus, with the dire contagious influence of the Eastern Variola!*

* One of the latest writers on the subject of plague, Dr. Calvert, asserts that it's poison radiated through the *atmosphere* on the inhabitants of Valletta, from a vessel in the centre of the quarantine harbour, and consequently that all precautions against *contact* were useless and delusive—*Med. Chir. Trans. vol.* vi.

Such an engine of destruction must, long ere this, have annihilated mankind, had not the omniscient Creator encircled it with various atmospherical barriers which are constantly arresting its progress, or suspending its powers. If "the pen of writers has done little more than record the times and places when and where it proved most fatal—its devastations, and the variety of modes of treatment which had no certain success," be it remembered that this very sentence, so disheartening to the medical philosopher, was, not long since, applied to *dysentery*, over which we have now a very strong control. All then may not be lost in respect to the plague. It may yet come under rule, and bow beneath the influence of medicine. At all events, it is our duty, as it ought to be our pride, never to succumb without a struggle. Let the Ottoman lie supine under the fetters of fatalism, while the Christian philosopher exerts those faculties bestowed on him by his Creator, in defending that Creator's noblest work from *premature* decay!

Although the venerable and laborious Russel shall form the text or basis of this section; other and more recent writings will not be overlooked. But as *references* and formal *quotations* would swell the work too much; and as I have no particular theory or practice to support on the occasion, the reader will probably give me credit for fidelity and accuracy in the compilation, and absolve me from all suspicion of misrepresentation.

Previously, however, to entering on the symptomatology, &c. of the disease, it is necessary to state that I have derived much assistance from my esteemed and able friend Dr. Dickson of Clifton, in this section of my work. Dr. Dickson while stationed in the Levant, in the year 1803 had frequent opportunities of collecting interesting information relative to plague, and particularly from Padre Luigi de Trincon who, for a great number of years, had been superintendent of the plague hospital at Smyrna. The history of this venerable and benevolent man, as related by himself, and authenticated by others, is briefly this. Having been most severely attacked by the plague, about thirty-six years previously, and his life being despaired of, he made a vow, in the event of recovery to dedicate his services to those who should be similarly afflicted. He recovered, and for some time adhered to his resolution; but the desire of revisiting Pavia, his native country, induced him to leave Smyrna. His vow, however, continually recurred to him; and he soon returned again to

Smyrna, where he has ever since pursued his original resolution of attending on those afflicted with plague. He administers to his patients with his own hands ;—consoles and cheers them ;—sits, and even sleeps upon their beds ; and in fine, has been principally indebted for his success to such attentions, as he knows little of medicine.

Sub-sect I. Symptomatology. Fever.—This, according to Russel, was, with very few exceptions, a constant attendant at one stage or other, but varying greatly in different subjects. Usually preceded by sense of weariness, shivering, and confusion rather than pain in the head. Cold stage shorter than in tertian ; but the symptoms in hot stage more anomalous and alarming. In many cases, however, the pyrexia differed so little from that in other fevers, as to lead to no diagnosis, unless buboes were protruded, which left no doubt. Fever usually declined in the morning of the second day ; but varied much in intensity of force, even in the 24 hours ; the exacerbations being irregular as to violence and duration. Generally speaking, there were morning remissions and evening exasperations. Still the march of the disease was rapid—the patient, on the second or third day, being reduced, in point of muscular strength and sensorial energy, to the condition of one in the last stage of typhus. Yet to this desperate state would succeed a remission in which his senses and intellectual faculties were restored—the vital functions went on calmly, and all but weakness seemed to have vanished like a dream.

Remissions of this kind, when early in the disease, or unpreceded by a sweat, were often fallacious ; but when on the third day, or later, and induced by a sweat, especially if the pulse kept up, and the head clear, they gave hopes of a favourable issue.*

Delirium.—Not so high as in some other fevers†—seldom commenced before the second day, increasing in the exacerbation, lessening in the remission—sometimes going off for some hours in the day, but returning at night. Padre Luigi corroborates this statement, but has seen delirium and insensibility come on early.

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* The *initiatory* symptoms, according to Faulkner, the latest writer, were, at Malta, besides the foregoing, pain of the back opposite to the kidneys—drunken appearance of the countenance—inability to stand upright—aversion to being thought ill. " I have neither drunk wine nor spirits," said General Menou, " and yet I feel as a drunken man."

† Dr. Faulkner found it rise to *maniacal fury* in some instances, at Malta.

Coma.—Very often alternated with the delirium.—It was always a dangerous symptom; but more so as it approached early, and failed to abate in the remissions. The patient is roused without difficulty—answers rationally at first, but soon becomes impatient—denies having slept, and as soon as left, relapses again into slumber.‡

Loss of speech, faltering, and tremor of the tongue, were not uncommon symptoms. Impediment of speech sometimes continued for months after recovery. Dr. Dickson, who had frequent opportunities of seeing plague in the Levant, observes that the tremor of the lips is often of a peculiar kind, a sort of biting motion, which is a dangerous symptom.

Deafness was seldom observed; though the sense of hearing was occasionally impaired. Dr. Dickson informs me that the patients sometimes became deaf.

Muddy Eyes.—This was a remarkable symptom. It sometimes was visible from the first day, but more commonly from the second or third, remaining till some favourable change took place. It is a strange compound of muddiness and lustre—is little affected by the remissions; but, in the exacerbations, the eyes acquire a redness that adds wildness to the look. The disappearance of this symptom is always favourable. It was almost invariably present in fatal cases. Sir B. Faulkner considers it without doubt one of the most leading and faithful monitors of the presence of plague. He was seldom wrong in his diagnosis, where any unusual whiteness of the tongue accompanied this appearance of the eye—"even though there was no intumescence or redness about the glands, nor any confession of complaint." In the the first instance which Dr. Dickson saw of the plague, and where he was unintentionally a visitor, he was particularly struck with the drunken appearance of the eye, and was at a loss what to think of the case, until the patient shewed him a bubo in his groin!

White Tongue.—The tongue was often natural; but when it changed, it generally became white, and remained moist. Sometimes it was parched, with a yellowish streak on the sides, and a reddish in the middle; but its condition rarely corresponded with the febrile symptoms.

Pulse, is generally low, quick, and equal; in some bad cases, fluttering or intermittent, or low and nearly natural.—

‡ The comatose symptoms strongly resemble those of the Mariegalante fever, so well described by Dr. Dickson in a subsequent section.

In the more advanced stages of the disease, instead of rising in the exacerbations, the pulse was apt to quicken and become so small as scarcely to be felt. At Malta, in the last plague, the pulsations in ulterior periods, seemed to succeed each other in a continued stream, and defied calculation. But this function varied so much as to be *res fallacissima*.

Respiration was seldom affected, except in the exacerbations of advanced stages, when it became laborious. No pain felt on a full inspiration. Yet the patients frequently sigh, as if from oppression on the lungs.

Anxiety, that is, a sense of oppression about the præcordia, is a constant attendant on the plague; and its early appearance was unfavourable. "The sick," says Russel, "shewed how severely they suffered, by their perpetually changing posture, in hopes of relief; but when asked where their pain lay, they either answered hastily, 'they could not tell,' or with a fixed, wild look, exclaimed—'*Kulbi! Kulbi!*' (my heart! my heart!) This anxiety encreasing as the disease advanced, terminated at length in mortal inquietude." p. 88.

Pain at the Heart.—Though this was often conjoined with, it was often distinct from the anxiety abovementioned. The patients often exclaimed, as in the other case, my heart! my heart! pointing to the *Scrobic. Cordis*; but then they would add *eujani Kulbi*, my heart pains me! or *naar fi Kulbi*; my heart is on fire! They could not bear the slightest pressure at the prœcordia.

Debility.—The sudden prostration of muscular strength and nervous energy appertains, in a particular manner to the plague, beyond that observed in any other disease. By its higher degree the more fatal forms of plague were distinguished. "In the most destructive forms of the plague, the vital principle seems to be suddenly, as it were, extinguished, or else enfeebled to a degree capable only for a short time to resist the violence of the disease. In the subordinate forms, the vital and animal functions, variously affected, are carried on in a defective, disorderly manner, and denote more or less danger accordingly."—*Russel, p.* 89.

Fainting, in different degrees, was a very common symptom, and sometimes, though rarely, terminated in syncope. It was not so much aggravated by the perpendicular, nor relieved by the horizontal posture, as in other fevers.

Convulsions sometimes mark the access of the fever; and convulsive motions of the limbs frequently attend the course the disease, especially where there is a numerous eruption of

carbuncles. *Subsultus tendinum* is not a very common symptom; but a continual trembling of the hands is generally observed. Luigi informed Dr. Dickson that singultus was not an uncommon symptom, and that sneezing was a very favourable phenomenon.

Urine.—Nothing decisive can be learnt from this excretion. Luigi, however, frequently observed it of a very high colour, and depositing a lateritious sediment.—*Dickson.*

Perspiration.—Where the skin remains torpid and dry continually; or where short and precipitate sweats are attended with no favourable symptoms, danger is to be apprehended. On the other hand, the spontaneous supervention of an early perspiration is a flattering omen.

Vomiting.—This symptom, according to Russel, is "absent in a large proportion of the sick." Where it began early, and continued obstinate, it was a fatal symptom. Bile was sometimes thrown up, accompanied with bitter taste in the mouth—"a yellowness in the eyes," and "a blackish liquor sometimes came off the stomach in the last stage of the disease, in the production of which, blood may, perhaps, have had some share."—*Russel.* Faulkner makes no mention of *vomiting* in the late plague at Malta; but says that in the worst species the "stomach was extremely irritable." Russel admits that *nausea* was more common. Is not "stomach extremely irritable" equivalent to the mention of vomiting?

Diarrhœa.—Sometimes comes on the first day, but more usually supervenes in the advanced stages of the disease, and in either case, unless other things were favourable, may be set down as a *signum funestissimum.* Russel, and Faulkner. The latter observes that, in the plague at Malta, the alvine evacuations were commonly of a darker appearance than natural—sometimes of a greenish tinge mixed with scybala, particularly where voracity of appetite attended. Dr. Russel sometimes saw dark-coloured blood discharged by stool, unmixed with feces, and without griping. "*Costiveness was attended with no harm, and often with little inconvenience.*" Russel. Luigi confirms this remark.

Hæmorrhages were, in general, unfavourable symptoms.

Thirst, the never-failing attendant on febrile diseases, is by no means invariably present, even in the worst forms of the plague. "The like remark holds of want of appetite. Throughout the disease, this function is not only *not* impaired but augmented to a degree bordering on voracity." *Faulkner.*

We shall not follow Dr. Russel through his six classes of the disease, but rather adopt the concise and less complicated divisions of Dr. Brooke Faulkner, in his recent description of the plague at Malta.

Species I.—That in which, at the first attack, the energy of the brain and nervous system is greatly impaired, indicated by coma, slow drawling or interrupted utterance. In this description of the disease, the tongue is white, but little loaded with sordes, and usually clean, more or less, towards the centre and extremity; the anxiety is great; cast of countenance pale; stomach extremely irritable, and the strength much impaired. Rigors and pain in the lower part of the back are among the early precursors of the other symptoms. This was observed to be the most fatal species of plague, and prevailed chiefly at the commencement of the late disasters. Those who were thus affected died sometimes in the course of a few hours, and with petechiæ.

Species II.—The next species I would describe is, that in which the state of the brain is the very reverse of what takes place in the former, the symptoms generally denoting a high degree of excitement: the pain of the head is intense; thirst frequently considerable, though sometimes wanting; countenance flushed; and utterance hurried. The attack is ushered in by the same rigors and pain of back as the foregoing. Epistaxis not unfrequently occurs in this class of the disorder. The glandular swellings come out very tardily, and after appearing, recede again, without any remission of the general symptoms. Carbuncles arise over different parts of the body or extremities, which are rapidly disposed to gangrenous inflammation. The delirium continues extremely high and uninterrupted, and the patient perishes in the course of two or three days. Sometimes he lingers so far as the seventh, yet rarely beyond this period, without some signs of amendment. Of this second description, the examples have been very numerous, and were nearly as fatal as the preceding. In the countenances of some, just previous to the accession of the more violent symptoms, there is an appearance of despair and horror which baffles all description, and can never be well mistaken by those who have seen it once.

Species III.—The third species which I would enumerate, is nearly a kin to the last, only the symptoms are much milder, and the brain comparatively little affected. The buboes and other tumours go on more readily and kindly to suppuration, and by a prompt and early employment of reme-

dies, to asssist the salutary operations of nature, the patient has a tolerable chance of surviving. Cases of this kind are often so mild, that persons have been known to walk about in seeming good health, and without any evident inconvenience from the buboes. Of this last species, the instances have, thank God, not been unfrequent, chiefly occuring towards the declension of the malady.

Buboes and Carbuncles.—The presence of these, separately or in conjunction, is diagnostic of true plague; and removes all doubt as to its nature; "but fatal has been the error of rashly, *from their absence*, pronouncing a distemper not to be the plague, which, in the sequel, has desolated regions, and which early precaution might probably have prevented from spreading."—*Russel.*

Although in some of the worst forms of the disease [for instance in Russel's and Faulkner's *first* classes, where the patients frequently perished in twenty-four or thirty-six hours] --buboes and carbuncles are rare, yet, generally speaking, may he considered as constantly concomitant phenomena:—not so carbuncles, which were observed in about one-third of the infected only. The inguinal, axillary, parottid, maxillary, and cervical glands were the seats of buboes in the order they are set down; but the *first* was by far the most frequent. The inguinal pestilential bubo was, for the most part, situated lower in the thigh than that of the venereal. A burning, shooting pain is often felt in the part, anterior to the appearance of swelling; and, when the tumour is once formed, there is always pain on pressure. In the incipient state of the bubo, a small, hard, round tumour is felt by the finger, more or less deeply seated, but generally moveable under the skin, which is yet colourless and non-protuberant. As the gland enlarges, it commonly takes on an oblong form—becomes more immoveable,—and the integuments thickening protrude into a visible, circumscribed tumour, without external inflammation. The progress to maturity is more or less rapid; but not apparently influenced by strength of constitution or the contrary—hence the prognosis from the bubo is very uncertain.

In Dr. Russel's experience, the bubo seldom began to inflame *externally*, or shew symptoms of maturation till the fever had abated, and was manifestly on the decline. This happened at various periods, but rarely sooner than the 8th or 9th day, the inflammation then advancing, the tumour, by degrees softened, and opened of itself between the 15th and

22nd day. The buboes that did not suppurate, dispersed gradually in one or two months.

In a very large proportion of Dr. Russel's patients the buboes made their appearance in the course of the first day. In the slightest cases, they were often the first symptom of infection.

Carbuncles were seldom observed by Dr. Russel before the month of May—they grew rife in the summer, and became gradually less common in autumn. The carbuncles that fell under the observation of Sir Brooke Faulkner in the late plague in Malta were of that kind described by authors as the *wet carbuncle*, sloughing into very deep sores, and attended during the progress of inflammation, with an extremely painful, burning sensation. At first, they arose like a phlegmon, gradually acquiring a diffused and highly inflamed base, and having, not far from the apex, a concentric areola of a deep livid, and more internally of a cineritious colour, and a glossy appearance. These carbuncles were not confined to any particular part of the body or limbs, though most commonly they are situated upon some part of the extremities. Of the *dry* carbuncles, as they occurred in a few cases, the description corresponds with that of authors—being of a dark, gangrenous colour, without much pain, with little or no inflammation, or elevation above the surface. *These* were always unfavourable symptoms.

Petechiæ in the plague at Malta were various in point of size and colour—in some, of a dark, or dusky brown—in others livid—in some, so small as to be almost imperceptible—in others, as large as flea-bites. *Situation*, over the breast, arms, wrists—sometimes over the back, or lower extremities.

Pathology.—As scarce a ray of light beams upon this subject from *Post Mortem* researches,* and probably never will, we are left to ground our pathological *opinions* on the phenomena of the disease, in its course to recovery or death. Upon a careful review of these, it is but too plain that *remedial measures* have had, as yet, scarcely any control over plague. In the *graver* forms, medicine has been confessedly useless—in the *milder*, it was probably unnecessary—in the intermediate shades it may have had some influence. From

* Baron Larrey opened a few bodies dead of the plague in Egypt, and found the liver engorged and disorganized—the stomach and intestines gangrened—the heart soft and flabby. The brain was not examined. One of the assistants who helped to open the bodies caught the plague and died. The above phenomena are little different from those presented as the effects of other fatal, congestive fevers.

this, and various other considerations, we may most safely conclude that plague, though influenced by the atmosphere, is propagated by a poison or contagion, strictly *sui generis*,—equally as much so indeed, as that of variola. Now, over any one of these *eruptive* contagions, excepting the syphilitic by *mercury*, and the variolous by inoculation, we have not one particle of power, *after* it is received into the system.* In what way they produce their baneful influence on the living machine we are nearly, if not totally ignorant; but their effects are expressed by three great features or phenomena—depression and reaction, with a local determination. In the *first*, when excessive, and consequently dangerous, the powers of the system seem paralyzed or *stifled* and are not unfrequently annihilated;—In the *second*, when excessive, and consequently dangerous, Nature appears, in her frantic efforts, to commit suicide on herself, by destroying some organ essential to life, or exhausting, beyond recruit the whole fabric;—In the *third*, or local eruption, some *sanative* process is effected, of which we *only* know that it *is* sanative—

> ——— ——— Sive illis omne per ignem
> Excoquitur vitium, atque exudat inutilis humor:—
> Seu plures calor ille vias, et cæca relaxat
> Spiramenta. *Georgicorum lib.* 1—*p.* 87.

Now till we find out *specifics* for the other contagious poisons, as mercury proves in syphilis, the sum total of our knowlege leads but to this; that in the *first* instance, we are to endeavour to rouse or animate—in the *second*, to curb or restrain, and in the *third*, to leave alone, the EFFORTS OF NATURE.

This reasoning, indeed, will very nearly apply to the whole range of fevers; but unfortunately there is something more mysterious and intractable in those accompanied by *eruptions*, than in any of the others. This is particularly the case, in those forms of plague where nature appears to lie prostrate under the influence of the poison, without the power of resistance, much less of reaction! Here we may apply the warm bath to the external surface of the body, and cordials or stimulants to the internal; but alas! the nervous and vascular systems are so entirely deranged, that Nature, unable to avail herself of our assistance, sinks in the struggle, without the means of extricating herself from the mortal grasp of the enemy, or the power of accelerating her own destruction!

* I mean we have no power in arresting the progress of the *poison*; though we have much in mitigating the violence of reaction in the *system* itself.

Plague, as an eruptive fever, differs so essentially from endemic or miasmal fevers, not only in respect to its contagious origin, but its critical determinations, and also the mode of treatment, that one would hardly expect to find an amalgamation attempted in the present day. yet such a doctrine has been recently maintained by two medical gentlemen, Dr. Robertson, and Mr. Torrie.* The latter asserted that the plague was *not* contagious, and fell, of course, a victim to his own infatuation; the former endeavours to shew that the causes of plague and remittent fever are the same—that the symptoms, and *post mortem* appearances differ only *in degree*. He acknowledges, however, that he never saw the plague, and independently of this, his arguments are not of that weight that require a serious refutation.

Therapeutics.—The following is an abstract of Dr. Russel's *Methodus Medendi*. One early *bleeding*; which was very seldom repeated, excepting where circumstances unequivocally demanded it. Where vomiting was a concomitant symptom, it was encouraged by draughts of warm chamomile tea till the stomach was well cleared of bile or other colluvies. Where this was not sufficient, an emetic of ipecacuan was exhibited, after which an opiate. *Purgatives* were rarely given.

As soon as the stomach was settled, mild sudorifics were administered in small doses, as the acetate of ammonia and citrate of potash. If a diarrhœa prevailed, as it was never observed to prove critical, it was restrained by diascordium and opiates. Dilution—cool air in the beginning; but towards the height of the exacerbations, upon the first appearance of moisture on the skin, the sick were kept moderately covered up from the chin downwards. The diet was the lightest possible. For the coma and delirium, sinapisms and pediluvia were employed. For the oppression at the præcordia, mild cordials, acidulated drinks, and cool air were serviceable. After the height, and through the decline of the disease, bark in powder or tincture was exhibited. In the decline of the disease purging was employed by the European, but seldom by the native practitioners. Relapses, though exceedingly rare, do sometimes take place.

Treatment of the Plague at Malta.—Sir Brooke Faulkner's indications are, 1st. when inflammatory symptoms are violent at the *beginning*, to moderate them cautiously.

* London Medical Repository, Dec. 1817.

2nd. to restrain all inordinate efforts of nature; or support her when exhausted. 3rd. to counteract putrescency. 4th. to evacuate the morbific matter. These indications are proposed to be fulfilled by evacuants, tonics, antiseptics, blisters, sudorifics.

Evacuants. Purgatives are rarely ventured on by the Maltese, except in very strong, plethoric habits, when sulphate of magnesia is given. At other times, supertartrite of potash, manna, almond oil, &c. are most esteemed. *Bleeding*, even locally, wss a precarious remedy, and no decisive benefit was obtained from its use. *Blisters* to the temples, nape of the neck, head, and shoulders were applied, in high delirium, or very low coma. Sinapisms to the soles of the feet. Mild emetics of ipecacuan at the very beginning.

The Maltese prescribe bark, colombo, gentian, and serpentaria, as soon as the state of the head allows. As a *sudorific*, the acetate of ammonia was preferred. Opium in some cases was useful; but required caution in the administration. Wine was given in the advanced stages, and often with benefit; but required great limitation. The same of cordials. The surgeon of the 3d Garrison Battalion, Mr. Stafford, has published several cases in the 12th vol. *Ed. Journal*, where mercurial frictions, externally, and calomel internally, proved very successful. The warm bath also proved useful. The cold affusion was tried in a few cases, and Sir B. Faulkner is inclined to augur favourably of it, when guided by the principles laid down by Currie.

Such is nearly the sum of the information Dr. F. has been enabled to collect upon this disheartening subject. It only verifies the words of the Poet—

> Dum visum mortale malum tantoque latebat
> Causa nocens cladis, pugnatum est arte medendi,
> Exitium superabat opem, quæ victa jacebat.

Prophylaxis.—Since we have made so few advances in the *cure*, we must be the more vigilant in regard to *prevention*. Of all the means which have been recommeded by ancients or moderns, none are equal to personal cleanliness—temperance—avoiding *contact*, or using immediate ablutions afterwards—shunning the breath, or vapour exhaling from the bodies, of the sick—ventilation—moderate exercise—attention to the great functions of digestion, perspiration, biliary secretion, &c.—Confidence. But a most important measure is the use of *oiled dresses*, the texture of which is so

completely close as to prevent the passage of the most minute particles of any matter from without. By these means every attendant on the military pest hospitals in Malta escaped the contagion. As to oil frictions, they are precarious preventives, though highly recommended by some, particularly Baldwin and Luigi.

The oil dress over every part of the body, while a sponge moistened with vinegar is held to the face, seems the most certain prophylactic. Might not a mask be annexed to the oil dress, with a tube of leather fitted to the mouth, and leading out of a door or window, through which the medical attendant might breathe while visiting the infected in Pest Hospitals and Lazzarettos?

Since writing the above, a mask has actually been constructed by a foreigner, composed of pieces of light fine sponge, which are to be soaked in different kinds of fluids, according to the nature of the deleterious gas or febrific miasm against which we are to guard. This, upon the whole, seems better than the mask and tube.

Western Hemisphere.

CAUSUS;

OR,

Yellow Fever of the West Indies.

SEC. I.—The following concise, but animated description of the fatal Western Endemic is written by Dr. Mc. Arthur, late physician to the Royal Hospital, Deal; and as he had the superintendence of a public hospital nearly six years in the West Indies, with the most extensive field for observation, this document will be found highly interesting and valuable. It probably contains *more* useful and practical information on the subject of yellow fever than some modern octavos of the most ample dimensions.

The endemic fever, commonly called the yellow fever, certainly excites the first interest, both on account of the mortality which attends it, and the discrepancy among professional men respecting its nature and treatment. The inhabitants of the West India islands, are subject to various fevers of the typhoid, catarrhal, or remittent kind. These attack indiscriminately the native or the seasoned European, and are as mild as fevers of a similar type in Europe. But the fatal fever, of which I am about to give some account, for the most part attacks persons from Europe, within the first *year and a half* after their arrival in the country, and more particularly seamen and soldiers.

It generally appears at a certain period of the year, earlier or later, milder or more aggravated, according to the state of the weather during that season. Solitary instances, however, occur at all seasons of the year, when favoured by predisposition, assisted by strong exciting causes. The natives are not entirely exempt, but to them it rarely proves fatal.

This fever is usually ushered in by the sensations which precede other fevers; such as lassitude, stiffness, and pain

of the back, loins, and extremities; generally accompanied by some degree of coldness. These are soon succeeded by a severe pain of the head; a sense of fullness of the eye-balls; intolerance of light; skin dry, and imparting a burning heat to the hand; pulse full and quick; tongue covered with a whitish mucus, but often not materially altered from the state of health; bowels bound.

If the patient has been attacked in the night, he awakes with oppressive heat, head-ache, and the other symptoms of fever, the sensation of cold having passed unnoticed. At other times, after fatiguing exercise in the sun, and sometimes after a hearty meal, the violent head-ache, and other symptoms of the fever, are ushered in by an instant loss of muscular power, and immediate depression of nervous energy. The patient, as if he were stunned by a blow, falls down, his eyes swimming in tears. In those cases, delirium is an early symptom. In a few hours, the pain of the loins increases, and, in aggravated cases, stretches forward towards the umbilicus; the countenance is flushed; the white of the eye as if finely injected by blood vessels, the albuginea appearing through the interstices of the network of vessels, of a peculiar blue, shining, cartilaginous whiteness.

During the first twelve hours, the patient is not particularly restless, enjoys some sleep, and, when covered by the bed-clothes, has partial perspirations on his face, neck, and breast.

About the end of the first twelve hours, there is a great exacerbation of the fever; he becomes restless; the heat and dryness of the skin increase; there is much pain of the eyes and frontal sinuses; the pain of the thighs and legs is augmented; thirst is increased, with a sensation of pressure about the region of the stomach. Nausea and vomiting occur towards the end of the first twenty-four hours. If the fever has not been arrested within thirty-six hours from its commencement, the patient is in imminent danger, and all the symptoms are aggravated; the pulse is strong and full, and pulsation of the carotids appears distinct on each side of the neck. The skin continues hot and dry; the thirst is increased; there is much anxiety, the patient continually shifting his posture; the urine becomes high coloured; all his uneasiness is referred to his head and loins. A sensation of pain is felt about the umbilicus, when pressed upon; the white of the eye now appears of a dirty concentrated yellow colour, and apparently thickened, so as to form a ring round the margin

of the cornea. The blood vessels of the eye appear more enlarged and tortuous; knees drawn upwards to the abdomen; frequent vomiting, with much straining; mucus, and his common drink only, being ejected. Delirium comes on about the end of the second day. There is now a dryness, or slight sensation of soreness of the throat when swallowing; and about this time, an urgent sensation of hunger comes on, and a remarkable want of power in the lower extremities, resembling partial paralysis of the limbs. About this time, also, the pain of the loins is so severe, that the patient expresses himself as if his "back was broken."

The third day, or stage, begins by an apparent amelioration of all the bad symptoms, the vomiting and thirst excepted. The matter ejected has small, membranaceous looking floculi floating in it, resembling the crust washed from a port-wine bottle. The thirst is now urgent, and there is an incessant demand for cold water, which is almost immediately rejected by the stomach. The heat of the skin is reduced; the pulse sinks to, or below its natural standard; the patient, for an hour or two, expresses himself to be greatly relieved, and at this time, a person unacquainted with the nature of the disease would have hopes of his recovery. This state, however, is of short duration, and the delusion soon vanishes.—The delirium increases; the matter ejected from the stomach becomes black as coffee-grounds, and is somewhat viscid.* Diarrhœa comes on; first green, then black, like the matter vomited. The patient often complains of being unable to pass his stools, from a want of power in the abdominal muscles. There is an acrid, burning sensation of the stomach, and soreness of the throat, extending along the whole course of the œsophagus, in attempting to swallow; eyes, as if suffused with blood; skin a dirty yellow; parts round the neck, and places pressed upon in bed, of a livid colour. Hemorrhage, more or less, takes place from the nose, mouth, and anus, and a deposition of blood from the urine. The delirium becomes violent; the body as if it were writhed with pain, the kness incessantly drawn up to the belly. The patient seizes, with convulsive grasp, his cradle, or any thing within his reach, and prefers the hard floor to his bed. The pulse now sinks; respiration becomes laborious; the countenance

* "The colour of the matter vomited is not essential to constitute the diagnosis of this form of fever; but the *increase* of the fluid beyond what has been taken in, more particularly if glairy, certainly is; and decidedly marks the gastric affection."——*Fergusson on Yellow Fever.*

collapsed—the lustre of the eye gone.—For some hours, he lies in a state of insensibility before death; at other times, expires after some convulsive exertion, or ineffectual effort to vomit. The tongue, during the whole course of the fever, is but little altered; and if loaded in the early stages, is clean and florid before death.*

Such is the regular succession of symptoms which characterize this fever, but of longer or shorter duration, according to the violence of the disease, or strength of the powers of life to resist it.

In weakly habits, the vascular action at the beginning is less marked; and in these cases, the fever is generally more protracted, and the patient expires unaffected by the laborious respiration, and convulsive motions, which attend the last struggles of life, in the more violent degrees of this endemic. Very often the patient retains his senses till within a few minutes of his death; and sometimes will predict, with considerable precision, the hour of his dissolution.

In the early stages of the worst cases of this fever, there is much anxiety in the countenance of the patient, who expresses a despair of recovery. This fear does not appear to proceed from any *natural* timidity, but seems rather a symptom of the disease. In the last stage, there is as much *resignation* to his fate, as there was apprehension at the beginning. The fever of the Amelia in 1804, and of the Northumberland and Atlas in 1805, terminated fatally from the second to the fourth day. The fevers of 1807 and 1808, extended from the third day to the fifth. I have never noticed a remission during the whole course of the fever. Several cases of remittent fever under my care terminated in the endemic fever.

A certain number of those attacked by this fever, if prompt measures to subdue it had been employed, recovered from its first stage. They exhibited evident signs of amendment within the first twenty-four, or at farthest thirty-six hours, from its first attack. Also, a considerable proportion recovered from the second stage; that is to say, previously to black vomiting unequivocally appearing. But I have only known thirteen cases, in above five years, to have recovered from the last stage. Some of these were afterwards invalided,

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* This confirms the observation of Dr. Blane, that in yellow fever, "the tongue is somewhat white and foul, but I do not remember to have seen it black and dry." 3d edit. page 413.

in consequence of dyspeptic complaints, and generally disordered state of the stomach, and other abdominal viscera.

In these cases, the stomach gradually became retentive; the eyes and skin became of a more vivid yellow; they had refreshing sleeps, but continued extremely weak and languid for a long time. The oozing of blood from the fauces and gums also continued for some days; and the deposition of blood in the urine remained longest; this excretion being always the last to return to its natural healthy condition.

Pain of the back, early stretching round to the navel—soreness in the throat and œsophagus—heat and acrid sensation in the stomach—urgent thirst—hunger—want of power, resembling paralysis of the limbs—violent delirium—despondency—enlargement of the blood vessels, and red-yellow colour of the white of the eye, either singly or collectively, indicate extreme danger; and when the black vomit has appeared, scarcely a hope remains!

The following were the appearances after death [four cases excepted] in above an hundred bodies which I have inspected.

Omentum a little altered.—Peritoneal coat of the stomach occasionally marked, in a slight degree, by inflammation.—The stomach contained more or less of a viscid, black fluid, such as was ejected by vomiting.—Irregular spots, patches, and streaks of the internal surface of the stomach, in a state of inflammation, gangrene, or sphacelus.—Sometimes large portions of the villous coat destroyed, as if *corroded by some acrid matter*.—The small intestines and cœcum inflated with air, and often containing lumbrici, and a small quantity of dark coloured fœces, were inflamed, and in many places approaching to the state of gangrene.—No marks of inflammation in the colon, but it was singularly contracted.—Lower part of the rectum frequently excoriated—Concave surface of the liver inflamed.—Gall-bladder turgid with ropy bile; and, in some instances, its coats were one-fourth of an inch in thickness.—Other viscera of the abdomen little changed.—In the thorax, the posterior part of the superior lobules of the lungs, generally were very turgid with blood.—Internal surface of the œsophagus, throughout its whole extent inflamed.

In ten cases of a peculiarly aggravated degree of fever, where much delirium had been present, I opened the head. The blood vessels, in some instances, seemed more turgid with blood than usual. In two cases, there were about two

ounces of serum effused into the lateral ventricles; but in five cases the brain did not exhibit any marked appearance of disease.

The black matter found in the stomach had not the most distant resemblance to bile; but evidently was blood poured into the stomach from the relaxed vessels, or excoriated and gangrenous surfaces, altered by the vitiated secretion of the gastric fluids.

Europeans, within the first eighteen months after their arrival in the country, being almost exclusively obnoxious to the yellow fever, it is natural to suppose, that there is something in the European constitution, favourable to the morbid motions which constitute this fever; and that this peculiar habit consists in a disposition to take on inflammatory action. Persons seasoned to the climate, and even natives, by sudden alterations in their mode of life, sometimes acquire this predisposition. Young people born in the West Indies, and educated in England; and persons having resided some years in England, after they had passed the greatest part of their lives between the tropics, are liable to this fever on the their return to the West Indies.

This disposition is excited into action by a variety of causes; the chief of which are—intemperance; excessive fatigue in the sun; perspiration checked, by being exposed to a current of air, or sleeping exposed to the dews; costiveness, &c. &c. In fact, whatever becomes an exciting cause of fever in any country, is equally so in this; but unfortunately it is not the same fever that is induced.

It has been observed, and very frequently urged by the *bon vivant*, as an excuse for his mode of life, that men who live in the most temperate manner, are as liable to fever, if not more so, than those who follow the opposite extreme.—There is an appearance of truth in this remark. Often, very often, the temperate and sober are seized with this fever, under circumstances where the drunkard escapes.

A stranger, on his arrival in the country, unless possessed of more than ordinary resolution, is assailed by so many temptations, that he has not the power to follow the plan he may have laid down for his own regulation. He commits an *occasional* excess, and next morning awakes in a high fever; while the man accustomed to his "*musquito dose*," probably feels no uneasiness, or if he has a slight head-ache from his last night's debauch, flies for relief to his hot punch or sangaree. The more temperate and regular a man has

lived, any deviation will become, in a proportionate degree, a stronger exciting cause of fever* But if the drunkard and the sober man should be attacked with fever, the former has not an equal chance of recovery with the latter.

Contagion, as a source of this fever, is entirely rejected by those professional men who have the greatest opportunity of information, now resident in the West Indies. No case occurred, where the fever could be traced to a contagious source. In the very first stage of this fever, it would probably be difficult to distinguish it from the other continued fevers of the country. Its violence is one criterion, by which we might form a judgment. We must also look to the particular circumstances of the person attacked.—If he has been but a short time from Europe;—if he has been taken ill after a debauch—fatigue—or unusual exposure to the sun, or to a partial current of air, or after sleeping in the night air, there is much reason to apprehend yellow fever; more particularly if the eyes be inflamed, and the pain of the loins stretches forward to the navel; with soreness of the throat—heat, and acrid sensation in the stomach; a feeling of pressure there, and urgent desire for cold drink. These, and the other symptoms already described, will indicate the nature and the danger of the disease.

Bleeding largely, in the early stage of the fever, has been found of the most eminent service. When employed after the first stage of the fever had passed by, it did injury, and certainly hurried on dissolution. The following plan is that which has been pursued at this hospital, for several years; it is that which has been practised by many of the naval surgeons on this station, and has been attended (would I could say with uniformly the happiest effect!) with at least superior success to that of any other.

From twelve to twenty-four ounces of blood and upwards, are drawn from the arm, as soon after the accession of the fever as possible. The blood should be drawn until derange- of the vascular action has taken place, by the quantity of blood extracted; indicated by approaching syncope, nausea and vomiting. Should fainting come on, from mental emotion, such as the dread of the lancet, sight of the blood, &c. the bleeding is to be continued after the patient has revived, until a quantity proportioned to the strength is drawn off. Six grains of calomel, and double that of cathartic extract,

* This is no argument against temperance; it only proves that its breach is more dangerous to the regular liver than to the debauchee.

are to be immediately given; and if this medicine does not operate in three hours, it is to be repeated. At the end of six hours, if the purgative has not yet had effect, it is to be assisted by an enema; and either an ounce and a half of sulphas magnesiæ, vel sodæ, or half a drachm of jalap, with an equal quantity of cremor tartar, are to be given.

In eight hours after the patient has been blooded, six or eight full, copious evacuations should be procured.

During this time, if the skin be hot and dry, the cold affusion is to be employed every two hours. Partial perspiration, in the early stage of the fever, should not deter from its use. *The greater the force with which the water is applied, the more benefit is to be derived from it.* When there is much pain of the head, the hair is to be shaved off. Thus the treatment, during the first twenty-four or thirty-six hours, consists in one full, large bleeding—purgatives, so as to procure several copious alvine evacuations—the cold affusion*—shaving the head; and the liberal use of barley-water, or any other weak drink.

Under this plan, fifty patients out of one hundred, attacked by the genuine endemic fever, will shew evident signs of amendment within the above-mentioned period. A general perspiration, not profuse, will break out; the heat of the skin will be reduced; head-ache, and pain of the thighs and legs will be abated; the red vessels in the white of the eye will disappear; the thirst will be lessened; and, in short, all the feelings of the patient will become more agreeable. From this state they recover with extraordinary rapidity. In one week they are restored to perfect health.

If this favourable change does not take place within the period alluded to, there is much danger. The patient becomes restless; the sensation of pain is more acute; delirium, vomiting, and other bad symptoms succeed. In this stage, the bowels are to be kept loose—two or three stools are to be procured every twenty-four hours, by calomel, given in four grain doses, three or four times a-day, as the state of the bowels may indicate. The cold affusion is to be continued, lessening the force with which the water is applied, as the vascular action and heat diminish. If delirium and vomiting are present, blisters are to be applied to the head and nape of the neck. Before the heat is reduced, and the vascular action

* The vapour bath, now coming into use at the naval hospitals abroad, bids air to prove a powerful auxiliary in soliciting the blood to the surface, and hus relieving the internal organs from the effects of CONGESTION.

brought down to its natural standard, stimulants are employed; such as wine, at first in small quantities, gradually increasing it; capsicum, in the form of pills. If the patient has been much addicted to spirits, toddy in lieu of wine is to be allowed; but the stimulant from which I have observed the greatest benefit, is the carbonate of ammonia, in doses of six or eight grains every two hours, with small doses of nitrous æther, diluted with water. When vomiting is urgent, the patients are to be restrained from drinking much; and when the stomach is empty, more benefit is derived from two table spoons full of arrow-root every half-hour, than from any medicine I have known. Vitriolic æther, and even ardent spirits, to restrain vomiting, as the heat and vascular motion subside, have been taken with partial relief.

This state may continue for two days, or even longer, before there is any remission. The first favourable symptom is usually a refreshing sleep, and the absence of delirium.—A warm and moderate perspiration covers the surface; and if the skin and eyes have been yellow, the colour becomes more bright.

Convalescence from this stage of fever is much more slow than from the first. Much attention to the state of the bowels, and the liberal use of the decoction of bark, with vitriolic acid, if there be much oozing of blood from the gums and fauces, are necessary. From that stage in which the black vomit is the prominent symptom, few—very few recover. Dark-coloured fluids, however, have been often taken for black vomit, where the latter did not exist, and thus nurses, and even medical men, have been deceived. All the cases that recovered at this hospital, were certainly unexpected. This dreadful symptom had continued in all of them above twelve hours; oozings of blood from various parts, stools as black as ink, &c. were present. The first sign of amendment was the stomach becoming retentive, and the enjoyment of a few hours sleep. The yellow colour of the eyes and skin became daily brighter, till at last the patient had the most perfect jaundiced look; the colour of the stools keeping pace with that of the eyes and skin. The stimulating plan of treatment, after full and copious evacuations in the earliest stage of the disease, was gradually begun with these patients long before the vascular action had been reduced to its natural standard. Wine frequently, and in small quantities—the carbonate of ammonia—capsicum, with arrow-root, were assiduously administered; and whenever the appetite of the

patient craved for brisk porter, spruce beer, &c. they were never denied; but these and other drinks were given in small quantities at a time, as larger caused instant vomiting.

Relapses from this fever frequently terminate fatally.—Want of appetite, and sensation of fulness at the stomach, usually precede the common train of symptoms. In these cases, I found an emetic give instantaneous relief. The patient generally vomits a large quantity of æruginous-coloured matter, and the evacuation is attended by immediate ease: two or three drachms of the tartarized antimonial wine (Edin. Phar.) are generally sufficient for the purpose. In the *usual* practice of the hospital, emetics are omitted, because they often delayed the exhibition of brisk purgatives, which are required to move the bowels in this fever. But there is one form of the endemic commencing with diarrhœa, and sometimes dysenteric symptoms, in which emetics are employed with advantage. When the fever, however, commences in this way, it is less dangerous, though more protracted, than where costiveness and torpidity of the bowels attend.*

In this, as in other diseases, anomalous symptoms will occasionally occur, requiring slight modifications of treatment; but these can only be learnt at the bedside. On this account, I forbear to enumerate laudanum, æther, ginger tea, effervescing draughts, champaigne, &c. which in high practice are sometimes prescribed. The practice of applying powdered capsicum to the raw surfaces of blistered parts, by way of counter-irritation, had nearly become fashionable from its novelty; but this barbarous practice, I believe, is nearly laid aside. I may mention, though out of place, that the actual degree of heat, as indicated by the thermometer, is not proportionate to the intensity communicated to the hand. The heat generally varied between 99° and 102°, very seldom exceeding 103°; yet the same imparted a burning caustic sensation to the hand at these times.—*D. M'Arthur.*

This ingenious and experienced physician does not suppose a residence in other hot climates to be any effectual security against the endemic of the West Indies. Several Regiments which had been a considerable time at Gibraltar, and were afterwards sent to the West Indies, in 1795, were cut off, almost to a man, by the yellow fever; and ships from the

* "The most favourable cases of the yellow fever, are those in which a "bilious diarrhœa comes on; while the most fatal are those in which the "bowels are so torpid as to be insensible to any stimulus, either from their "own contents or from medicine."—*Blane, 3d ed. p.* 450.

Coast of Africa (for instance, the Arab in 1807) were depopulated with as much rapidity as if they had come from England. This proves what I have before remarked in the Batavian endemic, that nothing but habituation to the *local* miasm, can secure us from the *local* fever, however theorists may generalise or identify the remote causes.* He concludes with this observation: "It is probable that as many lives "have been lost by the *temerity* of men who have resided in "*other* hot climates, as by the *timidity* of those direct from England."—This sentiment from *experience*, will outweigh a volume of eloquence from theory.

Observations on the Locale of Yellow Fever, by Dr. Fergusson, Inspector of Army Hospitals, &c.

The principal West India towns and garrisons for the troops are situated on the leeward shores of the country, at the bottom of the deepest bays that can be found, as a protection to their trade against the winds from the sea. The soil must consequently be alluvial, and is often marshy. Nine tenths of the towns are inclosed by high hills rising immediately behind them, which exclude the sea breeze that, in its natural course, ought to reach them from the windward side of the country. As their elevation is generally little above the level of the sea, we have abundant reason to conclude, that if the highest degrees of reflected tropical heat, defective perflation, and the miasmata that reside in marshy soils, or may be formed in the drier alluvial ones by heavy rains, can produce aggravated remittent fever, it must happen under such circumstances, especially where police and cleanliness are entirely disregarded.

The settlements of the planter, in like manner are formed, not on the elevated mountain ridge from which the periodical rains have washed away the soil, but in the alluvial grounds beneath, where his labour can with more certainty be turned to profit. Nor is it to be wondered at, under such circumstances, that a body of raw troops or young civilians, come to settle in town or country, should be swept away by tropi-

* Perhaps this passage in the 1st Ed. requires some modification. Residence in other tropical, or even tropicoid climates, probably confers a *comparative* degree of seasoning against the less powerful causes of fever in the West Indies.

cal fevers. The wonder is why it does not happen with more unerring certainty; for there are seasons, and even courses of seasons under apparently similar circumstances of heat and moisture, when even the declared swamp is comparatively innoxious to the newly-arrived European, and still more so to the seasoned inhabitant. This begets in the young adventurer or hardened votary of wealth, a fatal delusion of confidence which, though so often exposed by the melancholy recurrence of fatal fevers, is never cured.

The pestiferous quality of miasmata does not appear to depend *necessarily* either upon aqueous or vegetable putrefaction, however frequently it may be found combined with both. Every one knows that the miasmata are not generated from the body of the lake or pool, but from its drying, or half-dried margins. The swamp is no more than this margin rolled up under another shape. Water, without being absorbed by the subjacent soil, gives out no febrific effluvia. One of the healthiest quarters in the West Indies, is that of the field officers on Berkshire hill, the bed room of which is placed over a deep stone reservoir of water. But this said febrific miasma is very certainly generated from the *paucity* of water where it has previously abounded, provided that paucity be short of actual dryness. To the production of this a high atmospherical temperature is indispensible;—and in proportion to the intensity of temperature is the intensity of power in the miasma produced, varying its effects on the human frame, from the ordinary ague of Europe, and the West India Mountain fever, to the highest degree of remittent and yellow fever, which is never found remote from the level of the sea. It is comparatively innoxious to those who have had the good fortune to become habituated to its influence; and attacks with singular peculiarity of selection the robust, the young, and the healthy, in their first approach to its abode. If these be granted, I think we may be able to explain from the various compositions of soil, its elevation, aspect, and texture, as affording capacity to retain moisture, why every dry one can be brought, during an uncommonly wet season, through the influence of tropical heat, into the state of a marsh that gives out noxious vapours; while a marshy one approaching to dryness through previous drought may be made perfectly healthy from the same abundant rains. Thus Barbadoes, which from its cleared calcareous soil, is far more salubrious, in general, than Trinadad, has been lately afflicted severely with the worst forms of yellow fever;

while the latter Island remained perfectly healthy. In both places it has rained abundantly—particularly in Trinadad, whose extensive marshes have been overflown; while the alluvial soil on the shelves of table land at Barbadoes has been converted into a temporary swamp. So at St. Lucia, when the garrison on the lofty position of *Morné Fortuné* is healthy during the fine dry weather, the inhabitants of the town of Castrus, at the base of the same hill immediately below, and within half cannon shot, are visited by the worst fevers, and *vice versa* :—The dry weather gives activity to the miasmata which the rains dilute, refresh, or condense, at the same time that they are forming pools, and temporary swamps on the shoulders of the hill, immediately beneath the Barracks, on the summit of Morné Fortuné

So a deep ravine, impervious to the rays of the sun and free current of air, that has been a water course, may still, after its surface appears dried by the summer heat, retain sufficient underground moisture to give out the most dangerous miasmata—the more dangerous because the more concentrated for want of perflation ;—and so, in fine, salubrious and insalubrious soils may, under such circumstances, change places, in regard to health ; and localities in the neighbourhood of each, under the same modifications of climate, be very differently affected.

It has been inferred that yellow fever belongs to a different family from that of intermittent, because it seldom occurs at the same time with, or breaks off, in convalescence, into ague. Ague indeed is not a common production in the hot, low-land on or near the level of the sea—where alone the yellow fever is found. It is very rare, for instance, to hear of an ague originating in the leeward sea-port town of Basse terre, Guadaloupe, either amongst the troops or inhabitants ; but in the barracks on the cool marshy hills above the town, at an elevation of less than a thousand feet, it is a very common disease, among officers and soldiers, while their comrades in the town are devoured by concentrated remittents. The same may be said of nearly the whole of the West India towns. They are all so marshy that, in colder latitudes, they could not possibly escape agues, which however, very seldom originate, and are nearly unknown amongst them. The inhabitants of Barbadoes boast that they are exempt from agues, though the island has several marshes. Thus the reason is plain :—There are very few ridges there of sufficient elevation to belong to the region of intermittents, even supposing

their sides to be marshy, which they never are. The swamps are all in the lowest levels of the land; and when their morbific miasmata act upon the human body, they produce the greater or less concentrated forms of remittent fever, according as their powers are regulated by the temperature and climate of the season, or as the subject is presented under more or less favourable circumstances of seasoning, excitement, &c.

I am far from presuming to deny that there are fevers from pure excitement; "*for soldiers and others have been attacked and died of yellow fever before they landed in the West Indies, or could be exposed to the influence of land miasmata in any shape.*" From this it would appear that a calenture [the synocha of Cullen], the pure offspring of heat, as pneumonia is of cold, runs a course similar to the yellow fever.

"To the argument that the highest degree of concentrated "remittent or yellow fever, should neither remit nor break off "into ague, it seems sufficient to reply, that for any disease "to observe regular laws, it is necessary that the vital organs "principally affected should continue in a certain degree of "integrity; that their functions should only be disturbed and "perverted to a given point; that they should still be discernible as functions, and not be utterly overwhelmed and "extinguished by the violent cerebral action and speedy gangrene of the stomach that take place in aggravated yellow "fever; As the ulcer of a specific poison that would run a "regulated course according to acknowledged laws, if it be "driven to a high inflammation or sphacelus, no longer belongs to the original stock, and is emancipated from those "laws; so the violent actions of the above fever impair and "destroy the animal functions by which its crisis and remissions are regulated, or speedily engender a new disease; as "new as the conversion of an ordinary venereal chancre into "a phagedenic slough, through the application of a potential "cautery."

I may refer to the section on *Bilious Fever*, in the first edition of my work, for a similarity of doctrine.

By *Malaria*, Dr. F. means to express something that is more decidedly than miasmata the product of underground moisture, which can only be sublimated, so as to produce its specific effects, by long-continued solar heat—a more subtle miasm, in fact, of which the surface gives no warning, but of which the existence is proved from its effects on habitations that are placed in the drought of the dry ditches of forts, no matter

how rocky or dry, if they are deep, and also of deep ravines. At Fort Matilda, in Basseterre, Guadaloupe, a well-raised artillery store-house and guard-room, placed in Bouchure, at the confluence of two of the ditches, was found to be utterly uninhabitable. The same malign influence affected the houses that were placed opposite the deep ravines of rivers, no matter how pure and pebly the channel, as also all the dwellings situated on the leeward base of the mountains.*

It would also appear that these effluvia, during certain states of stagnation of atmosphere, as during the sultry calms of the hurricane months in the West Indies, *accumulate* in the dirty, ill-ventilated streets of West India towns, to the danger of all who are unseasoned to their influence. Here *strangers* will have the highest degree of ardent fever.

It is probable, too, that the healthiness of seasons in unhealthy climates, depends less on *the amount* of heat and moisture, than on the *ventilation* of the climates by powerful, regular trade winds, like the trade winds between the tropics; for whenever these have been withheld for a time, the accumulated morbific emanations from underground moisture will act upon the human body, like the accumulated typhoid principles in crowded hospitals, when undiluted with a due proportion of atmospheric air.†

On the Fever of Mariegalante, in the West Indies, communicated to the Author by D. J. H. Dickson, M.D. F.L.S. *&c. of Clifton.*

Sec. II.—The history of the fevers at Mariegalante, from July to December, 1808, is not only well calculated to shew the destructive powers of concentrated marsh miasmata, in tropical climates, at certain seasons; but also the modifications of fever which arise according to intensity of cause, locality, atmospherical viscissitudes, epidemic influence, or degree of constitutional predisposition. The difference of effect, however, as marked by difference of type, or anomalous appearances, is here particularly worthy of attention, because the

* See the Section on Sicily.

† See Dr. Fergusson's paper in the *8th vol. Med. Chir. Transactions*, from which the above has been abstracted and condensed.

men were limited to a small space, insulated, and exposed to the same causes which were strictly local and indigenous, but affected by differences of temperament or habits, degree of habituation or exposure, and other relative circumstances. I can, however, only propose here to give a hasty and imperfect sketch of the sickly period in question, owing to deficiencies in the reports during the illness of the successive medical officers, and the space and time it would occupy minutely to analyse those in my possession. For some months after the capture of the island, the Marines composing the garrisons enjoyed a very fair degree of health; but from the beginning of July (the usual commencement of the sickly season there), after heavy rains succeeded by intense heat, fever became daily more frequent in occurrence, and aggravated in character. Upon my arrival on the 29th of the same month, I found the disease had made such progress as caused me to entertain the most painful apprehensions for the fate of the garrison. It originally consisted of only 350 men, and there were then 150 on the medical list, 40 of whom were affected with fever, 15 with dysentery, and 75 with ulcers, many of which, owing to the sickness of the surgeon, and the accumulation of cases, had attained a considerable degree of malignancy. Of the first disease, many had the yellow or endemic fever of the West Indies, in its most aggravated form, with black vomit; in others, it was of a more protracted character, and with symptoms more resembling those of typhus; while the remainder had remittent or intermittent fevers. On my first view of the sick, and of the low swampy situation of the town of GRAND BOURG, together with the season of the year, I was impressed with the most unfavourable anticipations, and represented to the Commander in Chief, that although I had expected to find much sickness at Mariegalante, I had not been prepared for the conclusion I was then obliged to form—viz. the total reduction of the strength of the garrison in the course of the hurricane months, unless the sickness could be arrested. That my prognostic was but too accurate will appear in the sequel. The closest inspection, on the following day, tended but to confirm and extend this conclusion, and my report expressed the grief with which I offered my opinion that the garrison would be shortly incapaciated for any duty; that the only chance of averting this depended on the adoption of measures of the greatest promptitude and energy; and that the presence of the Commander in Chief on shore would greatly facilitate

the carrying them into effect; a suggestion with which Sir Alexander Cochrane, with that heart-willingness which characterised him in every instance, where the health of the men was concerned, immediately complied.

The first object was to remove, as far as it was possible, both the sick and the well from their unhealthy habitations; rendered still more noxious by the accumulation of disease; and, where this could not be effected, to cleanse and purify the apartments, and to arrange, and separate the sick, &c. The next considerations were the clearing away of whatever was filthy and offensive around them; the employment of Negroes for this, and various other fatiguing and dangerous duties; the avoiding of exposure to the sun and rain; a more regular supply of fresh diet, and of wine or spruce beer to the troops, instead of rum; and lastly, the adoption of every measure which could prevent the facility of intemperance, and excesses with noxious new spirit. A more elevated situation was procured for the convalescents, on the hill; and a large house on the sea shore to the eastward, and consequently generally to the windward of the swampy grounds, was selected for an hospital; but the latter, owing to reports of its insalubrity and other difficulties, was never occupied; though I was decidedly of opinion that the removal of the men, anywhere, was preferable to their remaining in their former situation, which had been replete with disease and death. After making those arrangements, Mr. Mortimer, surgeon of the flag-ship, who had handsomely volunteered his services, was left in charge of the sick; and according to his official report, published in the Nineteenth Number of the Medico Chirurgical Journal, for the first two or three days such was the amendment produced by the measures concerted, that a considerable diminution of disease was calculated upon. But alas! the remission was but temporary: the men could not be removed beyond the reach of noxious exhalations, emanating in all directions from the low swampy ground covered with rank vegetation; the concentration of the marsh miasma; and the predisposition favoured by apprehension and irregularities, increased daily, and the fever proceeded with augmented power and rapidity, until it had swept off half the garrison. The aspect of the country, Mr. Mortimer observes, "seems particularly favourable to such exhalations. On viewing it, you almost constantly find hills of easy ascent, intersected by lesser declivities, and these on both sides encompassed by swamps; so that

whether in the interior, or the town, sickness nearly equally obtains." The enemy taking advantage of the disabled state of the garrison, attacked the island on the 23rd August, and although in a short time it was re-captured, and reinforced by fresh detachments, the sickness was necessarily much increased by the fatigue, exposure, and irregularities incidental to warfare. Many of the old as well as the new troops were seized with the fatal fever: indeed the worst cases were second attacks, brought on by exposure and excesses, and by the end of September, this ill-fated little garrison had lost by disease 234 men. As a most faithful description of the yellow fever by Dr. Mc. Arthur appears elsewhere, and as Mr. Mortimer's report of the endemic in question has been inserted in the Medico-Chirurgical Journal, as above noticed, I do not propose giving any further account of it here.

The only treatment which appears to have had any effect was that of bloodletting and purgatives, if resorted to sufficiently early; but even these measures were inefficacious, unless employed at the very commencement; and after what has been said, it is hardly necessary to add that the power and rapidity of the disease were too often such as to set medical controul at defiance: indeed in its highest grade, there is so little chance and time for the interposition of our art, that it may almost be considered irremediable; and, in some instances, men who complained of headache and giddiness in the afternoon, were dead by the next morning.

Mr. Mortimer was taken ill before he had finished his report, and was received on board the flag-ship in a state of extreme danger, from which he with difficulty recovered. He was succeeded by Mr. Waller, (who like his predecessors suffered much from the unhealthiness of the situation), and from whose communications chiefly I have extracted the remaining account of disease at Mariegalante. The yellow fever declined towards, and indeed altogether ceased by the end of September, when the season became rainy; and it was succeeded by cases of a protracted description, extending to the period of twenty days, or longer; and though characterized by some peculiar and anomalous appearances, with symptoms much resembling those of typhus. During the months of October and November, the weather was wet, and squally; and there was comparatively but little fever, with the exception of quotidian intermittents, which were by no means severe, and yielded readily to the moderate use of

bark. In December, the tertian became the prevalent type, but early in this month intermittent paroxysms occurred of an alarming character, and of such intensity that, in some cases, after one or more attacks the patient was carried off by coma and convulsions. In this way seven men died within twenty-four hours; and some even in a much shorter period, so as at first to induce a suspicion of poison. The symptoms may in some have been partly attributable to their having taken a large quantity of rum, with the view of preventing the ague; but they also occurred in others who had not tried this pernicious experiment. In one man who died in about two hours, a green sediment, supposed at first to be some poisonous vegetable, was found in the stomach. In others who were opened however, no such matter was discovered; but only a bilious looking fluid, similar to what was ejected by many, but not by all before death. In almost every dissection a large quantity of this fluid was found in the stomach, dying every thing it touched of a very deep yellow colour—very turbid, saponaceous, adhering to the sides of the vessel, with an odour of ammonia so strong and pungent, as to excite the olfactory nerves, and appearing to be particularly acrid; but not at all resembling the matter with the green sediment abovementioned, nor the black vomit of yellow fever, nor even the yellow fluid which is first thrown up in that disease. The action of this fluid upon the nerves of the stomach seemed to be the cause of the comatose symptoms which came on, soon after the invasion of the paroxysm, or at the commencement of the hot stage; as, whenever an emetic was previously given, a considerable quantity of it was brought up; but the remedy seemed also to increase the secretion of it; for as much would be ejected in the course of the succeeding day as had been discharged by the emetic. In the greater number, the comatose symptoms did not appear till after the patient had sustained two or three paroxysms: many, however, died in the first paroxysm, when the coma did appear, but more in the second paroxysm. To this account of the severity of the disease, I can well give credit, from the cases which fell under my own observation, while at Mariegalante. In one instance I recollect to have seen a man in whom, not only, as mentioned by Senac, the hot and sweating stages occurred together, but all the three stages seemed to be concentrated at once; for while his teeth were chattering and his body shivering from the sensation of extreme cold, his skin felt excessively hot to the touch, and

large drops of perspiration were standing on his face and breast.* When the disease was of the Tertian type, Mr. Waller observes that the symptoms lasted about thirty-six hours, or until about two o'clock in the morning of the day after the attack; when of the quotidian type, the duration was about eighteen hours, and somewhat milder, but the intermissions being only six hours were less complete than in the Tertian paroxysms. In the latter part of the paroxysm the pulse and skin sunk remarkably low, as in the fever about to be described; but they rose again, during the apyrexia, nearly to the natural standard, and the patient then complained chiefly of debility. In every instance where the patient survived the second shock, he recovered ultimately but seldom without having had six or seven paroxysms. In this disease, denominated by Mr. Waller, "*the comatose intermittent*," his practice was to give an emetic, an hour before the accession of the attack, which appeared of considerable service in mitigating it:—a blister was applied to the head, and sometimes between the shoulders, and the bowels were kept very open with calomel. His principal reliance however, was on mercurial frictions repeated every hour; and by this remedy he thinks many lives were saved, though in one instance only was ptyalism the consequence of it. When the paroxysms ceased, it was discontinued; and the bark was substituted. The patients continued long in a state of convalescence; and frequently shewed symptoms of diseased spleen. Towards the end of November the northerly winds set in; vast quantities of rain fell during the night; and soon afterwards, that is early in December, fever became prevalent. This fever occurred at the same period, and in some respects bore a strong similitude to the aggravated intermittent above described; but it was of a different type, and appeared in duration and symptoms to be intermediate between yellow fever and typhus. As this fever was characterised by the supervention of extraordinary symptoms, viz. coma, reduction of temperature, and periodical vomiting, I shall give a more particular account of it, as it is described, though more summarily than in the minute, and I have every reason to suppose, faithful report of Mr. Waller.

Description of the Fever.—The patient complains of being taken ill in the evening; but, upon more minute enquiry, it

* Besides Senac; Cleghorn, Stork, Pringle, Frank, Burserius, and various other authors adduce instances where the order of the paroxysm was deranged, or some of the stages wanting, and of various anomalous appearances in intermittents.

is generally found that a slight head-ache was felt in the morning, with a sense of lassitude and pain in the limbs; which symptoms were relieved at dinner, but returned, in an increased degree, about sunset. Slight rigors then occur, and are often felt for some time after the heat has accumulated on the surface of the body; they generally continue about an hour, when the temperature becomes steady; though at a lower point than is usual in the commencement of yellow fever, and considerable thirst and anxiety succeeded, while the face and general surface become flushed; and the blood vessels of the eye turgid. The pulse is now full, firm, and frequent; but the skin, though hot, is seldom without some degree of moisture and softness. Perspiration usually comes on early, and continues free and general, during the remainder of the paroxysm, which ceases about two or three hours before daylight. The patient then falls asleep for some hours, and awakes refreshed, and with a considerable remission of all the febrile symptoms; the pulse is now less full; but still frequent, and often irregular; and the tongue, which was merely white before, is found thickly coated with mucus, whitish round the edges, but very foul and brown in the middle. The patient complains now only of debility, and a dull heavy sensation of the head increased on motion, and shews a propensity to sleep. The apyrexia continues till about noon, when the same febrile symptoms recur, but increased in violence and duration. The remission next morning is less complete, and the exacerbation comes on earlier. In general there is no third remission; the fever becomes continued and is early accompanied by great irritability of stomach, beginning with a vomiting of bilious matter, and afterwards of every thing that is taken, with very distressing retching, uneasiness, and pain when it is empty. The dull heavy pain in the forehead, with vertigo on motion, is always complained of, which, with the pains of the limbs, generally continues through the disease. The bowels are for the most part relaxed, sometimes very loose, and the stools watery. The patient most frequently continues in this state four or five days, when a new train of symptoms appear, which give the distinguishing character to this fever; sometimes however, they appear earlier; at others not until signs of convalescence have occurred. The first symptom is a remarkable degree of stupor; the patient displays the greatest indifference to every thing around him; is with difficuly aroused to answer questions, or to take any thing; and seems much disconcerted at having

been disturbed. The pulse which was before tolerably full and firm, sinks rapidly, and throbs with a quick unequal motion under the finger; sometimes it is scarcely perceptible, and not unfrequently it cannot be felt at the wrist at all. The heat of the surface too, generally subsides, but in this stage it is very variable, though there is reason to believe that if the patient were left to himself he would become quite cold; indeed this coldness of the skin is very remarkable in a great number of cases; and in some appears to be beyond what is felt in the living body under any circumstances; yet the patient does not appear to feel any uneasiness from it. With this extraordinary reduction of temperature, the skin is not anserated, but cold and clammy; and it sometimes continues for several days. The tongue is found to be dry and hard, and the teeth and lips become covered with a dark-coloured fur. The patient appears to sleep much during the day, or rather he lies in a kind of stupor without sleeping, but at night is, for the most part, delirious. He now seldom complains of pain, or only in the region of the stomach, where it is sometimes very severe. The vomiting, at this period, often subsides; but frequently also it comes on every day about the same time, and is attended with very painful spasmodic contractions of the stomach. This periodical vomiting observes its periods with great regularity; is a very untractable symptom, and little susceptible of alleviation, by any remedy that has been tried. The vertigo is also exceedingly distressing, and increases so much, in an erect posture, that the patient instantly falls down; and even when recumbent he complains of the giddiness or a very unpleasant sensation in the head. It sometimes continues after the other symptoms have disappeared, and is always extremely tenacious. The symptoms just enumerated continue three, four, or five days; and then gradually subside. But this is, though the most favourable, not the most frequent termination; it oftener happens that the stupor increases to a state of complete coma, or accompanied by muttering delirium, subsultus tendinum, and involuntary discharges. The pulse sinks until it can be no longer felt any where; the whole body becomes cold and cadaverous; and, in some cases, of a deep yellow colour, with no other signs of life than a feeble respiration. Sometimes, at uncertain intervals, the pulse and heat rise, and the patient becomes anxious and restless for two or three hours; then falls again into the former state. But these changes may be effected by the remedies employed, as it is more than

probable that they would not so often appear if the patient were left to himself. In this stage, death very frequently happens; but however bad the patient may be, when the formidable symptoms continue above forty-eight hours, it affords a strong presumption that he will recover; and this sometimes has taken place after he has lain in this state for four days. In such instances, when the system emerges from torpidity, the coma first disappears by degrees, and the pulse gradually rises; but the patients continue for a long time in a state of excessive debility, and not unfrequently fall victims to second attacks, or to dysentery. This disease first attacked many of those who had suffered from concentrated fever in July and August; its average duration is twelve days when it terminates in a quotidian intermittent, convalescence, or death.

It may appear but little in favour of the plan of treatment, to state that out of sixty-one seized with this fever, in December, half of them died; yet when those very formidable symptoms are taken into consideration, it is but fair to infer that remedial measures were not only employed with much advantage in the early, but also in the ulterior stages of the disease, from there being time to put them in practice, according to the existing indications. In the early period of the disease, Mr. Waller observes, it was always considered necessary to lessen the excitement by bleeding, purgatives, and the other parts of the antiphlogistic regimen. But as this stage of excessive excitement was in some cases of much shorter duration than in others, it frequently happened that the patient did not complain sufficiently early to receive much benefit from depletion, or even to bear any abduction of blood. Indeed symptoms of exhaustion sometimes appeared even in the first paroxysm, and, in a number of cases, no remission supervened; but whenever it was authorised, the lancet was invariably and freely used in the first stage, and invariably with advantage; in every instance, the bowels were well evacuated by purgatives, and by large and frequent doses of calomel. Emetics, he says, were frequently tried, at first, but not with so good an effect as was expected from them; and but a very short relief from the nausea was experienced after their use, when this symptom existed, in a considerable degree, in the first stage. Upon this point I shall wave any remarks, as occasionally they may have been useful in the modified disease under consideration; but in the inflammatory and rapid yellow fever, I am of opinion that the exhibi-

tion of emetics, or of antimonial or other nauseating medicines, cannot be too strongly reprobated. In the present case, it was only in the first attack, or during the exacerbation, that the patient could bear any evacuation, except by the bowels, which were always kept very open, so long as the pulse was at all full, or retained any firmness; but, when the stupor supervened, he could no longer bear any debilitating process. To allay the gastric irritability, blisters, mercurial frictions, effervescing draughts, small pods of capsicum, &c. were employed, but generally with very little effect. The best remedy seemed to be a grain of opium in a pill, repeated according to the vomiting; but even this was often rejected. So soon as stupor or coma appeared, stimulants were resorted to; blisters to the head, wine, camphor, ammonia, and mercurial frictions; and, in the low state above described, there is no doubt that the friction itself, as well as the remedy, was of service. The delirium was generally immediately relieved by blistering the head. The formidable degree of coma, Mr. Waller observes, mostly came on in the morning early; but he was unable to ascertain whether it was preceded by any peculiar sensation, by which its approach could be certainly known. The prognosis was unfavourable in proportion to the intensity of coma, reduction of heat, and gastric irritability; little dependence could be placed on the circulation. The danger was great when the patient lay in a state of reverie; much greater when there was delirium in the day time, than when in the night. In the comatose affection, he speaks in the most favourable terms of mercurial frictions, and adduces their success in some cases considered desperate, when the patient had been lying in this lethargic state for four, five, or more days, with the pulse, for many hours, imperceptible, and the remarkable coldness of skin above described. These frictions required to be frequently and perseveringly repeated; and latterly he was in the habit of rubbing in a drachm or two drachms of the strong ointment every hour; which method seemed preferable to any other. To his opinion of the value of mercury in protracted or congestive cases, after the active stages of fever are past, and particularly to its efficacy in visceral obstructions and derangements which are the sequel of certain fevers, I perfectly subscribe. In many such cases, it is not only a most valuable resource, at a period when we have no other indication to pursue, but also, perhaps, where no other remedy would be successful; but of its inutility,

except as a purgative, where there is *high febrile action*, as in the early stage of concentrated yellow fever, I am fully convinced; and trust I need not here deprecate the wasting of those precious moments, when only the disease can be controlled, in fruitless attempts to institute the mercurial action. With respect to the combination of this with the depletory plan of treatment, I am inclined to think that the mercury has often enjoyed a larger share of the credit than it has been entitled to; because in many such cases, it has been indebted for the power of exerting its specific action, to the depletion, which, at the same time, has been employed. When we can command a warm bath, in cases like those above, I need not say how much it would contribute to the object in view: it is to be regretted that there does notappear to have been an opportunity of ascertaining the actual temperature of the skin by the thermometer. With respect to the causes of this fever, Mr. Waller does not offer any decided opinion. It was, at first, attributed to the Northerly wind wafting in a very offensive odour from the burying ground; owing to the hasty and imperfect inhumation of the bodies, which was accordingly remedied. The disease certainly began to prevail after the Northerly winds set in; but it is unnecessary to add any ætiological observations after what has been said of the abundant sources of deleterious exhalations at Mariegalante.

D. J. H. Dickson.

P.S.—Dr. Dickson has to apologize to Mr. Waller for the publicity here given to the above interesting document, without previous communication with its author. But the fact was, that he did not know Mr. Waller's address; and the press could not be stopped, without great loss and inconvenience to the author of the work in which the document is inserted. He chose therefore to risk the non-observance of a punctilio, rather than prevent the diffusion of a useful fact or interesting phenomenon in medical science. The same apology is due to Mr. Warden for the publication of his observations on the Chesapeake Endemic; and Dr. D. trusts, that these Gentlemen will consider the foregoing reasons as a sufficient excuse for the steps here taken.

TETANUS.

Sec. III.—This *opprobrium medicorum*, though an occasional sojourner in all climates, has its principal seat and throne between the tropics. The disease, however, is equally fatal, though not near so frequent, in a cold, as in a warm climate. According to my own experience, and that of most of my naval and military friends, the *traumatic* is greatly more dangerous than the idiopathic species, though this sentiment does not accord with that of Dr. Morrison, the latest writer on the subject.

The *Symptomatology* of Tetanus is by no means necessary in this place, since it is impossible for the veriest tyro to mistake the disease. Some pathological and therapeutical observations only will here be introduced.

Pathology.—Dr. Morrison, in his recent treatise on Tetanus, asserts that dissection has thrown little if any light on the seat or nature of the disease. But some late papers and investigations would seem to diffuse a ray of light on the obscurity of this pathological tract, and induce us to believe that we have too long neglected the morbid anatomy of the spinal cord, and of the medulla oblongata, in diseases attended with violent spasmodic affections. Dr. Sanders, of Edinburgh, has long laboured in the developement of this dark subject, and not without great success. The harmonious balance, not only of the circulation in itself, but in its relation with the nervous system, has too long been overlooked; but new light is now breaking in upon our minds from the tomb. The *inequilibrium* in the balance of the *excitement*, which exists in almost all diseases, is here evinced, in characters that can hardly fail to be understood. While the class of voluntary muscles is in complete spasm, various organs—more especially the chylo-poetic viscera, are utterly torpid.—This inequilibrium in the balance of the excitement shews itself, even before the developement of spasms, in the torpor and costiveness of the alimentary canal *precursory* of, and co-temporaneous with Tetanus, as was sagaciously remarked by that accurate observer of nature, Dr. Dickson, in the 6th Volume of the Medico-chirurgical Transactions.

We must therefore look to the origins of those nerves which supply spasmed muscles, for the immediate seat of the mis-

chief; and there it will be found, without a doubt. Dissections of the base of the brain, medulla oblongata, and medulla spinalis, have not, till lately, been prosecuted with any thing like accuracy.

Dr. Reid has now forcibly drawn the attention of the medical world to this subject, and it will, no doubt, be well investigated. It has long been remarked, indeed, that in Tetanus the natural functions are little affected, and the same may be said of the intellectual functions, and those muscles and organs supplied by the nerves of sense. These considerations naturally lead to the conclusion that the thoracic and abdominal viscera are not primarily affected, and that the origin of the disease is not in the nervous substance supplying those organs—in short, that the cerebral and ganglionic systems are only drawn in *subsequently*, and that the spinal cord is the original and principal seat of Tetanus.

Case in elucidation [from Dr. Reid].—A boy 14 years of age, after receiving a severe bruise in the toes of the right foot, was exposed to the vicissitudes of the weather in the month of February. He was seized four or five days afterwards, with tetanus, and died in thirty-six hours. *Dissection.*—Viscera of the abdomen and thorax perfectly sound, as were all the muscular parts. On opening the spine, *from the back part*, and on raising the nervous mass (with its dura mater entire) from the spine, "there appeared a considerable effusion of blood into the cellular tissue, connecting it to the upper lumbar, and lower dorsal vertebræ. A similar effusion occurred also along the bodies of the upper dorsal and two lower cervical vertebræ. On slitting up the dura mater on the anterior surface, the nervous mass appeared highly vascular, and the vessels of every description remarkably tortuous. The only appearance in the nervous substance itself, was a deeper tinge than natural in its cortical and medullary parts."

From these appearances, corresponding with the investigations of Dr. Sanders, it follows that Tetanus is radically an inflammatory disease. But general blood-letting here will not be near so efficacious as local abstractions of blood from the spine—blisters—purgatives—and finally, mercury and opium to equalize the balance of the circulation and excitement. The following observations from Dr. Morrison, the latest writer on tropical tetanus, may be appropriately introduced here.

Dr. Morrison was led to compose his present Treatise on Tetanus, from having had considerable experience in that

disease, during an eight years practice in the Colony of Demerara, where it is of frequent occurrence. The land of this part of the South American Continent is low, flat, and marshy, abounding with swamps, and, with the exception of a stripe along the banks of the Demerari, is covered with trees of various dimensions, whose roots, for a great part of the year, lie bedded in water. The prevalent diseases are intermittents, fever, hepatitis, enteritis, rheumatism, dysentery, and, among children, hydrocephalus.

Dr. M. does not look upon Tetanus, even the traumatic form, as so very dangerous a disease, in tropical climates, as authors have represented it. He has witnessed many instances of recovery both from traumatic and idiopathic tetanus, and, strange as it may appear, the instances of cure in the *former* have been nearly as numerous as in the *latter*. In upwards of twenty cases of this disease which he witnessed among negroes, the pulse was in no instance, accelerated in the manner related by Dr. Parry. He has never known it above 98, whether the termination was favourable or fatal. The following prognostic passage we shall transcribe.

"When the disease comes on gradually; when for the first three or four days the muscles of the jaws are solely affected, and that perhaps not in any alarming degree; when the abdomen is not preternaturally hard, or the bowels obstinately costive; when the skin is moist and moderately warm, and above all, when the patient enjoys sleep, we may (by the means hereafter to be spoken of) entertain strong hopes of an eventual recovery. An increased flow of saliva where mercury has, or has not been used, is always to be regarded as favourable; the less the general air of the countenance is changed, the better. On the other hand, when the attack is violent and sudden; when the muscles of the neck, back and abdomen, are rigidly contracted; when the patient complains of a shooting pain from the sternum towards the spine; when the belly feels hard like a board, and the least pressure thereon produces spasmodic twitchings or contractions of the muscles of the neck, jaws, &c.; or when the same effect is brought about by the presentation of any substance (solid or fluid) near the mouth, we have much reason to fear a fatal termination. Spasmodic startings of the muscles set in sometimes early in the disease, and recurring every eight or ten minutes, are to be regarded as very unfavourable." p. 29.

The only disease which tetanus can be confounded with, is rabies contagiosa. In the latter, however, there is gene-

rally fever; frequently increased heat of the body. In rabies contagiosa, vomiting is common at the commencement; not so in tetanus. The delirium too of hydrophobia is absent in tetanus. The shooting pain from the sternum to the spine is seldom wanting in tetanus or present in the other.

Treatment of Tetanus.—Dr. M. believes, that spontaneous cures do occasionally take place in tropical climates. One decided instance of traumatic tetanus giving way to the efforts of Nature fell under his own observation. The treatment of idiopathic and symptomatic tetanus is considered the same. For although it is common and proper in the West Indies to apply some stimulating substances as ol. terebinth. or the like, to recent wounds, together with emollient cataplasms, so as to induce free suppuration, yet when constitutional tetanic symptoms have once commenced, there is little or no dependence on local treatment. By way of prevention, Dr. Clarke advises a slight mercurial ptyalism to be brought on after wounds in hot climates, or under suspicious circumstances. For the same purpose, the complete division of half divided nerves, tendons, &c. might be proper. The Spanish physicians bathe the wound, for an hour or more, in warm oil, while some subsequently apply lunar caustic, superacetate of lead, &c. The principal general remedies that have been recommended are, the cold affusion, mercury, opiates, wine and bark, the warm bath, cathartics, blisters, anti-spasmodics. We shall not stop to notice the history of each of these remedies, but give the substance of Dr. M.'s own remarks and experience. During the Doctor's first three years residence in Demerara, and in the first eight or ten cases, the *cold affusion* was invariably used, but with so little success that it was ultimately left entirely off, and the warm bath substituted.

Mercury.—Spontaneous salivation has often been observed in tetanic patients whose cases terminated favourably, hence probably the first idea of using mercury. In hot countries tetanus is seldom so rapid as to prevent the introduction of mercury in quantity sufficient to salivate, before the disease runs its course, whether favourably or fatally; and, as in all climates mercury interferes not with other remedies, Dr. M. thinks its administration ought never to be omitted.

"I undoubtedly have had many examples of the good effects from mercury in the cure of this disease. Four grains of calomel given two or three times a-day, with three or four drachms of the ointment well rubbed on the neck and spine

night and morning, I believe to be excellent practice. A much larger quantity of the ointment may be used on different parts of the body; indeed, the more continued the friction, the better. The constitution labouring under this disease, will mostly appear as proof against the usual effects of this medicine; but when salivation can be brought about, it will in a great majority of cases be found to be attended with the happiest consequences. Allowing the spontaneous salivation which sometimes occurs, to be more the effect than the cause of the cure, still we should be inclined to throw in large quantities of mercury, merely with a view of bringing on any different action in the system."

The submuriate of mercury with scammony or jalap as a purge is also recommended by our author.

Opium.—This appears the sheet anchor of our author in this disease. He has met with more than a dozen cases where the cure of tetanus could be fairly attributed to this medicine; and he has met with no instance of recovery in which he did not conceive that it bore a principal part. It must be given, however, in very large doses, the system under tetanus being little affected by doses of opium that in other circumstances would produce striking effects.

"A practitioner," says Dr. M. "for whose acuteness and discernment I have great respect, gave to an old man, in my presence, who was in an incipient stage of this disease, about *half an ounce* of tincture of opium in four ounces of rum, as a *first dose*, directing, at the same time, the spirit to be frequently repeated, and the man got perfectly over the complaint in a few days." 57.

Dr. M. directs that an adult should commence with one hundred drops of the tincture (bowels being opened), increasing each succeeding dose one-third every two hours, unless sleep or stertor in the breathing ensue; ordering at the same time, wine or ardent spirits, in as large quantities as the patient can be induced to swallow. A pint of spirits, or double that quantity of wine in the twenty-four hours will not be too much. Tincture of opium is also to be rubbed on the spine.

The Warm Bath is regarded by our author in a favourable point of view. It has afforded much present relief on several occasions under his own eye, where the spasmodic twitchings were frequent and troublesome. He depends very little on it, however, and justly observes, that the exertion or movement which the patients must undergo, in order to

get into the bath, will often more than counterbalance any good effects that can be expected from it. Patients are so alive to all external impressions, that the least exertion is often sufficient to excite violent spasms. On this account, the patient should be kept as quiet as possible, and very few questions asked him. The chamber should be kept darkened, and every thing tending to excite mental exertion avoided.

Blisters, though recommended in high terms by a few medical practitioners, can only be looked upon in the light of adjuvants. The course of the spine appears the best site of their application.

Bark and Wine.—Dr. M. recommends, that during the exhibation of opium, large quantities of wine or diluted alkohol be administered, in order to second its effects.

Recapitulation.—"The bowels should be kept as free as possible. We must endeavour to bring about an operation every twelve hours. This, even by the aid of strong cathartics, or purgative injections, will be found very difficult to be obtained; the sphincter ani sometimes scarcely admitting the introduction of a glyster-pipe, and the exhibition of the strongest purgatives may often be attended with little or no effect. Sulphate of soda, jalap and calomel, scammony, pil. aloes cum colocynthide, &c. are as proper for this purpose as any other, aided by stimulating clysters, such as solution of muriate or sulphate of soda, with olive oil; the resin of turpentine, suspended by the yolk of an egg; solutions of soap, &c. I have found it, on two or three occasions, impossible to open the bowels freely, till after large quantities of opium had been taken, which seemed to bring about a general relaxation; or until the system had been evidently under the influence of mercury; and, indeed, these are the two medicines on which we are to place the greatest confidence, in the treatment of this disease: they must be given, however as before remarked, in large doses, and frequently repeated. I once gave a patient, who is, I believe, still living, ten grains of opium and twenty of calomel, in pills, and five ounces of tincture of opium, in wine, all in the space of twelve hours.

"Next to opium, I certainly look on the preparations of quicksilver as the most valuable. Large quantities of the ointment may be rubbed in on the spine, neck, legs, &c. with repeated doses of submuriate internally. Wine and ardent spirits should be given freely; indeed, the constitution here appears as insensible to their usual effects, as to those of opium; and quantities, which in a state of health, would

produce stupid intoxication, now neither exhilarate the spirits, nor disturb that serenity of mind so conspicuous throughout the disease.

"The *warm bath* will often be found a useful auxiliary; when we expect to derive advantages from it, the vessel used should be so capacious, as to allow the patient to be as little confined as possible, and the water should be sufficient to cover the shoulders completely. I have found a common rum puncheon sawed across at the centre, very convenient for this purpose.

"I have generally used blistering plasters, but confess I have never experienced much benefit from their application.

"When the disease is conquered, the patient should take wine and bark for many weeks." p. 70.

On the above passage I would remark that the local abstractions of blood by leeches and cupping from the neighbourhood of the spine, with subsequent blisters there, are not inconsistent with the plan of treatment recommended by Dr. Morrison. For it must be remembered that such is the unequal distribution both of the blood and excitability in the system, under this disease, that one part is completely torpid while another is on the point of extravasation from turgescence or inflammation. It is evident from this view of the affair, that we must stimulate the torpid organs at the very moment we are employing sedatives, and counter-irritants, or abstracting blood from the congested parts.—Hence too the great value of purgatives and mercury. The former bring back the excitement to the abdominal viscera, and powerfully determine from the spine: the latter sets all the secretory and excretory apparatus to work, while it equalizes the circulation in every part of the system.

Copy of a Report, transmitted to Dr. Dickson, on his joining the North American Fleet, in June, 1814.

H. M. S. Albion, *off Tangier Island, July* 1, 1814.

Sir,—A small tract of your's addressed to Naval Surgeons on the Leeward Island station, in the year 1810, was put into my hands a few days ago, and which I read with great satisfaction. The anxious solicitude which it conveys for the

public weal induces me to forward to you a few lines, explanatory of the autumnal epidemic of this climate, which made a formidable attack upon us last season, while operations were carrying on within the banks of the Chesapeake.

Yours respectfully,

WILLIAM WARDEN.

Symptoms and treatment of the Autumnal Endemic generally prevalent during the months of July and August, in the Chesapeake, by WILLIAM WARDEN, ESQ.† *(communicated by Dr. Dickson, Physician to the Fleet.)**

SEC. IV.—About the beginning of August, 1813, a fever of a remittent type made its appearance in the fleet, while at anchor off Kent Island, in the Chesapeake. It was confined solely to those who had communication with the Island, and in the Sceptre, the marines who were employed on shore on duty, were the principal sufferers.

There was nothing perceptibly contagious in its nature; and by every information I could gain, it appeared to be the autumnal endemic of the climate, the temperature of which, at that time, ranged from between 80 and 85 of Fahrenheit's scale,—nay, by some it was observed to rise to 92°.—The paroxysm at the beginning was generally ushered in by a cold stage, terminating in a profuse perspiration; but this mode of commencement in the majority of instances seldom continued longer than a couple of days; the hot stage becoming afterwards the first part of the paroxysm. Neither did a relaxation of the surface always follow, sometimes the remission being only evinced by the diminution of temperature, and the decrease of the fullness and frequency of the pulse. The paroxysms (although evidently favouring a tertian return) did not always observe a stated period; neither did their frequency of attack, in every instance, correspond; sometimes one, and often two being perceptible in the 24 hours; the first having its accession at noon, and the second at an uncertain hour in

† The ingenious author of the very interesting letters from St. Helena.

* See note to the Mariegalante Fever, page 369.

the night. In every instance there was a marked determination to the head, occasioning in some, delirium, and in others head-ache, giddiness, and stupefaction. Next followed a sharp cutting pain across the epigastrium, attended by some slight oppression of the organs of respiration, *indicating a sympathetic affection subsisting between the abdominal viscera and the thoracic*, rather than any peculiar determination to the latter;—also pain about the back and loins, with spasms of the calves of the legs. The countenance, at commencement, was generally flushed; but in a few days assumed a deep sallow hue. The eye partook of the same colour; and in a few cases the pupil became dilated. Tongue always foul, and thirst, at times urgent. Bowels inclined to be costive. Urine discoloured. The pulse was generally quick, full, and strong at the commencement; but in the progress of the disease varied considerably; being full in some, quick and small in others, and in a few not more than natural. Despondency and the language of complaint were a marked indication of an aggravated disease.

A few of the first cases were to appearance slight; partaking more of a sporadic febrile action than any specific disease; therefore they were treated on application with emetics, purgatives, and cold affusions; and the exhibition of calomel and antimony, with bark and quassia during the remissions.—These, with blisters to the temples, were principally trusted to;—but, as the disease became better marked, and its nature and cause more fully ascertained, repeated bleeding and purging at the commencement were found productive of more permanent benefit; and, in course of time, entirely superseded the use of the *cold affusion* and emetics, which were ultimately found to be either prejudicial or of little or no utility. The bleeding was always followed by a reduction of temperature; and if syncope came on, by a relaxation of the surface also. It evidently facilitated the mercurial action on the system, and seemed to prepare it sooner for a due exhibition of the bark. The soreness of the mouth was always marked as a sure symptom of convalescence, but while I pronounce this as a fact in every case where slight ptyalism was produced, I do not subscribe to the infallibility of this active agent (mercury); rather would I affirm that the system of depletion subdued the disease, and a peculiar lively action of the absorbent system (hitherto torpid) immediately following, soon affords both patient and practitioner a sure characteristic of the termination of this formidable disease. The convales-

cent stage became more protracted than I could have any belief of; and perhaps this circumstance may be accounted for from our proceeding to the southward, where we experienced no diminution of temperature, and throughout the whole stage of recovery, we were limited to the ship's allowance of provisions, assisted by the few necessaries remaining at that time in my charge. To the best of my recollection we had 54 cases of bilious remittent fever. Of that number 52 recovered, and two died.—The Sceptre arrived at Bermuda on the 20th of September, when few or none remained confined to their beds; therefore it was found unnecessary to remove any of them to the naval hospital.

P.S.--In four days after quitting Kent Island, the fever began to assume a formidable appearance: and 294 cases were reported in the fleet, including those in the Sceptre; a survey was therefore held on the 3rd of September, 1813, by two naval, and a military surgeon (pursuant to an order from Admiral Sir J. Warren, to enquire into the nature of the fever, and the best mode of practice), who, after visiting the Diomede, Diadem, Romulus, Fox, Nemesis, Success, and Sceptre; reported that the disease was the bilious, or autumnal remittent of the climate, marked by inflammatory or increased vascular action, with strong determination to the brain, and abdominal viscera; that the disease seemed checked by the mode of treatment, and the majority were recovering; that should the services of the troops be further required, they strongly recommended the removal of the worst cases from the troop ships; but that the disease did not appear to be of a contagious nature, as without a single exception, the cases were solely confined to those who had been exposed to marsh miasmata on Kent Island.

P. S. to the Western Hemisphere.

[*The Section on Endemic of New Orleans ought to have come in here, but was obliged to be postponed to the end of the work, as an Appendix.*]

PART III.

TROPICAL HYGIENE;

OR,

A CODE OF INSTRUCTIONS FOR THE PRESERVATION OF HEALTH IN ALL HOT CLIMATES.

ADAPTED TO GENERAL PERUSAL.

Prestat argento, superatque fulvum
Sanitas aurum, superatque censum
Quamvis ingentem, validæque vires
Omnia prestant.

As prevention is better than cure, it might seem more natural to have detailed the means of preserving health, before entering on the treatment of diseases themselves. This plan has accordingly been adopted by Dr. Moseley; but I think it an injudicious one. In describing *effects*, I have traced pretty minutely their *causes*; and in that way must have obviated a vast tautology in this part of the work. Besides, by exhibiting both causes and effects in one view, I am convinced that the salutary impression is always stronger. For example; could the gravest anathema, denounced with all due solemnity, against sleeping ashore on insalubrious coasts, excite half so much interest in the mind of an European, as the fatal catastrophe at Edam Island?—But another great point is gained by this plan. The various reasonings and remarks which accompanied the description and treatment of diseases, will enable even the general reader to comprehend, with infinitely more ease, the *rationale* of those prophylactic measures, which I am now to delineate; and which, at every step, will recall to his memory the deplorable effects resulting from a contempt of them. This is no inconsiderable object; for we all know the gratification which springs from understanding what we read. And, in truth, it is a pleasure—nay, it is a

positive advantage, to be able to explain, even on a *false theory*, the principles of a *useful practice*. But as theory, in this instance at least, is the legitimate offspring of experience, so, I trust, the superstructure is as firm as the foundation.

It has been remarked, by a very competent judge, "that by taking the general outline of indigenous customs for our guide, if we err, it will be on the safe side." This is a good rule; but, unfortunately, it is impracticable—by those, at least, who stand most in need of one. For, before we can become acquainted with these indigenous customs, it will be too late for many of us to adopt them; and could we see them at one *coup d'œil*, when we first enter a tropical climate, how are we to avail ourselves of them, unless they happen to be in unison with the habits of our countrymen already resident there, who would not fail to sneer at the adoption of any plan which had not the sanction of their superior experience. But independently of this, it would be strange if the progress which has been made in the knowledge of the animal economy, as well as in other sciences, did not enable us to correct many "indigenous customs," which, in reality, have ignorance, superstition, or even vice for their foundation. This applies particularly to the eastern world, where the natives are neither in a state of nature, nor yet refinement; but where we see a strange medley of ludicrous and ridiculous customs—of Hindoo and Mahommedan manners, from which the European philosopher may glean much useful local knowledge, while he exercises his reason and discrimination, in separating the grain from the chaff.

Another advice has been given us; namely, to observe and imitate the conduct of our own countrymen long resident in the climate. This is certainly the most practicable; but, in my opinion, it is not the safest plan. And for this plain reason, that *residence* alone confers on them immunities and privileges, of which it would be death for us, in many instances, to claim a participation, before the period of our probation has expired. I think I shall be able to shew, hereafter, that the unseasoned European may apply, with safety, certain preventive checks to the influence of climate, which would be inconvenient, if not hazardous, to those on whom the said influence had long operated. The stranger, then, must go with the general stream of society, especially at the beginning; but there is no situation even here, where he may not obviate, in a great measure, the first and most dangerous effects of the

new climate, by a strict observance of two fundamental rules —TEMPERANCE and COOLNESS. The latter, indeed, includes the former; and, simple as it may appear, it is, in reality, the grand principle of Inter-tropical Hygiene, which must ever be kept in view, and regulate all our measures for the preservation of health.

Common sense, independently of all observation or reasoning on the subject, might, *a priori*, come to this conclusion. From *heat* spring all those effects which originally *predispose* to the reception or operation of other morbific causes. And how can we obviate these effects of *heat*, but by calling in the aid of its antagonist, *cold?** To the *sudden* application of the *latter*, after the *former* has effected its baneful influence on the human frame, I have traced most of those diseases attributable to climate; nothing, therefore, can be more reasonable, than that our great object is to moderate, by all possible means, the *heat*, and habituate ourselves from the beginning to the impressions of cold. The result will be, that we shall thereby bid defiance to the alternations or *vicissitudes* of both these powerful agents. This is, in truth, the grand secret of counteracting the influence of tropical climates on European constitutions; and its practical application to the common purposes of life, as well as to particular exigencies, it shall now be my task to render easy and intelligible. For the sake of perspicuity, I shall here, as hitherto, class my observations under separate heads; though, from the nature of the subject, I shall consider myself much less shackled, or tied down to forms, than in the two preceding parts of the essay; and consequently, shall not be over nice in confining myself to a dry, didactic rehearsal of medical rules and precautions. The scope and purport of any digression, however, shall always point to my principal design—the preservation of health.

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* I overlook the useless litigation respecting cold being the absence of heat.

DRESS.

Sec. 1.—I shall not stop here, to inquire whether this be an unnecessary luxury of our own invention, or originally designed for us by our Creator. The force of habit is, no doubt, great; and the Canadian who, in reply to the European's inquiry, respecting his ability to bear cold applied to his naked body, observed, that "he was *all face*," gave no bad elucidation of the affair. Passing over the great African peninsula, where man enjoys that happy state of nudity and nature, mental as well as corporeal, on which our learned philosophers have lavished such *merited* encomiums, we come to the ancient and civilized race of Hindoos; and here, too, we shall be constrained to admire the almost omnipotent power of custom, as exemplified in the persons of some of the first objects that arrest our attention.

The habiliment of the Bengal *dandy*, or waterman, who rows or drags our *budjrow* up the Ganges, consists in a small, narrow piece of cloth [doty] passed between the thighs, and fastened before and behind to a piece of stout packthread, that encircles the waist. In this dress, or undress, corresponding pretty nearly to the *figleaf* of our great progenitor, he exposes his skin to the action of a tropical sun—a deluge of rain, or a piercing *north-wester*, with equal indifference! After "tugging at the oar," for hours together, in the scorching noontide heat, till perspiration issues from every pore, he darts overboard, when necessary, with the track-rope on his shoulder, and wades through puddles and marshes—this moment up to the middle, or the shoulders in water—the next, in the open air, with a rapid evaporation from the whole surface of his body! All this, too, on a scanty meal of rice, being seldom paid more than—*three-pence per day board wages!*

Here is one of those indigenous customs, which we shall not find it very safe to imitate; though many of our keen European sportsmen have undergone for pleasure, or in search of a snipe, what the poor *dandy* is forced to perform for a livelihood. It is hardly necessary to remark, that such pursuits are at the risk of life, and are highly destructive of health.

But, independent of habit, Nature has previously done a great deal towards the security of the *dandy*, by forming the *colour*, and in some respects the *texture*, of his skin, in such a manner, that the extreme vessels on the surface are neither so violently stimulated by the heat, nor so easily struck torpid by sudden transitions to cold. Certain it is, that the action of the perspiratory vessels, too, is different from that of the same vessels in Europeans—at least, they secrete a very different kind of fluid; being more of an oily and tenacious nature than the sweat of the latter. This, in conjunction with the oil so assiduously and regularly rubbed over the surface, every day, by all ranks and casts of both sexes, must greatly tend to preserve a softness and pliability of the skin, and a moderate, equable flow of perspiration.*

But if we look beyond the hardy and labouring casts of natives, we observe both Hindoo and Mahomedan guarding most cautiously against solar heat, as well as cold. The *turban* and *cummerbund* meet our eye at every step:—the former, to defend the head from the direct rays of a powerful sun; the latter, apparently, for the purpose of preserving the important viscera of the abdomen from the deleterious impressions of cold. This [cummerbund] is certainly a most valuable part of their dress; and one that is highly deserving of imitation.

Such are the *essential* articles of Native dress; the light, flowing robes of cotton, silk, calico, &c. varying according to the taste or circumstances of the wearer, and being more for ornament than use. A very good substitute for the *turban* is a large cotton handkerchief, folded up in the hat; and, where we are exposed to the direct influence of solar heat, it may, with much advantage, be kept moistened with water. In situations where atmospherical vicissitudes are sudden, a fine shawl round the waist forms an excellent *cummerbund*, and should never be neglected, especially by those who have been some time in the conntry, or whose bowels are in any degree tender.

When we enter the tropics, we must bid adieu to the luxury of linen——if what is both uncomfortable and unsafe, in those climates, can be styled a luxury. There

* It is curious, that the upper classes of native ladies, especially Mahomedan, as if determined that nothing of European complexion should appertain to them, are in the habit of staining red, with the *mindy* or hinna plant, the palms of their hands and soles of their feet, the only parts of the external surface where the *rete mucosum*, or seat of colour among them, cannot maintain its deep tint, on account of the friction.

are many substantial reasons for so doing. Cotton, from its slowness as a conductor of heat, is admirably adapted for the tropics. It must be recollected, that the temperature of the atmosphere, *sub dio*, in the hot seasons, exceeds that of the blood by many degrees; and even in the shade, it too often equals, or rises above, the heat of the body's *surface*, which is always, during health, some degrees below 97°. Here, then, we have a covering which is *cooler* than linen; inasmuch as it conducts more slowly the *excess* of external heat *to* our bodies. But this is not the only advantage, though a great one. When a *vicissitude* takes place, and the atmospherical temperature sinks suddenly far below that of the body, the cotton, still faithful to its trust, abstracts more slowly the heat *from* our bodies, and thus preserves a more steady equilibrium there. To all these must be added the facility with which it absorbs the perspiration; while linen would feel quite wet, and during the exposure to a breeze under such circumstances, would often occasion a shiver, and be followed by dangerous consequences.

That woollen and cotton should be *warmer* than linen in low temperatures, will be readily granted; but that it should be *cooler* in high temperatures, will probably be much doubted. If the following easy experiment be tried, the result will decide the point in question. Let two beds be placed in the same room, at Madras, we will say, when the thermometer stands at 90°; and let one be covered with a pair of blankets, the other with a pair of linen sheets, during the day. On removing both coverings in the evening, the bed on which was placed the blankets, will be found *cool* and pleasant; the other uncomfortably warm. The reason is obvious. The linen readily transmitted the heat of the atmosphere to all parts of the subjacent bed; the woollen, on the contrary, as a non-conductor, prevented the bed from acquiring the atmospherical range of temperature, simply by obstructing the transmission of heat from without. This experiment not only proves the position, but furnishes us with a grateful and salutary luxury, free of trouble or expence.—The musical ladies of India are not unacquainted with this secret, since they take care to keep their pianos well covered with *blankets* in the *hot season*, to defend them from the heat, and prevent their warping.

From this view of the subject, *flannel* might be supposed superior to *cotton*; and indeed, at certain seasons, in particular places—for instance, Ceylon, Bombay, and Canton, where the mercury often takes a wide range, in a very short

space of time, the *former* is a safer covering than the latter, and is adopted by many experienced and seasoned Europeans. But, in general, flannel is inconvenient, for three reasons. First, it is too heavy; an insuperable objection. Secondly, where the temperature of the atmosphere ranges pretty steadily a little below that of the skin, the flannel is much too slow a conductor of heat *from* the body. Thirdly, the spicula of flannel prove too irritating, and *increase* the action of the perspiratory vessels on the surface, where our great object is to *moderate* that process. From the second and third objections, indeed, even cotton or calico is not quite free, unless of a fine fabric, when its good qualities far counterbalance any inconvenience in the above respects.

In some of the upper provinces of Bengal, where the summer is intensely hot, and the winter sharp, the dress of native shepherds, who are exposed to all weathers, consists in a blanket gathered in at one end, which goes over the head, the rest hanging down on all sides like a cloak. This answers the triple purpose of a *chattah* in the summer, to *keep out* the heat—of a tent in the rainy season, to throw off the wet—and of a coat in the winter, to defend the body from the piercing cold. Hence our ridicule of the Portuguese and Spaniards, in various parts of the world, for wearing their long black cloaks in summer, "*to keep them cool*," is founded on prejudice rather than considerate observation.

The necessity which tyrant custom—perhaps policy, has imposed on us, of continuing to appear in European dress—particularly in *uniforms*, on almost all public occasions, and in all formal parties, under a burning sky, is not one of the least miseries of a tropical life! It is true, that this ceremony is often waved, in the more social circles that gather round the supper-table, where the light, cool, and elegant vesture of the East, supersedes the cumbrous garb of Northern climates. It is certainly laughable, or rather pitiable enough, to behold, for some time after each fresh importation from Europe, a number of *griffinish* sticklers for decorum, whom no persuasions can induce to cast their *exuviæ*, even in the most affable company, pinioned, as it were, in their stiff habiliments, while the streams of perspiration that issue from every pore, and ooze through various angles of their dress, might almost induce us to fear that they were on the point of realizing Hamlet's wish; and that, in good earnest, their

"Solid flesh would melt—
"Thaw, and resolve itself into a dew!"

It too often happens, however, that a spice of ceremony attaches to the kind host—or perhaps hostess, in which case, as no encouragement will be given to derobe, the poor griffin must fret and fume, with prickly heat and perspiration, till the *regalement* is concluded. By this time he is, doubtless, in an excellent condition for encountering the raw, chilling vapours of the night, on his way home!

It were "a consummation devoutly to be wished,"—though, I fear, little to be expected, that the European badges of distinction, in exterior decoration, could be dispensed with, at all festivals, public and private—formal, social, or domestic, within the torrid zone. It requires but the most superficial glance to perceive, that coolness during our repasts is salutary, as well as comfortable; and that, from the extensive sympathies existing between the skin and several important organs, particularly the stomach and liver, that the converse of the position is equally true; especially as, in the *latter* case, we are led a little too much to the use of "gently stimulating liquids, to support the discharge;" the bad consequences of which are pointed out at page 9 of this essay, and will be again considered in the section on Drink.

There is an injurious practice, into which almost every European is led, on first visiting a tropical climate, but particularly the Eastern world, which has never been noticed, I believe by medical writers, though well entitled to consideration. In the country last mentioned, body linen, or rather cotton, is remarkably cheap, and washing is performed on such moderate terms, that one hundred shirts may be even *bleached* for about 10s. sterling, on an average. A large stock of these useful articles is, then, the first object of northern strangers, which "*Blacky*," indeed, knows full well, and takes especial care to turn to his own advantage. But this is a trifling consideration.—The European, contemplating, with great satisfaction, the multitude of changes he has thus cheaply amassed, and calculating the very reasonable terms of ablution, determines to enjoy, in its fullest extent, a luxury which he deems both salutary and grateful, independently of all considerations respecting appearance. It is therefore very common to see him shift his linen three or four times a-day, during the period of his novitiate, when perspiration is indeed superabundant.—But, let me assure him, that he is pursuing an injudicious, —nay, an injurious system; that the fluid alluded to, already in excess, is thus powerfully solicited; and the action of the perspiratory vessels, with all their associations, morbidly increased, instead of being restrained. But what is to be

done? The newly-arrived European justly observes, that he finds himself drenched with sweat, three or four times a-day, in which state he cannot remain with either safety or comfort. Certainly it would be useless to point out the evil, without suggesting the remedy; and happily it may be obviated, to a considerable extent, in a very simple and easy manner. In those climates, when linen becomes wet in a few hours with perspiration, it by no means follows that it is soiled thereby, in any material degree. It should not, therefore, be consigned to the wash, but carefully dried, and *worn again*, once, or even twice; and that, too, without the smallest infringement on the laws of personal cleanliness, but with the most salutary effect on the health. It is astonishing how much less exhausting is the linen, which has been once or twice impregnated with the fluid of perspiration, than that which is fresh from the mangle. By this plan, no more than one shirt is rendered unfit for use every day; and in cool weather, or at sea, not more, perhaps, than four shirts a week. Necessity, the mother of invention, first taught me this piece of knowledge, in consequence of having lost my stock once, by sailing suddenly from Trincomalee; but I know that, however trivial the circumstance may *appear*, an attention to what I have related will, in reality, prove more beneficial than precautions of seemingly greater magnitude. Its rationale is in direct unison with the grand and fundamental object in tropical prophylactics—TO MODERATE, WITHOUT CHECKING THE CUTICULAR DISCHARGE.

The property which *frequent* change of linen has, in exciting cuticular secretion, and the effects resulting from the sympathy of the skin with the stomach, liver, and lungs, may account, in a great measure, for the superior health which accompanies cleanliness, in our own climate; and, on the contrary, for the diseases of the indigent and slovenly, which are almost invariably connected with, or dependent on, irregularity or suppression of the cuticular discharge. Intelligent females well know the *peculiar effect* of clean linen on themselves, at particular periods.

To the above observations on dress, I may add, that no European should, where he can avoid it, expose himself to the sun between the hours of ten and four in the day. If forced, during that period, to be out of doors, the *chattah* should never be neglected, if he wish to guard against *coup de soleil*, or some other dangerous consequence of imprudent exposure.

FOOD.

Ut semel dicam, una gula est omnium morborum
Mater, etiamsi alius est genitor.—*Fernelius.*

Sec. II.—Although I entirely agree with Celsus, that—"*sanis omnia sana;*" and with a late eminent physician, that an attention to *quantity* is of infinitely more consequence than *quality* in our repasts; and although I also believe, that an over-fastidious regard to *either* will render us unfit for society, and not more healthy after all; yet, when we change our native and temperate skies of Europe for the torrid zone, many of us may find, when it is too late, that we can hardly attend too strictly to the quantity and quality of our food, during the period of assimilation, at least, to the new climate; and that a due regulation of this important non-natural will turn out a powerful engine in the preservation of health.

It is now pretty generally known, from dire experience, indeed, that instead of a disposition to *debility and putrescency*, an inflammatory diathesis, or tendency to plethora, characterises the European and his diseases, for a year or two, at least, after his arrival between the tropics; and hence provident Nature endeavours to guard against the evil, by diminishing our relish for food. But alas! how prone are we

"——————— to spur beyond
Its wiser will, the jaded appetite,"

not only "by dishes tortured from their native taste," but by the more dangerous stimulants of wine or other liquors, as well as condiments and spices, which should be reserved for that general relaxation and debility which unavoidably supervene during a *protracted residence* in sultry climates. Here is an instance where we cannot *safely* imitate the seasoned European. Indeed, there are no points of Hygiene, to which the attention of a new-comer should be more particularly directed, than to the *quantity and simplicity* of his viands; especially as they are practical points entirely within his own superintendance, and a due regulation of which, is not at all calculated to draw on him the observation of others—a very great advantage.

Every valetudinarian, particularly the hectic, knows full well the *febrile paroxysm* which follows a full meal: the same takes place in every individual, more or less, whatever may be the state of health at the time. How cautious, then, should we be, of exacerbating these natural paroxysms, when placed in situations where various *other* febrific causes are constantly impending over, or even assailing us! The febrile stricture which obtains on the surface of our bodies, and in the secerning vessels of the liver, during the *gastric digestion* of our food, as evinced by a diminution of the cutaneous and hepatic secretions, (vide page 166.) will, of course, be proportioned to the duration and difficulty of that process in the stomach, and to the quantity of ingesta; and as a corresponding *increase* of the two secretions succeeds, when the chyme passes into the intestines, we see clearly the propriety of moderating them by abstemiousness, since they are already in *excess*, from the heat of the climate alone; and this *excess* is one of the first links, in the chain of causes and effects, that leads ultimately to various derangements of function and structure in important organs, as exemplified in hepatitis, dysentery, and in many parts of this essay.

That vegetable food, generally speaking, is better adapted to a tropical climate than animal, I think we may admit; and particularly among unseasoned Europeans:—not that it is quicker or easier of digestion, (it certainly is slower in this respect) but it excites less commotion in the system during that process, and is not so apt to induce plethora afterwards. It is very questionable whether the ancient Hindoo legislators had not an eye rather to policy than health, when they introduced the prohibition of animal food as a divine mandate. They probably thought, and in my opinion with good reason, that the injunction would tend to diffuse a more humane disposition among the people, by strongly reprobating the effusion of blood, or depriving any being of existence; and these prejudices were admirably sustained by the doctrine of transmigration.—

> Hence drew th' enlightened sage the moral plan,
> That man should ever be the friend of man—
> Should view with tenderness all living forms,
> His brother-emmets, and his sister-worms!

But, whatever might have been the medical objections of BRAHMA to carnivorous banquets, certain it is, that a race of what now may come under the denomination of "*natives*,"

(the Mahomedans) amounting to, perhaps, a seventh or eighth of the whole population, make no scruple of indulging freely in most kinds of animal food:—who, in the face of the shuddering Hindoo, will sacrilegiously slay and eat that great Indian deity, the *cow*; and who, in their turn, look with perfect abhorrence on the polluted Englishman, who regales himself—not, indeed, on four-footed deity, but, in the Mussulman's opinion, with worse than cannibalism, or devil incarnate—PORK!

> ——————Mox et *preputia* ponunt,
> Nec distare putant *humana carne suillam*,
> Quâ pater abstinuit.——————JUV.

Yet Hindoo, Mahomedan, and European—at least, the two first, while *moderation* is observed in their respective meals, enjoy equal health, and attain equal longevity.

> So Heaven has formed us to the general taste
> Of all its gifts, so custom has improved
> This bent of nature, that few simple foods,
> Of all that earth, or air, or ocean yield,
> But by *excess* offend.——————

Yet, if we critically examine the different casts, or rather classes of society, in India, we shall find that their physical powers and appearances are considerably modified by their manner of living. Nothing strikes the stranger with greater astonishment, than the personal contrast between the rich and the poor! Almost the whole of the upper classes are absolutely FALSTAFFS; and often have I been puzzled to know how some of them could stow themselves away in a palankeen, and still more so, how their bearers could trot along under the pressure of such human porpoises! The truth is, that the Hindostannee fops, (and most of the superior orders are such) pride themselves, above all things, on rotundity of corporation, and particularly on the *magnitude of their heads.*

To acquire such elegant distinctions, one would be tempted to suspect, that they occasionally broke the vegetable *regime*, and indulged in better fare than BRAHMA thought proper to prescribe. But no; all is accomplished by *ghee* and indolence! Of the former, which is a kind of semi-liquid butter, made by evaporating the aqueous part from the rich milk of the buffalo, they swill immense quantities; and whatever we may hear, from *fireside* travellers, of Hindoo

temperance and abstemiousness, these gentry contrive to become as *bilious*, occasionally, as their European neighbours, and manage to curtail the natural period of their existence full as efficaciously, as their brother "*gourmands*" on this side of the water—making their exits, too, by the same short routes of apoplexy, and other fashionable near-cuts to heaven.

The lower or industrious classes, on the other hand, who live almost exclusively on vegetables, certainly bear a striking resemblance to "Pharaoh's lean-fleshed kine." But altho' they have not the physical strength of an European, they make up for this, in what may be termed "*bottom*;" for it is well known, that a native will go through three times as much fatigue, under a burning sky, as would kill an Englishman outright—witness the palankeen bearers, coolies, dandies, hircarrahs, &c. Nor is temperance always a prominent feature in the character of these gentry; for, what with bang, toddy, arrack, opium, and other inebriating materials, which all countries produce in some shape or other, and which all nations have shewn their ingenuity in manufacturing, they not seldom "muddle their brains," with as much glee as the same description of people in our own latitudes. Those, on the other hand, who, from local situation, poverty, or principle, adhere to the dictates of their religion and cast with great pertinacity, and seldom admit animal food within the circle of their repast (milk excepted), are certainly exempted from numerous ills that await our and their countrymen, who transgress the rules of temperance. Yet, when they are overtaken by disease, they have not *stamina*, and debility characterises the symptoms. Upon the whole, I am inclined to think that, taking the average longevity of all ranks and classes throughout the vast oriental peninsula, the period of human life falls a full *eighth* short of its European range.—But as this does not quadrate with the opinions of speculative philosophers at home, who *will* equalize the age of man all over the world, I shall cite the authority of a very intelligent Officer, whom I have so often quoted before, and who had some twenty years' acquaintance with the country in question. "Longevity," says he, "certainly is not characteristic of India. Whether this is owing to the excessive heat, or the indolence of the upper and drudgery of the lower classes, it may be difficult to decide; but certain it is, that we rarely see an instance of *any one* arriving at sixty years of age."*

* Oriental Field Sports, vol. 1, p. 236.

From indigenous customs, then, in respect to animal and vegetable food, we can draw no inference that absolutely prohibits the *former*, but enough to convince us, that during the first years of our sojourn between the tropics, we should lean towards the Hindoo model; and as the tone of the constitution becomes lowered, or assimilated, we may safely adopt the Mahomedan manners.

The period of our meals, in hot climates, indeed in all climates, is worthy of notice. Both Hindoo and Mahomedan breakfast early—generally about sunrise. Their early hours cannot be too closely imitated by Europeans. This is a very substantial meal, particularly with the Hindoo; for rarely does he take any thing else till the evening: a custom, in my opinion, that would be very prejudicial to Europeans.—Breakfasts, among the latter, are often productive of more injury than dinners, especially where fish, eggs, ham, &c. are devoured without mercy, as not unfrequently happens.—Many a nauseous dose of medicine have I been obliged to swallow, from indulging too freely in these articles; but I saw my error before it was too late. Most people suppose, that as a good appetite in the morning is a sign of health, so they cannot do sufficient honour to the breakfast table; but the stomach, though it may relish, is seldom equal to the digestion of such alimentary substances as those alluded to, where a sound night's rest has hardly ever been procured. I have seen the most unequivocal bad effects from heavy breakfasts, in others, as well as in my own person; and I shall relate one instance, that may well serve as a drawback on the pleasures of a luxurious *déjeunee* in the East. Mr. B———, Purser of a frigate, a gentleman well known on the station, was as determined a *bon-vivant* as ever I had the honour of being acquainted with.—"*De mortuis nil nisi verum.*"—He certainly had possessed a most excellent constitution; for I have seen it perform prodigies, and falsify the most confident medical prognostications! He had served many years in the West Indies, where he passed through the usual ordeals of yellow fever, dysentery, &c. with *eclat;* and he came to the East, with the most sovereign contempt for every maxim of the hygeian goddess! Although he never neglected, even by accident, his daily and nightly libations to the rosy god, yet no sportsman on the Caledonian mountains, could do more justice to a Highland breakfast than he. Indeed, he rarely went to sea, without an ample private stock of epicurean provender; and I have seen him thrown into a violent paroxysm of rage,

on finding that two nice-looking hams, which he had purchased in China, resisted all attacks of the knife, in consequence of a certain *ligneous* principle, which "FUKKI" had contrived to substitute, with admirable dexterity, for the more savoury fibres of the porker! The items of the *last* breakfast which he made, minuted on the spot by a *German* surgeon, who attended him, are now before me. The prominent articles were, four hard-boiled eggs, two dried fishes, two plates of rice, with chillies, condiments, and a proportionate allowance of bread, butter, coffee, &c. Many a time had I seen him indulge in this kind of fare with perfect impunity; but all things have an end, and this proved his final breakfast! He was almost immediately taken ill, and continued several days in the greatest agony imaginable!

——————— Sed illum
Dolorem peperet cibus imperfectus et hærens
Ardenti stomacho!

Notwithstanding all the efforts of the surgeon, no passage downwards could ever be procured till a few hours before his death, when mortification relaxed all strictures!! Let the fate of the dead prove a warning to the living!

The newly arrived European should content himself with plain breakfasts of bread and butter, with tea or coffee; and avoid indulging in meat, fish, eggs, or buttered toast. The latter often occasions rancidity, with nausea at the stomach, and increases the secretion of bile, already in excess. Indeed, a glance at master *Babachee*, buttering our toast with the greasy wing of a fowl, or an old, dirty piece of rag, will have more effect in restraining the consumption of this article, than any didactic precept which I can lay down; and a *picturesque* sight of this kind may be procured any morning, by taking a stroll in the purlieus of the kitchen.

In regard to dinner, Europeans appear of late to study convenience rather than health, by defering that meal till sunset. This was not the case some twenty or thirty years ago; and many families, even now, dine at a much earlier hour, except when tyrant custom and ceremony prevent them. In truth, the modern dinner in India is perfectly superfluous, and too generally hurtful. The *tiffin*, at one o'clock, consisting of light curries, or the like, with a glass or two of wine, and some fruit, is a natural, a necessary, and a salutary repast.—But the gorgeous table—the savoury viands—the stimulating wines of the evening feast, prolonged by the fascination of

social converse, greatly exacerbate the nocturnal paroxysm of fever imposed on us by the hand of nature, and break with feverish dreams, the hours which should be dedicated to repose! The consequences resulting from this are quite obvious. It may be observed, that the natives themselves make their principal meal at sunset, when the heat is less distressing, and insects neither so numerous nor teasing; but it must be recollected, that they, in general, eat nothing between breakfast and dinner; and that among the Hindoos and lower classes of Mahomedans, &c. the evening meal is by no means of a stimulating quality, while no provocative variety, or other adventitious circumstances, can have much effect in goading the appetite beyond its natural level. Add to this, that in the upper provinces, among Mahomedans of distinction, who can afford more substantial, and animal food, the dinner hour is *one or two o'clock*, and after that, little or nothing, except coffee, sweetmeats or fruit, is taken during the evening.

He, then, who consults his health in the Eastern world, or in any tropical climate, will beware of indulging in this *second* and *unnecessary* dinner, particularly during the period of his probation; but will rather be satisfied with the meridian repast, as the *principal* meal, when tea or coffee, at six or seven o'clock in the evening, will be found a grateful refreshment. After this, his rest will be as natural and refreshing, as can be expected in such a climate; and he will rise next morning with infinitely more vigour, than if he had crowned a sumptuous dinner with a bottle of wine the preceding evening. Let but a trial of one week put these directions to the test, and they will be found to have a more substantial foundation than *theory*.

Of supper it is not necessary to speak, as it is a mere matter of ceremony in hot climates, excepting after assemblies, or on some public occasions, which indeed are badly suited to the torrid zone.

A limited indulgence in fruits, during the first year, is prudent. Although I myself never had any reason to believe that they actually occasioned dysentery, yet, where the intestines are *already* in an irritable state, from irregular or vitiated secretions of bile, they certainly tend to increase that irritability, and consequently *predispose* to the complaint in question. Particular kinds of fruit, too, have peculiar effects on certain constitutions. Thus, *mangoes* have something stimulating and heating in them, of a terebinthinate nature,

which not seldom brings out a plentiful crop of pustules, or even boils, on the unseasoned European. A patient of mine, who died from the irritation of an eruption of this kind, had been much addicted to an unrestrained indulgence in fruit, particularly mangoes ;—indeed their effect in this way is familiarly known in India. Neither is pine-apple (though very delicious) the safest fruit to make too free with, at first. Good ripe shaddocks are very grateful in hot weather, from their subacid and cooling juice, so well adapted to allay the unpleasant sensation of thirst. Plantains and bananas are wholesome and nutritious, especially when frittered. The spices and condiments of the country, as I before hinted, should be reserved for those ulterior periods of our residence in hot climates, when the tone of the constitution is lowered, and the stomach participates in the general relaxation. They are then safe and salutary.

DRINK.

Sævientia guttura satiare non possunt fluvia et Maria.
ÆNEAS SYLVIUS.

SEC. III.—I shall not here attempt to prove, that WATER is the simple and salutary beverage designed by Nature for man, as well as other animals. In every nation, even the most refined and modern, a great majority appear, by their practice at least, to entertain no such belief. They have, with no small ingenuity, contrived so to medicate the native fountain, that they are always either outstripping, or lagging behind, the placid stream of life! The same magic bowl which, this moment,

"Can pour remotest rapture on the sight,"

and raise its votaries into heroes and demi-gods, will, in a few hours, sink them beneath the level of the brute creation!!

Instant her circling wand the goddess waves,
To hogs transforms them, and the sty receives!
No more is seen the human face divine,
Head, face, and members, bristle into swine!

The moralist and philosopher have long descanted on this theme, with little success; for, until people begin to feel the corporeal effects of intemperance, a deaf ear is turned to the most impressive harangues against that deplorable propensity; and even then, but very few have resolution and fortitude to stem the evil habit! Let us do our duty, however, in conscientiously pourtraying the effects of drink in a tropical climate.

I have already observed, that the grand secret, or fundamental rule, for preserving health in hot countries, is, "TO KEEP THE BODY COOL." I have also alluded to the strong sympathy that subsists between the skin and several internal organs, as the stomach, liver, and intestinal canal. On this principle, common sense alone would point out the propriety of avoiding heating and stimulating drink, for the same reasons that we endeavour to guard against the high temperature of the climate. But no; a wretched, sensual theory has

spread from the vulgar to many in the profession (who ought to know better) that since the heat of the climate occasions a profuse perspiration, and consequently renders that discharge the more liable to a sudden check, we are to aid and assist these natural causes by the use of "*gently stimulating liquids*," and, of course, increase those very effects which we pretend to obviate! "A little shrub and water," says Mr. Curtis, (Diseases of India) "or madeira and water, *between meals*, is useful, and in some measure *necessary*, to keep up the tone of the digestive organs, and to supply [i. e. augment] the waste occasioned by an excessive perspiration." p. 281. I can assure Mr. Curtis that, however *necessary*, this practice might have been thought in his time, (thirty years ago) it is *now* considered not only *unnecessary*, but disgraceful; and that in no respectable circle in the Eastern world, beyond the confines of the "*Punch-house*," where no European of character will ever be seen, [especially in Bengal] is any sangaree, porter-cup, or other "gently stimulating liquid," made use of "between meals." And I take this opportunity of informing and warning every *new-comer*, that the very call of "*brandy-shrub-pauny!*" will endanger his being marked as a "*vitandus est*," and that a perseverance in such habit will inevitably, and very quickly too, exclude him from every estimable circle of his own countrymen, who will not fail to note him as in the high road to ruin!

Nor did these most excellent habits of temperance originate in any medical precepts or admonitions—far from it! The professional adviser was by no means solicitous to inculcate a *doctrine*, which it might not suit his taste to *practise*. But in a vast empire, held by the frail tenure of opinion, and especially where the current of religious prejudices, Brahmin as well as Moslem, ran strong against intoxication, it was soon found necessary, from imperious motives of policy, rather than of health, to discourage every *tendency* towards the acquisition of such dangerous habits. Hence the inebriate was justly considered as not merely culpable in destroying his own health, *individually*, but as deteriorating the European character in the eyes of those Natives, whom it was desirable at all times to impress with a deep sense of our superiority. Happily, what was promotive of our *interest*, was preservative of our health, as well as conducive to our happiness; and the general temperance in this respect, which now characterises the Anglo-Asiatic circles of society, as contrasted with Anglo-West-Indian manners, must utterly

confound those fine-spun theories, which the votaries of porter-cup, sangaree, and other "gently stimulating liquids," have invented about—"supporting perspiration," "keeping up the tone of the digestive organs," &c. all which, *experience* has proved to be not only *ideal*, but *pernicious!* "On the meeting together of a company of this class," [planters] says a modern writer on the West Indies, "they were accustomed *invariably*, to sit and continue swilling strong punch, (sometimes half rum) and smoking segars, till they could neither see nor stand; and he who could swallow the greatest quantity of this *liquid fire*, or infuse in it the greatest quantity of ardent spirits, was considered the cleverest fellow." *Account of Jamaica and its Inhabitants*, 1808.—p. 189. And again: "The inferior orders, in the towns, are by no means exempt from the reproach of intemperance; nor are the more *opulent classes*, generally speaking, *behind hand* in this respect. Sangaree, arrac-punch, and other potations, are pretty *freely drank, early in the day*, in the taverns."—p. 199.

I can conceive only one plausible argument which the transatlantic Brunonian can adduce, in support of his doctrine after the unwelcome *denouement* which I have brought forward respecting oriental customs; namely, that as the range of atmospherical heat, in the West Indies, is several degrees *below* that of the East, it may be necessary to counterbalance this deficit of *external* heat, by the more assiduous application of *internal* stimulus!! For this hint he will, no doubt, be much obliged to me, as he must consider the argument irresistible.

I may here remark, that too much praise cannot be given to the captains of East Indiamen, for the lessons of temperance and decorum that are generally taught on board their ships (whatever may be the motives) during the outward bound passage. The very best effects result from this early initiatory discipline, in a thousand different ways. Rarely, indeed, in the vessels alluded to, does the decanter make more than half a dozen tours (often not so many) after the cloth is removed at dinner, before the company disperse, by a delicate, but well known signal, either to take the air upon deck, or amuse themselves with books—chess—music, or the like, till the evening. After a very frugal supper, the bottle makes a tour or two, when the significant toast of—"*Good night, ladies and gentlemen!*" sends every one, at an early hour, to repose.

It may readily be conceived, of what incalculable utility five or six months' *regimen* of this kind must prove to Europeans, approaching a tropical climate; especially when policy and imperious custom will enforce its continuance there! It is true, that at each of the presidencies, there may be found several individuals of the old bacchanalian school, whose wit, humour, or vocal powers, are sometimes courted, on particular occasions, to—"set the table in a roar." But let not such expect to mingle in the *domestic* circles of respectable society (where alone true enjoyment is to be found) either in the civil or military departments. No such thing as a regimental mess exists in India; and as convivial association thus becomes perfectly optional, the least tendency to inebriety will assuredly *insulate* the individual who, from solitary indulgence and reflection, soon falls a martyr to the baneful effects of INTEMPERANCE!

> Add, that your means, your health, your parts decay:
> Your friends avoid you; brutishly transform'd,
> They hardly know you; or, if one remains
> To wish you well—he wishes you in heaven!!

The navy presents a different aspect. Few of these have an opportunity of becoming acquainted with the domestic manners either of the natives or Europeans on shore; and therefore, they pursue their usual course of living, both in food and drink, for a considerable time after arriving on the station; verifying the observation, that—

> "Cœlum non animum mutant qui transmare currunt."

And although they are fortunately less exposed, in general, to many of those causes which aggravate the effects of inebriety ashore, yet much injury is produced before they see their error.

A very common opinion prevails, even in the profession, —and I am not prepared to deny its validity, that during the operation of wine or spirits on the human frame, we are better able to resist the agency of certain morbid causes, as contagion, marsh effluvium, cold, &c. But, let it be remembered, that it is only while *the excitement* lasts, that we can hope for any superior degree of immunity from the said noxious agents; after which, we become doubly disposed towards their reception and operation! Nor am I fully convinced, by all the

stories I have heard or read, that *inebriety* has, in any case or emergency, even a *momentary* superiority over *habitual* temperance.

The delusion in respect to vinous and spirituous potations, in hot climates, is kept up chiefly by this circumstance, that their bad effects are, in reality, not so conspicuous as one would expect; and they rather predispose to, and aggravate the various causes of disease resulting from climate, than produce direct indisposition themselves; consequently, superficial observation places their effects to the account of other agents. But the truth is, that, as *drunkenness*, in a moral point of view, leads to every vice; so, in a medical point of view, it accelerates the attack, and renders more difficult the cure of every disease, more particularly the diseases of hot climates; because it has a *specific* effect, I may say, on those organs, to which the deleterious influence of climate is peculiarly directed. If the northern inebriate is proverbially subject to hepatic derangement, where the coldness of the atmosphere powerfully counterpoises, by its action on the surface, the internal injury induced by strong drink, how can the Anglo-East or West-Indian expect to escape, when the external and internal causes run in perfect unison, and promote each other's effects by a wonderful sympathy?

It has been considered wise, as I before hinted, to take the seasoned European for our model, in every thing that respects our *regime* of the non-naturals. "Strangers," says Mr. Curtis, "arriving in India, if they regard the preservation of health, cannot too soon adopt the modes of living followed by the experienced European residents there." I do not conceive this to be a good medical maxim, even in India, where temperance is scarcely a virtue; and certain I am, that it is a most dangerous precept in the West, for reasons which I have lately rendered sufficiently obvious. It confounds all discrimination between the very different habits of body, which the seasoned and unseasoned possess. It is consonant with experience, as well as theory, that the *former* class may indulge in the luxuries of the table, with infinitely less risk than the *latter;* and this should ever be held in view. In short, the nearer we approach to a perfectly *aqueous* regimen in drink, during the first year at least, so much the better chance have we of avoiding sickness; and the more slowly and gradually we deviate from this afterwards, so much the more retentive will we be of that invaluable blessing—HEALTH!

It might appear very reasonable, that in a climate where *ennui* reigns triumphant, and an unaccountable languor pervades both mind and body, we should cheer our drooping spirits with the mirth-inspiring bowl.—

> " Boy, let yon *liquid ruby* flow,
> And bid thy *pensive heart* be glad,
> Whate'er the frowning zealots say:—
> Tell them, their Eden cannot shew
> A stream so clear as Rocnabad."

But Hafiz, though an excellent poet, and, like his predecessor, Homer, a votary of Bacchus, was not much of a physician; and without doubt, this "*liquid ruby*," as he calls it, is one of the worst of all prescriptions for a "pensive heart." I remember a gentleman at Prince of Wales's Island, [Mr. S.] some years ago, who was remarkable for his convivial talents and flow of spirits. The first time I happened to be in a large company with him, I attributed his animation and hilarity to the wine, and expected to see them flag, as is usual, when the first effects of the bottle were past off; but I was surprised to find them maintain a uniform level, after many younger heroes had bowed to the rosy god. I now contrived to get near him, and enter into conversation, when he disclosed the secret, by assuring me he had drunk nothing but water for many years in India; that in consequence, his health was excellent—his spirits free—his mental faculties unclouded, although far advanced on time's list: in short, that he could conscientiously recommend the "*antediluvian*" beverage, as he termed it, to every one that sojourned in a tropical climate.

But I am not so *utopian*, as to expect that this salutary example will be generally followed; though it may lead a few to imitate it, till the constitution is naturalized, when the *pleasures of temperance* may probably induce them to persevere. At all events, the new-comer should never exceed three or four glasses of wine after dinner, or, on any account admit it to his lips between meals, unless excessive fatigue and thirst rendered drink indispensible, when cold water might be injurious. Spirits, of course, should be utterly proscribed.

One circumstance, however, should always be kept in mind, to wit, that when a course of temperance is fully entered on, no consideration should induce us to commit an occasional debauch, especially during our seasoning; for we are at those times in infinitely greater danger of endemic attacks, than the habitual bacchanal.

It has been remarked, by many sensible observers, that *acids* are injurious to the stomach and bowels, between the tropics. I will not contradict, though I cannot confirm this observation. I never saw any bad effects myself from their use; and I knew some medical gentlemen, long resident in India, who drank very freely of sherbet, at all times when thirst was troublesome. Nature seems to point out the vegetable acids, in hot climates, as grateful in allaying drought and diffusing a coolness from the stomach all over the body. It is very probable, however, that where the alimentary canal is in an irritable state, they may excite diarrhœa; and this last frequently leads to more serious disturbance in the functions of the digestive organs. Where the tone of the stomach, too, is weak, (as is often the case) and that organ is disposed to generate acidity, the acids in question may readily prove injurious.

It has also been said, that a too free use of cocoa-nut water, or milk, as it is sometimes called, has produced bowel complaints. My own observations are not in unison with this remark. It was my favourite beverage, and never did I feel in my own person, or perceive in others, the slightest inconvenience from indulging in this most delicious liquid. It ought however, to be fresh drawn, limpid, sweet, and never drunk after the deposit on the inside of the shell begins to assume the form of a consistent crust.

I have alluded to the danger of drinking cold fluids when the body is heated, and particularly where perspiration has continued profuse for any time. I could furnish many instances, illustrative of this position, but shall only adduce the following:—

Lieutenant Britton, of the Royal Marines, (at that time belonging to his Majesty's ship Grampus) a very fine young gentleman, had heated and fatigued himself, by driving about the streets and bazars of Calcutta, in the autumn of 1803, in which state, he had the imprudence to swallow an ice-cream, for the purpose of allaying his thirst. Of the effects of this he died, a few weeks afterwards, on his passage to Madras, under my own care. It brought on inflammation about the fauces, which subsequently spread down along the membrane lining the trachea, to the lungs, producing symptoms exactly resembling croup. He died in dreadful agonies, flying from one part of the ship to another, for relief from the dyspnœa and oppression on his chest. Various remedies were tried, but all in vain.—Let this prove a caution to the

living! "The danger, says Dr. Dewar, of drinking cold "water in that state of the system, was most striking when "a copious draught was quickly taken after extraordinary "heat and fatigue. An acute pain was instantly produced "in the stomach, and rapidly extended through the rest of "the body which threatened to over-power the whole vigour "of the frame." *On Dysentery, p.* 50. A navy surgeon died at Marmoice in Asia Minor, after a very short illness contracted by taking a draught of cold water in a hot state of body. For numerous examples of a similar nature, see Currie's *Medical Reports.*

EXERCISE, &c.

SEC. IV.—This is one of the luxuries of a northern climate, to which we must, in a great measure, bid adieu, between the tropics. The principal object and effect of exercise in the *former* situation, appear to consist in keeping up a proper balance in the circulation—in supporting the functions of the skin, and promoting the various secretions. But perspiration and certain secretions (the biliary, for instance) being already in excess, in equatorial regions, *a perseverance* in our customary European exercises, would prove highly injurious, and often does so, by greatly aggravating the natural effects of climate. Nevertheless, as this *excess* very soon leads to debility and *diminished action*, in the functions alluded to, with a corresponding *inequilibrium* of the blood, so it is necessary to counteract these, by such active or passive exercise as the climate will admit, *at particular periods of the day or year*; a discrimination imperiously demanded, if we mean to preserve our health. Thus, when—

> ——— vertical the sun
> Darts on the head direct his forceful rays,

for several hours in the day, on the plains of India, not a leaf is seen to move—every animated being retreats under cover—and even the "*adjutant*" [gigantic crane] of Bengal, whose stomach will bear an ounce of emetic tartar without complaining, soars out of the reach of the earth's reflected heat, and either perches on the highest pinnacles of lofty buildings, or hovers in the upper regions of the air, a scarcely discernible speck.

> ——— Now, while the blood
> Too much already maddens in the veins,
> And all the finer fluids through the skin
> Explore their flight,

the peaceful Hindoo retires, as it were instinctively, to the innermost apartment of his humble shed, where both light and heat are excluded. There he sits quietly, in the midst of his family, regaling himself with cold water or sherbet, while

a mild, but pretty copious perspiration, flows from every pore, and contributes powerfully to his refrigeration.*

As soon as the cool of the evening, however, commences, all Nature becomes suddenly renovated, and both men and animals swarm in myriads from their respective haunts! Then it is, that the esplanade at Calcutta, and the Mount road near Madras, pour on the astonished eye of the stranger a vast assemblage of all nations, casts, and complexions, comprehending an endless and unequalled variety of costume and character, hurrying to and fro, in all kinds of vehicles as well as on foot, enjoying the refreshing air of the evening! The same scene is witnessed early in the morning, particularly during the cool season, in Bengal; but in the rainy season there, and while the hot land-winds prevail on the Coromandel coast, the life of an European is irksome to the last degree! Perspiration being then profuse, the most trifling exertion is followed by languor and lassitude. Cooped up behind a *tatty*, or lolling about under a *punka*, he can neither amuse his mind, nor exercise his body, and *tædium vitæ* reigns uncontrolled during these gloomy periods! It need hardly be urged, how injurious active exercises would be to Europeans, at such times; or indeed, during the heat of the day, at any time. Yet hundreds annually perish from this very cause; particularly in the West Indies, after each influx of Europeans during war!

Who would expect to find *dancing* a prominent amusement in a tropical climate? The natives of the West Indies are excessively fond of this exercise; but in the East there are *wise men* still, for instead of dancing themselves, they employ the *nautch-girls*, whose *principal* business consists in

> "Gayly *tripping* as they go
> On the light fantastic toe."

It might seem ill-natured if I animadverted on the custom of my fair countrywomen, who *shew off* with such eclat, at the *Pantheon* near Madras, regardless of all thermometrical indications. The practice is not *salutary*, however *politic* it may be found—and it certainly does not *appear* to agree so well with *married* ladies as with *virgins*, whatever may be the reason.

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* What with the smoke of the house [for there is no chimney] and the oil on his skin, a native is hardly ever annoyed by mosquittoes, as foreigners are.

I have shewn that the range of atmospherical heat is considerably higher in the East than in the West, and that in the latter part of the world they are exempted from hot land-winds, and more favoured with cool sea-breezes, than the inhabitants of the former. Still, Europeans, although they may not enjoy better health, experience infinitely less mortality in the peninsula of India, than in the West Indian Archipelago. If a thousand European troops, for instance, are debarked at Kingston, Jamaica, and an equal number at Madras, at the same time, we shall find the former lose, in all probability, one-third—perhaps one-half their number, during the first eighteen months: while the other corps will not lose more than a thirtieth or a fortieth part of their total, in the same period. But if we examine the two bodies of men at the end of five or six years, we shall not find the same disproportion. Hepatic and dysenteric complaints, by that time, will have brought the Eastern corps somewhat nearer a *par* with their Western countrymen. The great *onus* of disease bears on the *first year* of a European's residence in the West Indies, because that is the period within which the endemic or yellow fever makes its attack; after which, he feels the effects of climate in a more moderate degree.—In the East, fever (excepting in Bengal) is by no means general; and the first year is not distinguished by mortality. But the climate being much hotter, and the atmospherical vicissitudes more sudden and extensive, each subsequent year produces great mischief in important organs; and the wonder is, why he does not suffer infinitely more than the Anglo-West Indian!

I have already adduced several causes for this disparity; (vide pages 78-9, &c.) one, the greater length of an East India voyage, with its concomitant abstemious regime, the reverse of which so much predisposes to the violent assaults of the Western endemic. Another, is the laudable temperance and decorum, prescribed by general custom in the Eastern world, obviating, in no slight degree, the deleterious influence of climate. I shall now proceed to make some observations on other differences in the modes of life, and means of preserving health in the two countries, as elucidatory of this subject, hoping that the interest and utility of the discussion will sufficiently excuse its informal position in this section.

First, then, the HOUSES of the East, whether permanent mansions or temporary *bungalows*, are better calculated for counteracting the heat of the atmosphere than those of the

West. As there is no dread of earthquakes or hurricanes, in the former place, the dwellings are *solid*—the apartments lofty—the windows large, and the floors, in general, composed of *tarras*, which, being often sprinkled with water, is cool to the feet, and diffuses an agreeable refrigeration through the room. Add to this, that the spacious *verendahs* ward off the glare of the sun, and *reflected* heat, (an important consideration) by day, and afford a most pleasant retreat in the evening, for enjoying the cool air. The *tatties*, which are affixed to the doors and other apertures, in the hot season, and kept constantly wet by *bheesties*, or water-carriers, whereby the breeze is cooled by evaporation, in its passage through the humid grass, of which the tatty is constructed, prove a very salutary and grateful defence against the hot land-winds ; since this simple expedient makes a difference of twenty or thirty degrees, between the *bheesty's* and the *European's* side of the *tatty!* It appears, however, that in the East we have not been sufficiently attentive to the prevention of *reflected heat and glare;* a circumstance of infinitely greater consequence than the freest ventilation. Let us learn from the native. His habitation has very few apertures, and those high up. His floor, and the inside of the walls, are moistened two or three times a-day, with *a solution of cow-dung in water*, which, however disagreeable to the olfactories of an European, keeps the interior of the dwelling as cool as it is dark. Here he sits on his mat, enjoying his aqueous, but salutary beverage ; and with such simple means and materials, counteracts the heat of the climate more effectually than the European, in his superb and costly edifice. "Those who live in houses," says Dr. Winterbottom, "the walls of which are plastered with mud, frequently, during the continuance of hot weather, wet the walls and floor, to cool the air : this is a very *hurtful* practice, as it renders the air *moist*, and brings it nearly into the state it is in during the rainy seasons."—On Hot Climates, p. 16. This, like many other observations founded on *contracted* views, and favourite theories, is completely contradicted by the broad basis of facts. It reminds us of a passage in Dr. Robertson's third volume on the Diseases of Seamen, where he undertakes to prove, that it is the *moisture* of the air over marshes that causes disease ; and, in short, questions whether *miasmata* ever produced fever——*except on board the* WEAZLE *sloop of war, when he was surgeon of her, on the coast of Africa!!*

The upper classes of natives, also, have not been inattentive to the prevention of reflected heat. The houses of Benares, for instance, are of solid stone, and generally six stories high, with small windows. The streets are so extremely narrow, that the sun has very little access to them; obviating thereby the disagreeable effects of glare. The windows are small, because, from the height of the houses, it would be impracticable to apply tatties during the hot winds; whereas, in low country-houses, or bungalows, they are large, in order to extend the refrigerating influence of the tatties.

The dazzling whiteness of European houses in India, is not only inconvenient, but in some degree injurious, to the eyes, at least; and a verendah, entirely encompassing the mansion, would contribute greatly to the refrigeration of the interior apartments; the most comfortable of which, by the by, on the ground floor, used to be appropriated to the use of palankeens and lumber, but are now wisely converted into offices, &c.

The *punka*, suspended from the lofty ceilings of the Eastern rooms, and kept waving overhead, especially during our repasts, is a very *necessary* piece of what may be fastidiously styled "Asiatic luxury." Indeed, were it not for this and the *tatty*, some parts of India would be scarcely habitable by Europeans, at certain seasons.

It is observed, in a recent "Account of Jamaica," by a gentleman long resident there, that the "*Asiatic effeminacy*" of being carried about in a palankeen, has not yet reached the West Indies. It would be well if several other Asiatic effeminacies [temperance, for example] were more generally adopted in the transatlantic islands. But that the Anglo-West Indian rejects this luxurious vehicle, *merely* through any scruple respecting its *effeminacy*, is rather too much for credence. If a dozen of sturdy *balasore-bearers* could be hired in Jamaica for the trifling sum of four or five shillings a-day, including all expences, the Western nabob and nabobess would soon condescend to recline in their palankeens, with as much state as their "*effeminate*" brethren of the East. But the plain reason is, that neither the country itself nor its *imported* population will admit of a conveyance, which is cheap, elegant, and convenient, on the sultry plains of India.*

* Cheeks of kuss-kuss, a sort of grass, of which the *tatties* are made, being affixed to the doors of palankeens, and kept moist, enable Europeans to travel during the hottest weather. A wet *palampore*, or covering of calico, is a tolerable substitute.

Gestation in a palankeen, however, is a species of passive exercise exceedingly well adapted to a tropical climate. The languid circulation of the blood in those who have been long resident there, is pointedly evinced by the inclination which every one feels for raising the lower extremities on a parallel with the body, when at rest; and this object is completely attained in the palankeen, which indeed renders it a peculiarly agreeable vehicle. On the same principle we may explain the pleasure and the utility of *shampooing*, where the gentle pressure and friction of a soft hand, over the surface of the body, but particularly the limbs, invigorate the circulation after fatigue, and excite the insensible cuticular secretion. I much wonder that the *swing* is not more used between the tropics. In chronic derangements of the viscera it must be salutary, by its tendency to determine to the surface, and relax the sub-cutaneous vessels, which are generally torpid in those diseases. It might be practised in evenings and mornings—and within doors, when the state of the weather, or other circumstances, did not permit gestation, or active exercise in the open air.

A propensity towards *smoaking* would not be expected, *a priori*, in a tropical climate. Yet the practice is very general among Europeans and Natives, and seems to spring from that listlessness and want of mental energy, so predominant in the character both of sojourners and permanent inhabitants of sultry latitudes. As the custom may not be insalutary at certain seasons of the year, in particular places, where marshy or other deleterious exhalations abound; and as it is often a succedaneum for more dangerous indulgences, it is best, perhaps, to pass it over with little comment. Yet it has ever appeared to me a degrading habit, for a gentleman to become a *slave* to his hookah; and it is beyond endurance, to see a great, lusty *hooka-burdaar*, insinuate the pipe of his long *snake* into the delicate hand of an European lady, after dinner, who plies the machine with as much glee, as the sable and subordinate nymph of the country does her *nereaul*! For the honour and delicacy of the sex, this practice is by no means common; and the wonder is, that it ever should have existed.

In the article of *dress*, the Anglo-East Indians have a manifest advantage over those of the West. The delicious and salutary beverage of *cool drink*, too, is more in use among the former than the latter; partly owing to custom, and partly to opulence, which enables all ranks of Europeans

to have their wine, water, &c. refrigerated with salt-petre, by a particular servant, set apart for that sole purpose, and called in Bengal—*Aub-daar*. The effect of these gelid potations on the stomach is diffused from thence, by sympathy, over the whole frame, but especially over the external surface of the body, counteracting, in no mean degree, the natural influence of the climate. It is true, the bottles are brought on table, in the West Indies, enveloped in wetted napkins; but the effect is far inferior to that produced by the nitrous solution; and as the aubdaar's art is extended to all kinds of drink, this grateful luxury is ever at hand.

BATHING.

Sec. V.—"I dare not," says Dr. Moseley, "recommend cold bathing; [in the West Indies] it is death with intemperance, and dangerous where there is any fault in the viscera. It is a luxury denied to *almost all*, except the sober and abstemious females, who well know the delight and advantage of it."—3d ed. p. 90. In respect to its being "death with intemperance," I believe that numerous inebriates could tell the doctor a different story; but, as it is presumed he never deigns to look into a modern author, he is unacquainted with various facts that militate against his dogma. The well-known instance of Mr. Weeks of Jamaica, who always went to sleep in cold water, when intoxicated, is sufficiently in point. Many a time have I seen it bring the drunken sailor to his senses at once; and *invariably* have I observed it to moderate the excitement of spirituous potations. I knew a gentleman who always went to sleep with his head on a *wet swab*, whenever he had taken a good "*mosquitto dose*;" and the consequence was, that he very seldom complained of head-ache next day. It is true, that if the cold bath be injudiciously used, during the indirect debility *succeeding* a debauch, there may not be sufficient energy in the constitution to bring on re-action; and then, of course, it would be injurious. But this is a discrimination to which the genius of a Moseley could not stoop. Granting, however, what is certainly true, that the cold bath is dangerous, where visceral obstructions obtain, I cannot conceive why it should be denied to *almost all*, except females, in hot climates; unless we take those visceral derangements with us from Europe. Surely we might be allowed "the delight and advantage" of it, till these disordered states occur!

But whatever miserable *theory* may have discouraged bathing, and recommended the use of "gently stimulating liquids," in the West; wide *experience* has completely settled these points, long ago, in the East. There, the Native and European—the old and the young—the male and the female, resort to the BATH, as the greatest luxury, and the best preservative of health. In truth, it is one of the most powerful engines we possess, for counteracting the destructive influence

of a hot climate, because it connects the most grateful sensations with the most salutary effects—it is indeed both *utile et dulce*.

Nature, or instinct itself, points out the external application of cold water to the body, to moderate the action of atmospheric heat. The buffalo is a familiar example. In the middle or hot period of the day, these animals repair to pools or marshes, and, wading in, either stand or lie down there, with every part except the nose immersed in water; or, where there is not water, in the mud. At these times, by the by, it is very dangerous for Europeans to approach their haunts. They generally start up all at once, on being disturbed; and if one or two begin to snort and advance, the European is in imminent peril: nothing but the most rapid retreat to a place of safety, can secure his life! A red coat is a very unfortunate dress at such critical rencontres, as the animals in question have a decided antipathy to that colour.

It requires but little penetration to see, that the Brahminical injunctions, relating to ablutious, were founded on the preservation of *present* health to the body; though the *future* happiness of the soul was artfully held out as a superior inducement to the performance of these ceremonies, so necessary beneath a burning sky. The superstitious Hindoo rarely omits bathing, once or oftener, every day, in the sacred stream of the Ganges [or other consecrated river], from which he is not deterred even by the voracious alligator, who frequently carries him off in the religious act! He generally wades out to a moderate depth—then, shutting his eyes, and putting his fingers in his ears, he squats himself under water two or three times—washes his *doty*—and returns, cool and contented, to his humble cot.

The Europeans and upper classes of Mahommedans, however, feeling no great desire for risking *tete-a-tete's* with sharks or alligators, are, in general, satisfied with a few pots of cold water thrown over their heads at home, once, twice, or oftener every day, according to the season of the year, and the person's own inclinations. This, being unattended either with fatigue or expence, is well adapted to all circumstances and situations, and answers the end in view effectually enough.

I have shewn, in various parts of this essay, that most of the diseases of tropical climates are attributable to *atmospherical vicissitudes*. Now, there is nothing that steels the human

frame, with more certainty, against the effects of these, than the cold bath. We are the very creatures of habit; and, consequently, *habituation* is the surest prophylactic. The cold bath not only counteracts the influence of heat, by suspending its operation for the time, but it safely inures us to the sudden application of cold, the fruitful source of so many disorders. By keeping the skin clean, cool, and soft, it moderates excessive, and supports a natural and equable cuticular discharge; and from the "*cutaneo-hepatic sympathy*," so often noticed, the functions of the liver partake of this salutary equilibrium—a circumstance hitherto overlooked. The use of the *cold bath*, then, should be regularly and daily persevered in, from the moment we enter the tropics; and when, from long residence there, the functions above alluded to begin to be irregular and defective, instead of in excess, we may prudently veer round, by degrees, to the *tepid bath*, which will be found a most valuable part of Tropical Hygiene among the *seasoned* Europeans.

As the cold bath is passive (for it is seldom that the exhausting exertion of swimming accompanies it) so it may be used at any period of the day; though the mornings and evenings are generally selected by Europeans in the East; immediately after leaving their couch, and before dinner. The bath is very refreshing, when we rise unrecruited from a bad night's rest; and powerfully obviates that train of nervous symptoms, so universally complained of by our countrymen between the tropics. Before dinner it is salutary, apparently from that connexion which subsists between the external surface and the stomach, in consequence of which the tone of the latter is increased, and the disagreeable sensation of thirst removed, that might otherwise induce to too much potation during the repast.—It is, however, imprudent to bathe while the process of digestion is going on in the stomach, as it disturbs that important operation. Where visceral derangements of any extent, particularly in the liver, have taken place, the cold bath must be hazardous, from the sudden afflux of blood directed from the surface to the interior, and also on account of the subsequent vascular reaction. The tepid bath, taking care to avoid a chill afterwards, will, in these cases, be substituted with great advantage.

SLEEP.

"Tir'd Nature's sweet restorer, balmy sleep!"
YOUNG.

SEC. VI.—When we bid adieu to the temperate skies of Europe, with all its

"Long nights of revelry and ease,"

and enter the tropics, particularly in the Eastern hemisphere, we may calculate on a great falling off in this "solace of our woes." The disturbed repose, which we almost always experience there, has a greater influence on our constitutions than is generally imagined, notwithstanding the silence of authors on this subject. Nature will not be cozened with impunity. Whatever we detract from the period of our natural sleep, will assuredly be deducted in the end, from the natural range of our existence, independently of the predisposition to disease, which is thus perpetually generated. This is a melancholy reflection; but it is truth, and it should induce us to exert our rational faculties in obviating the evil.

When the sun withdraws his beams, and the intense heat of the atmosphere is mitigated, we might expect a comfortable interval of repose—but this would be a vain hope. A new host of foes instantly appear in arms to annoy us! Mosquitoes, ants, and cock-roaches, lead on the insect tribes—the bat wheels in aerial circuits over our heads, on which he sometimes condescends to alight, without ceremony—while the snake patroles about, in the purlieus of our apartment; coils himself up under our beds, or even deigns to become our *bedfellow* without waiting the formality of an invitation!*

The great object of a European is to *sleep cool*. This enables him to procure more rest than he otherwise could do; and, by giving his frame a respite, as it were, from the great stimulus of heat, imparts to it a tone and vigour—or as Dr.

* Many instances have occurred of snakes being found coiled away between children in bed. It is said, that if a chaffing-dish, filled with clear, live embers, be quietly placed on the floor of a room, in such emergency, the reptiles will repair to it; especially if some new milk be also left near the chaffing-dish.—Great presence of mind is here necessary, in order not to disturb those dangerous creatures suddenly in their retreat.

Darwin would say, "an accumulation of excitability," so necessary to meet the exhaustion of the ensuing day, as well as to repair that of the preceding.

A great waste of strength—indeed, of life, arises from our inability, on many accounts, to obtain this *cool* repose at night. Thus rains, heavy dews, or exhalations from contiguous marshes, woods or jungles, often render it unsafe or impossible to *sleep in the open air;* a practice fraught with the most beneficial consequences, where the above-mentioned obstacles do not prevent its execution. But, pending the hot and dry season in Bengal, and almost always on the Coromandel coast, except during the hot land-winds, or at the change of the monsoons, we may indulge, not only with safety, but with infinite advantage, in the seemingly dangerous luxury of sleeping abroad in the open air.

I am well aware of the prejudices entertained against this custom, by great numbers, both in and out of the profession; but I am convinced, from personal experience and observation, that the practice, under the specified restrictions, is highly salutary, and I know it is sanctioned by some of the best-informed veterans, who have spent most part of their lives between the tropics. Speaking on this subject, the judicious Captain Williamson remarks that—" few, very few instances could be adduced, of any serious indisposition having attended it; while, on the other hand, it is confessed by all who have adopted it, that the greatest refreshment has ever resulted; enabling them to rise early, divested of that most distressing lassitude, attendant upon sleeping in an apartment absolutely communicating a febrile sensation, and peculiarly oppressive to the lungs."—*East India Vade-Mecum.*

If it be observed, that I have all along held up to view the danger of atmospherical vicissitudes, to which this practice would *apparently* expose us; I answer, that I have also maintained, that *early habituation* to these was the surest preservative against their injurious effects, as exemplified in the use of the bath. The truth is, however, that while the custom of sleeping in the open air steels the human frame against these same effects, it is, in reality, attended with less exposure to *sudden atmospherical transitions* than the opposite plan. Nature is ever indulgent when we observe her ways, and obey her dictates. Excepting the periods and places alluded to, the *transition in the open air,* from the scorching heat of the day to the cool serenity of night, is gradual and

easy. To this the human frame bends with safety, and we sink into a grateful and sound sleep, that renovates every corporeal and mental faculty. Whereas, those who exclude themselves from the breath of heaven, whether from necessity or inclination, become languid, from the *continued* operation of heat, and the want of repose; in consequence of which, the slightest aerial vicissitude (either from leaving their couch, or admitting a partial current of cool air, which they are often compelled to do) unhinges the tenor of their health, and deranges the functions of important organs! These are they, who require the afternoon *siesta*, and to whom, indeed, it is necessary, on account of the abridged refreshment and sleep of the night; while the others are able to go through the avocations of the day, without any such substitute—a great and manifest advantage!

> The nerves so temper'd never quit their tone—
> No chronic langours haunt such hardy breasts.

Indigenous custom is, generally speaking, in favour of sleeping in the open air, during the hot seasons, in most Eastern countries. The practice, indeed, is less adopted in Bengal, for very obvious reasons, than on the Coromandel coast; but the Native sleeps much cooler, at all times, than the European, from this circumstance—that his bed seldom consists of more than a *mat*, while a piece of *calico* wrapped round him, supplies the place of bed clothes. The more closely we imitate these, the better will it be for us. Indeed, a thin hair mattress, with a sheet and palampore, are the only requisites, independently of the thin gauze or mosquito curtains, which defend us from insects, and, when we sleep out on the *chabootah*, arrest any particles of moisture that may be floating in the atmosphere. Early hours are here indispensible. The fashionable nocturnal dissipation of Europe would soon cut the thread of our existence between the tropics. The order of nature is never inverted with impunity, in the most temperate climates; beneath the torrid zone, it is certain destruction. The hour of retirement to repose should never be protracted beyond ten o'clock; and

> "Soon as Aurora, daughter of the dawn,
> "With roseate light impearls the dewy lawn,"

we should start from our couch, to enjoy the cool, the fragrant, and salubrious breath of morn.

We shall conclude this section with a few remarks on Incubus, or Night-mare—a very troublesome visitor to a tropical couch.

The *proximate cause* of Incubus has given rise to various speculations. A very general opinion prevails that this affection is produced by mechanical obstruction to the blood's circulation, from particular position of the body. It is a certain fact, however, that no posture is a security from night-mare among the predisposed; neither is a full stomach to be accused as the cause, nor an empty one to be expected as the antidote of this disorder. There is, however, an almost universal opinion, that incubus attacks persons *only* while on their backs! and this opinion *seems* to have some foundation in fact, from the following circumstances. One of the symptoms almost inseparable from the disease is this, that the patient *appears to himself* to be kept down upon the back by some external force; and as, at the moment of recovering the power of volition, a great confusion of ideas prevails, a person may easily imagine that he has recovered himself by some effort of his own, by turning from his back to his side. But these things are extremely fallacious, as there is no trusting to the senses during a paroxysm of incubus.

It appears, however, from the mode of treatment to which this disease gives way, that the primary cause, in whatever manner it may act, has its seat in the digestive organs, and that night-mare originates in defective digestion, whereby the food, which should be converted into good chyle, is transformed into a half-digested mass of *acid* matter, which is productive of heart-burn, eructations, flatulence, gripes, with the whole train of dyspeptic and hypocondriacal complaints.

There are many stomachs which convert every thing they receive instantly into an acid; and such will be generally found to be the case with persons subject to habitual night-mare, or frightful dreams and disturbed sleep. Such stomachs are too frequently distended with some acid gas, which alone gives rise, in many cases, to paroxysms of incubus; and may often be instantly removed by any warm cordial, as peppermint, gin, brandy, carbonate of ammonia, &c. Whytt used generally to take a small wine-glass-full of brandy going to bed, in order to keep off night-mare and terrific dreams, to which he was very subject.

Of all medicines, however, the carbonate of soda, taken in a little ale or porter, as recommended by Mr. Waller,

will be found the most efficacious. About a scruple, going to bed, is a sufficient dose; and where acidities prevail in the stomach, the same quantity, twice in the day, will be useful. This medicine not only neutralizes any acid in the first passages, but likewise brings away by stool, vast quantities of viscid slimy matter, so acrid as to burn and excoriate the parts it touches. The appetite now generally improves; but the propensity to acidify remains for a long time in the stomach, and requires great attention to diet and regimen.—There are few people with whom particular kinds of food do not disagree, and these being known should be avoided.—Thus chesnuts or sour wine will almost always produce Incubus among those predisposed to it, as was observed by Hildanus. "*Qui scire cupit quid sit Incubus? Is ante somnum comedat castaneas, et superbibat vinum fœculentum.*" In this country, cucumbers, nuts, apples, and flatulent kinds of food, are the articles most likely to bring on Night-mare.

The following draught I have found very efficacious in preventing attacks of Incubus, viz. carbonate of ammonia, ten grains, compound tincture of cardamoms, three drachms, cinnamon water, two ounces, to be taken going to bed.

Intemperance of any kind is hurtful. Most vegetables disagree; and pastry, fat, greasy, and salted meat, are to be avoided. Moderate exercise is as beneficial, as sedentary employments, intense study, and late hours are prejudicial.

THE PASSIONS.

Sec. VII.—I have not yet alluded to the conduct of the Passions, because most of the precepts that apply to the regulation of them in cold climates, will be equally applicable here. But I may be permitted to correct an erroneous (I think), though very general opinion, that there is something peculiar in a tropical climate, which excites certain passions in a higher degree than in temperate regions. "There is," says Dr. Moseley, "in the inhabitants of hot climates, unless present sickness has an absolute control over the body, *a promptitude and bias to pleasure*, and an alienation from serious thought and deep reflection. The brilliancy of the skies, and the beauty of the atmosphere, conspire to influence the nerves against philosophy and her frigid tenets, and forbid their practice among the children of the sun."—p. 87. This is a very superficial, and a very false view of the affair. It is likewise a very immoral one; for it furnishes the dissolute libertine with a *physical* excuse for his debaucheries, when the real source may be traced to relaxation of religious and moral principles! I would ask Dr. Moseley to explain the reason why, if the "*promptitude* to pleasure" be increased in a hot climate, the *ability* to pursue or practise it should be lessened?—a truth well known to every debauchee.

If the prevalence of polygamy in warm climates be adduced, I answer, that in countries where plurality of women is allowed, a minute and accurate investigation will shew, that among the lower orders of people the licence of the prophet is an empty compliment, for *they* find one wife quite enough. And as for the *higher ranks* of society, there is not *one in twenty* who has more than one wife, nor one in five hundred who has more than two. If we compare this last part of the statement with the picture of life in the *beau monde* at home, we shall not have much reason to congratulate ourselves on the great *physical continence* resulting from our gloomy skies, as contrasted with the "bias to pleasure" which springs from levity of atmosphere between the tropics.

May we not attribute the premature decay of Native women in hot climates, to the long-established custom of early marriages in that sex, originally introduced by the despotism of man, but which has now effected an actual degeneracy in the female part of the creation. "It is a disgrace

to a woman not to be married before twenty years of age; and we often see wives, with children at their breasts, as soon as they enter their teens." I have not a doubt that, to the continued operation of this cause, through a long series of centuries, is owing the deterioration in question; for it is not conformable to the known wisdom of the Creator, that such an inequality should *naturally* exist between the sexes.

But to return. The removal of religious and moral restraint—the temptations to vice—the facility of the means, and the force of example, are the real causes of this "bias to pleasure;" and in respect to the *effects* of licentious indulgences between the tropics, I can assure my reader, that he will find, probably when it is too late, how much more dangerous and destructive they are than in Europe.

He now has explained to him the nature of this "propensity;" and as the principal cause resides neither in the air, nor the "brilliancy of the skies," but in his own breast, he has no excuse for permitting it to sprout into the wild luxuriance of unbridled excess.

The monotony of life, and the apathy of mind, so conspicuous among Europeans in hot climates, together with the obstacles to matrimony, too often lead to vicious and immoral connexions with Native females, which speedily sap the foundation of principles imbibed in early youth, and involve a train of consequences, not seldom embarrassing, if not embittering every subsequent period of life! It is here that a taste for some of the more refined and elegant species of literature, will prove an invaluable acquisition for dispelling *ennui*, the moth of mind and body. But even here there is a necessity for caution, as will appear from the following considerations:—

MORBI ERUDITORUM; OR, DISEASES OF LITERATURE.

If the literary classes of mankind, locked up in their libraries, be secure from various morbific causes, to which their brethren in the more active walks of life are daily exposed, they are preyed upon by a host of maladies, in some measure peculiar to themselves. It is a melancholy, but a certain fact, that a high state of intellectual cultivation is rarely attained but at the expense of bodily health; and hence the ludicrous observation of Frederick the Great, that "man seems more adapted by nature for a postillion than a philosopher," is not without foundation in truth.

While the mind is on the rack of thought, the body is inac-

tive; and while a determination of blood is constantly kept up to the head, and consequently an excess of excitability obtains there, the stomach, liver, and alimentary canal become torpid; and hence arise the whole train of nervous, dyspeptic, and hypochondriacal complaints, to which the literary amateur is proverbially subject. To quote the words of a most intelligent physician,* in a letter to the author, on this subject, "unfortunately the physical is too often "in the inverse ratio of the intellectual appetite, and with "the *Bulimia Doctorum* there is too frequently associated a "stomach '*as weak as blotting paper*,' to use Vogel's just "but rather ludicrous comparison." The effects of literary study on the digestive organs, and, through them on the whole body, have been long observed, and sometimes exquisitely described both by poets and physicians. Ovid has painted the victim of intense thought with great spirit—"*pallor in ore sedet, macies in corpore toto*;" but Voschius and Ficinus have given us as good a pathological account of the business as Abernethy, Parry, or any modern physician could do. "Studiosi sunt cachectici, et nunquam bene colorati, "propter *debilitatem digestivæ facultatis.*" *Voschius de peste.* Ficinus is still more particular. "Accedit ad hoc, "quod natura, *in contemplatione;* cerebo prorsus, cordique "intenta, stomachum heparque destituit; unde ex alimentis "male coctis, sanguis crassus et niger efficitur, dum nimio "otio membrorum superflui vapores non exhalant."

This intellectual exertion produces deleterious effects also, by preventing sleep. The tired brain can no more repose, than the overstrained muscles after violent exertion; hence the studies of the day rise in incoherent images at night, or drive away sleep altogether. "Partem noctis, studiis dedico, "non vero sommo, sed oculos, vigiliâ fatigatos cadentesque, "in opera detineo." *Seneca.—Ep.* 8.

But the worst of all is that pest of literature, *Hypochondriasis*, which, in a greater or lesser degree, attaches itself to all classes of the studious.† The various uneasy sensations which the dyspeptic hypochondriac feels, are transformed in his imagination to the most dangerous diseases of which his reading has furnished him with any description.—Indeed so closely do the nervous or sympathetic, simulate

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* Dr. Dickson, of Clifton.

† By the term "*studious*" I do not exclusively allude to the *man of literature;* but to all the more studious classes of the three learned professions; and also to all those of other professions and occupations; where much thought is combined with a sedentary life.

organic derangements, that medical men themselves are often deceived by the similitude, and how much more prone to error must the hypochondriac be, whose whole nervous system is unpoised; where the impressions are conveyed to the sensorium irregularly, and there make the most exaggerated impressions. Thus that flatulence in the stomach, so constant an attendant on sedentary habits and deranged digestion, will often so mechanically disturb the motions of the diaphragm, and obstruct the free action of the heart, that palpitations of this organ and intermissions of the pulse, with strange and distressing sensations in the chest, will be the consequence. Then the hypochondriac takes the alarm. Angina pectoris, polypi, ossification of the valves, &c. arise in frightful review, and aggravate all the symptoms! If, as is almost always the case, he has frightful dreams, and starts suddenly from his unrefreshing slumbers, then hydrothorax or dropsy of the pericardium is his miserable and unhappy lot! In these constitutions, where leanness is so general, a pulsation can be very frequently felt between the pit of the stomach and navel, on making moderate pressure with the fingers. This symptom, which, in reality, is nothing but the action of the aorta, obstructed perhaps by fæcal accumulations, is immediately converted by the literary hypochondriac into an aneurism of the aorta or cœliac artery, and great and direful will be his apprehensions and forebodings.

There is no part of the body where these morbid feelings will not seat themselves, and ape the more serious organic lesions. In the bladder they will imitate stone, and harrass the hypochondriac with the constant dread of lythotomy. In the lungs they will assume the mask of asthma, nay of phthisis itself; and the pseudo-purulent expectoration will confirm the patient in his belief that consumption is his lot!

From their inactive life, torpid bowels, indigestion, and intense thought, the studious are very much affected with head-aches. These are soon converted by the sensitive patient into organic diseases of the brain or its membranes; and epilepsy, apoplexy, or mania itself are set down as the certain consequences that may be daily looked for!

It is no easy task to root this wrong impression out of the imagination, while the morbid sensation retains its seat in the corporeal fabric. Indeed arguments have oftener the effect of riveting the hypochondriac in his opinion, than of persuading him of his error. In truth, it sometimes requires all the discrimination of the physician to distinguish

the real from the pseudo-affection; or, in other words, to draw the line between the sympathetic and organic lesions of the interior organs of the body. When they are proved to be of the former class, nothing but dissipation of mind and exertion of body can effect a cure. By dissipation I only mean the withdrawing the mind from literary pursuits, and from the opportunity of dwelling on the corporeal sensations, such as horse exercise, or any amusement that requires some management, and presents a succession of objects. When Pope wrote

> ———"Study and *ease*
> together mixt sweet recreation,"

he should have substituted *exercise* for ease, as the literary advocate can seldom be at ease *in his brain*, even when walking about, and much less when at rest.

Whenever we find the *diseases of literature* assail us, we should have the *lamp* scoured out and no more oil put in it. It is *night study* that ruins the constitution by keeping up a bewildered chaos of impressions on the brain during the succeeding sleep—if that can be called sleep which is constantly interrupted by incoherent dreams and half-waking trains of thought. Such is the sensibility, and such the irritability of the studious brain and nervous system, that it is even dangerous to indulge in the sight of theatrical representations, as the mimic scene is sure to rise in the distempered imagination, should sleep take place; but more frequently the histrionic impression continues so vivid as to banish all tendency to repose, and the night is spent in tossing on a sea of incongruous images, and floating among the *disjecta membra poetæ!*

As the digestive organs are particularly implicated in the derangements resulting from literary studies, the blue pill and aloes, three grains of the former and one of the latter, should be taken every second or third night, to carry off diseased, and increase the healthy secretions of the liver and alimentary canal. Acidities in the stomach and bowels should be corrected by magnesia and the volatile alkali, while the sea air and bath should, if possible, be enjoyed in the warm season.

> Si sapis queris igitur Salutem,
> En tibi portus patefit Salutis.

MEDICAL TOPOGRAPHY

OF

New Orleans;

WITH AN ACCOUNT OF THE

PRINCIPAL DISEASES

THAT AFFECTED THE

FLEET AND ARMY

OF THE LATE

UNSUCCESSFUL EXPEDITION AGAINST THAT CITY.*

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NEW ORLEANS is situated in 30 degrees of North latitude, and 90 of longitude West from London. It stands on the left bank of the Mississippi, about 100 miles from it's mouth, and may justly be regarded as the capital of this district of the New World, from its commerce, its opulence, and its population. It is the great emporium into which the scattered inhabitants of the upper country and the surrounding desert, pour their cotton and their skins, receiving, in return, many of the necessaries of life, and some of the luxuries of refinement.

* The substance of this Paper appeared *anonymously* in "The Edinburgh Medical and Surgical Journal," about two years ago. Since that period Inter-tropical Dysentery and Fever have occupied a very considerable share of my attention chiefly in consequence of my having selected the former as the theme of my Inaugural Dissertation published last year at Edinburgh. In re-printing these observations on the present occasion, I have made every where such alterations and additions as time and additional reflection have suggested.

The River Mississippi forms a most august feature in the physiognomy of this country. While the majestic grandeur of its stream, and its unexampled length of course, excite the admiration of the naturalist, and its subserviency to the purposes of commerce claims the attention of the statesman, it is no less interesting to the medical philosopher from the direct and conspicuous influence which the distribution of its waters has upon the soil and the health of the country around its mouth. This magnificent river has its source in the remote, and almost unknown, regions of the North-American Continent, Slender in its origin, the infant flood is interrupted by mountains, and broken by cataracts, until it receives the proudly-independent (rather than tributary) streams of the Missouri, the Illinois, and the Ohio, when it rushes irresistibly forward to the ocean, with a current both broad and deep. Pursuing its course with innumerable sinuosities, through fertile meadows over whose vast extent the tired eye cannot stretch,—through sequestered regions where Nature has no one to witness her awful mysteries,—and through the gloom of forests coeval with the creation, it at last, after a course of three thousand miles, pours, by several mouths, the mass of its weary waters into the Gulf of Mexico.

The country around New Orleans is a perfect plain, frequently intersected by the outlets of the river, and not unfrequently, during winter and spring, watered by its inundations. Indeed, the city itself is built upon what may be called a *delta* formed by this *Nile* of the Western World. In a country of this description, it will readily be conceived that marshes are very numerous and extensive; in fact the whole country, especially in winter, is a continued marsh,* with merely solid patches (very fertile indeed) here and there. The few roads, and the site of the different forts, are generally made ground.

Even the ground on which the town stands, bears evident marks of comparatively recent formation, and probably consists chiefly of the attritus of the various soils through which the river passes, mixed with an infinite variety of vegetable remains. On digging a very few feet under the surface, abundance of water, soft mud, and trunks of trees are met

* Abbè Raynal asserts, from statistical observations of Louisiana, that the surface of the Mississippi, in the neighbourhood of New Orleans, is higher than that of the surrounding country. He attempts to explain this phœnomenon in a way rather ingenious than solid. See his Philosophical and Political History, vol. 6th—Book 16.

with. These last have, no doubt, been flooded down, and stranded by the current, where receiving hourly reinforcements of vegetable debris, and other rubbish, the whole has been bound into one immoveable mass by the viscid mud of the river.

The climate too of New Orleans must not be overlooked, as its peculiarity co-operating with the above-mentioned distribution of the mississippi, and alluvial condition of the soil, is the real and only cause of those formidable diseases to which this city and its vicinity are subject. From the end of November to the end of March, notwithstanding the lowness of the latitude, the weather is generally cold and rainy, with frequent sharp frosts. At those times the thermometer (Fahrenheit's) ranges from 20 to 40 in the shade: and there are instances, I have been informed, even in so low a latitude as 29 North, where, in the night, it is only a few degrees above zero. On the contrary, during summer this climate has all the characteristics of the torrid zone; the thermometer stands at 87. or 90. in the shade. At New Orleans especially, the weather is close and suffocating, from its distance from the sea, and consequently the entire absence of that refreshing luxury of a tropical climate—the sea-breeze,—from the air being surcharged with watery vapours, and rendered relaxing thereby, and from the smell of the mud of the river and swamps, which is often, even in winter, very sensibly offensive.

The description here given of the climate and soil of New Orleans will apply, almost without alteration, to the contiguous district of the Floridas, though the aspect of the latter is very different. In the former, indeed, there are many traces of human industry, culture, and refinement; but in the latter, Nature still pours forth her gifts in solitary and comparatively unprofitable exuberance. Never did I see a shore more inauspicious and uninviting! The whole country is a dreary flat, indented with stagnant creeks, salt-water lagoons, and muddy rivers, whose waters scarcely ripple, save with the silent plunge of the alligator, and whose banks are concealed by the darkness of endless woods, that approach to the very brink of the sea, as if envious of its dominion. Here there is no variety—no eminence to relieve the eye while wandering over the insipid level of Dingy-green,—not a single appeal to human feelings or to the kindly emotions of our nature,—not one object, in short, to call forth those mixed associations of interesting simplicity, domestic content, happy industry

and cheerful civilization which constitute the charm of the rural landscape in England,—a charm which the spectator recognizes in the undefined emotions and recollections which crowd and dilate his bosom. On the contrary, the whole scene suggests vague impressions of solitary terror and savage wildness, and presses home upon the heart the chilling ideas of dereliction and desolation.*

The local peculiarities in the climate and soil of New Orleans give rise, during winter, to epidemic dysentery, and in summer, to ardent fevers of a very rapid and dangerous form, from which the inhabitants, but particularly strangers, suffer most severely. The occurrence of such complaints, some readers, from the above detail, will consider as a necessary consequence; and, in my own opinion, it is even so. Lest others however should be sceptical, it shall be my business, by and bye, to make this preliminary picture of the Medical Topography of the country subservient to observations of higher interest, and to prove by facts the reasonableness of opinions.

About the middle of November 1814, the expeditionary force destined to act against New Orleans arrived at Jamaica under the command of Vice-Admiral the Honourable Sir Alexander Cochrane; and the whole fleet of ships of war and transports, having rendezvoused there, took their departure from Negril Bay, at the west-end of that island, about the end of November, full of health and hope.

Before the middle of December, the fleet arrived on the coast of Louisiana, and took steps for disembarking the troops without delay—a measure against which nature seemed to have opposed ample and almost insurmountable obstacles. Moreover the passage of those lakes which formed the only practicable approach was obstructed by five large American smacks or gun-vessels, mounting several heavy guns each, and admirably adapted, from their build, for operating in those shallow waters.

The latter vexatious impediment, however, was soon conquered by our sailors, who shewed, on this occasion, all that

* I am sorry that my account of this district is so entirely opposite to the published opinions of the late venerable traveller, M. Chateaubriand. In hyperbolical raptures, and in the very pith of sentimentality, has that amiable gentleman declaimed about "the oaks of Florida," "the spirit of the desert," "the pleasures of an Indian camp," and all the delightful *et ceteras* of a savage life!——'Tis indeed passing strange. But, "De Gustibus," &c.

" æs triplex,—that hardy, careless, characteristic valour for which they are so illustrious. The boats of the fleet, manned and armed, were sent away, and, after a tiresome row of thirty-six hours, succeeded in penning the enemy up in a creek, where they attacked them against the superior odds of their position and their force, and after a furious engagement, captured every one of them. This achievement was decidedly gallant, and would have stood amidst the most brilliant feats of naval warfare, had not the subsequent failure of the main object of the expedition thrown a bleak shade over its lustre.

About the beginning of January (1815) bowel complaints, which had previously appeared amongst the boats' crews and the fatigue-parties of the army, began to be very rife.—They varied in degree of severity, from the milder symptoms of dysentery to its most aggravated forms. I may enumerate in a few words the symptoms of the disease. The patients, for the most part, complained of severe tormina, tenesmus, scanty bloody dejections, want of appetite and strength, general pains and soreness, and a strong disposition to vomit on taking either food or drink. The tongue was white or yellow; the eye languid; the pulse above 100, small and easily compressed; the skin often dry, or covered with clammy sweat, but always considerably increased in temperature.

The causes were, generally speaking, obvious enough.—The men had been rowing all day, and sleeping all night in the open boats. They had incautiously drank the brackish water of the lakes, and had sometimes been obliged to eat their beef or pork raw, when, on an emergency, they were deprived of an opportunity of cooking it. They were often drenched with rain, or dripping with spray, without being able to put on dry clothes. Added to all this, the weather was extremely cold, particularly in the night, the thermometer before sun rise being often as low as 25 or 26 degrees, rising no higher during the day than 30 or 38 degrees, and seldom above 50.*

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* The Physiologist might have contemplated with interest, on this occasion, the marked difference in the effect of cold on the European and the African constitutions. While the former were, comparatively, only incommoded, the latter were severely injured by it. Many soldiers of the Negro Regiments had their feet frost bitten, and lost their toes by the consequent gangrene and sphacelus. Some of them even died in the camp or in the boats, from excessive cold. Of our own people, many of the boats' crews, and even of the officers, on their return from boat service, were incapacitated for six or ten days, by pain, numbness, shooting, and tingling of the lower extremities. They expressed their distress to be as great as if their feet and legs, from the knees

The locality of the general rendezvous for the boats was very bad (though the best that could be found), being a miry place, covered with reeds, and abounding in miasmal exhalations.

The encampment of the army, too, was on a swampy spot on the left bank of the Mississippi, about six miles from New Orleans. Indeed, the whole vicinity is a swamp, which, after the rains so frequent at that season of the year, became a perfect puddle. Having the Mississippi on their left, they drank its discoloured aud polluted water, and were exposed to the effluvium of its slimy mud, as well as to the paludal exhalations of an impracticable wooded morass on their right. The huts, also, in which the troops were sheltered, were far from being impervious either to rain or cold: so that, upon the whole, the army and navy, in point of privations, were much upon a par.

On the first appearance of Dysentery, its treatment was commenced by a flannel roller bound tight round the abdomen, and ordering flannel clothing next the skin, if the patients had it not already. Saline cathartics, and particularly oleum ricini, with now and then a few grains of calomel, were repeatedly given, until the stools were increased in quantity, and more freely rendered. At the same time, plentiful dilution with tepid gruel, warm tea, rice or barley-water (with a tinge of port wine and a little sugar, so as to remove its nauseous insipidity, and allure the patient to drink it in such quantities as would prove useful), as also decoctions of lintseed or of gum-arabic, I always considered of primary importance as well in promoting the cure, as in alleviating symptoms. Demulcent drinks I hold to be of much moment in this complaint, as they, no doubt, in some measure, defend the irritable or semi-inflamed coats of the bowels from the stimulus of the ingesta, besides sheathing the acrimonious secretions which, during this disease, are unquestionably poured out from the intestinal glands, and supplying the want of excretion from the mucous follicles.—I have had occasion to see even olive oil given with this view, in doses of an ounce or two, and the relief that always followed it, even tho' it had no laxative effect, was very conspicuous.

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downwards, had been *one immense chilblain!* Various remedies were tried for this teasing affection; but nothing I could devise gave any relief. Temporary ease was derived from frequently bathing the feet in cold salt water. This peculiar affection I no where find mentioned by writers on the effects of cold.

When the primæ viæ had been fully evacuated, an attempt was made to restore the natural secretions, and the balance of the circulation, by opening the pores of the skin. Antimonial powder, with opium, was employed for this purpose; but more generally the pulvis ipecacuanhæ compositus, which certainly seemed to succeed best.

Whenever tormina and straining returned in a worse degree than ordinary, a cathartic was given in the morning, followed by a large dose of opium, or an anodyne diaphoretic at night.

Believing, as I firmly do, that wherever there is morbid activity of the vascular, and increased mobility or excitability of the nervous system (the former evinced by undue velocity and force of motion of the heart and great vessels, and the latter by morbid evolvement of animal heat, general pains, lassitude, &c.) *there* bloodletting is very seldom inadmissible, whatever be the name or nature of the disease,—it is almost unnecessary to say that, in the complaint I am now describing, the lancet formed a leading agent in the methodus medendi. Whenever the stools resembled the "lotura carnium," I practised depletion with as much freedom as if there had been active hæmorrhage from the intestines from any other cause;—the amended appearance of the alvine discharges, and the diminution of the pyrexial symptoms not only justified but sanctioned the apparent boldness of a measure, which, I have reason to know, has succeeded equally well in other hands besides my own. Many of our primary cases, however, were not so severe as to require venesection.

By these means, aided by perfect quietude, repose, and low diet, the febrile state soon disappeared, and nothing remained but debility and irregularity of the bowels, which were to be removed by the mistura cretæ cum opio, the infusum quassiæ excelsæ, or the mistura cinchonæ, given thrice or four times a-day, and a gentle laxative once in three or four days.

Many of our earlier and milder cases yielded to this treatment; but those of a severer sort required measures less inert. In these malignant forms of the disease, I began by giving a strong saline or lubricating cathartic. Here, too, bloodletting was very freely practised, when the patients were young and robust, or indeed, whenever the force of the pulse and pyrexia seemed on general principles, to justify it. I never once saw cause to repent of this evacuation, tho' I have more than once carried it to a great extent. It often

moderated local pain of the abdomen, diminished the severity of the griping, and, when practised with prudence, did not perceptibly increase the subsequent debility.—These preliminary steps being taken, I immediately commenced the use of Calomel, and pushed on undeviatingly to salivation, from the belief, which seems to be well-founded, of an occult connection betwixt dysentery and a morbid condition of the liver.

The doses I gave were regulated by the constitution of the patients, and the actual state of the symptoms; but *one scruple* night and morning, was the most usual prescription,—seldom less than ten grains thrice a-day! I gave a scruple night and morning so often, and in such a great variety of habits, that I soon ceased to be at all fearful of hypercatharsis, or, indeed, of any other unpleasant effect. It certainly seldom, in any case, increased tormina and tenesmus, but generally lessened both very materially, and produced five or six large motions, voided with less straining, and less tinged with blood. I have in this way given 16, 24, or 32 scruples of calomel in the course of half as many days, before the mouth became affected. When the gums were fairly sore, with some ptyalism, the calomel was omitted, the tormina, tenesmus, and general fever disappeared *as a matter of course*, and the bowels gradually returned to their natural state, the stools often changing, in one night's time, from a dark brown or *spinage* colour, to a bright healthy yellow, with the odour of natural fæces. Some tonic or stomachic was prescribed during the days of convalescence; and generally, as soon as the mouth was well, the patients were fit for duty.

Calomel was often thus given alone and uncombined; but often I thought it preferable, on account of occasional symptoms, to conjoin with it two grains of opium, or to give at noon (in the interval between the doses of calomel) twelve or fifteen grains of the pulvis ipecacuanhæ compositus. This was done in order to lessen the irritability of the bowels, and to support the cuticular discharge. Under such management, every case recovered where no visceral obstructions existed, or where the co-existent disease of the liver was not irretrievable from having passed into disorganization.

As to the fact of visceral obstructions, I believe they are a more frequent occurrence, even in our own climate, than is generally supposed: but I am persuaded that, of those who have lived for any length of time within the tropics, scarcely fewer than *four-fifths* have one viscus or other in the abdomen, more or less altered by morbid action. This opinion

is deduced from a very considerable number of dissections of such subjects.

Opium is one of those remedies of doubtful utility in dysentery, which has been by some violently decried, and by most rather sparingly used, from its alledged tendency to suspend the natural secretions, lock up the excretory ducts, and check the transpiration by the skin. Candour obliges me to say that I have used it largely, particularly in the chronic forms of the disease, and that I have never noticed any of the unfavourable effects urged against it; but on the contrary can bear witness with the illustrious Sydenham, Dr. John Hunter, and several living authors, to its beneficial power. Given after purgatives, it can seldom be unsafe,—and, if it does no more, it procures a temporary truce from the disease. How important a cessation from suffering is, in every illness, but more especially in so endless and harassing a complaint as dysentery, I need not say—prejudices, probably illusory and theoretical, ought to give way to an advantage so substantial.

Nevertheless it must be admitted, that in the early or acute stage of dysentery, this remedy must be administered with a very cautious and discriminating hand,—inasmuch as, at that period of the disease, inflammation either exists overtly, or disguised under some of its peculiar modifications. Under such circumstances, therefore, it becomes necessary not only to premise the opium with bloodletting and purgatives, but also to combine it with some unirritating diaphoretic, such as pulvis ipecac. aqua acetetis ammoniæ, &c. in order to prevent it from increasing vascular action, and suppressing cutaneous excretion.

Almost the whole body of the profession have concurred in praising injections in this disease. I, of course, defer to the experience of others, while I detail my own. Having found them almost uniformly hurtful, I entirely laid them aside. The irritation produced by the introduction of the pipe, more than counter-balances the soothing effects of the injection. Besides the disagreeableness of this species of remedy, when often repeated, to the good old English habits of delicacy, I have always seen that, were the enema ever so bland, or ever so small in volume, it could not be retained beyond a very few minutes, and always occasioned more straining and tenesmus in the sequel. As a commodious substitute for injections, I have directed patients to insinuate into the anus a *small* crumb or two of opium, softened be-

twixt their fingers for the purpose;—or have caused warm fomentations to be used to the parts, and bladders of hot water to be applied to the hypogastric region. These are wont to succeed so well, that the patients themselves speak in the strongest terms of the relief afforded by them.

The diet of the sick is of the utmost consequence in this complaint. It should be so regulated that nothing *cold* either in the shape of food or drink, be taken into the stomach. Sago, arrow-root, weak soups, &c. may be used during the pressure of the disease; and animal jellies, and other articles, easy of digestion, during convalescence. When the disease has yielded, it is of the first consequence that we do not prematurely indulge the patient with animal food, even though his appetite strongly crave it; for it must be obvious that such food will be received into an alimentary canal, as yet by far too weak to digest or assimilate any but a very small portion of it. Hence springs a dreadful source of irritation to the weak and irregular bowels; and I am satisfied that I have seen some fatal relapses of dysentery brought on by the injudicious kindness of the patient's friends, who have clandestinely indulged him with animal diet, under the erroneous impression of thereby strengthening him. In many other instances, I have seen apparently very venial excesses either in the quantity or quality of the food during convalescence, induce true lienteria: in truth, the latter complaint is too apt to be the consequence of long-protracted attacks of dysentery, do what we will, and be our dietetic restrictions what they may. I need scarcely add that vegetables and fruit, unless well boiled, and used in very sparing quantity, are quite inadmissible,—owing to their proneness to run into the acetous fermentation,—in all instances where the chylopoetic organs are debilitated.

Blisters to the abdomen I have occasionally used, and that with some apparent advantage, in this disease. But, I believe, most practical men will agree with me when I say, that if due use has been made of the lancet at the outset of the complaint, the subsequent and subordinate aid of vesicatories will very rarely be any way essential, or necessary. Besides, they labour under the objection of causing often difficult micturition from the absorption of the cantharides; and it must be recollected that, in most cases of dysentery, strangury is already existing, from sympathy betwixt the bladder and the rectum, while the latter is in a state of constant and almost incon-

ceivable irritation from tenesmus. It might be well to try whether the interposition of a bit of muslin betwixt the blister and the skin, would have the effect, as it is said to have, of preventing the absorption of cantharides.

The advanced-guard of the army was disembarked on the 24th of December, and took up a position on the only road to New Orleans, and there awaited the landing of the remainder. After several minor skirmishes, the troops (with whom the marines of the fleet and the sailors trained to small arms, had previously been incorporated) were formed into columns, and on the morning of the 8th of January, before day-light, advanced to storm the American lines.

These works were defended by a broad ditch filled with water, as also by a palisade, and a wall mounted with numerous pieces of cannon. The enemy, apprised of our intended invasion, had drawn these lines quite across the only route to New Orleans. They were absolutely inaccessible at their flanks, as their right touched the Mississippi, and their left rested on an impassable wooded morass. This was the spot which the laws of nature as well as the rules of art had concurred to strengthen; this was the strait which the Americans would fain compare to the immortal pass of Thermopylæ; but entrenched, as they were, to the teeth, and fighting, in effect, completely under cover, there was no call for the self-denying devotedness of a Leonidas, and no exercise for either the active or passive valour of Sparta.

The attempt to storm failed: our columns were beat back at every point, with a loss, I believe, of more than five hundred killed, and upwards of twelve hundred wounded.

The expedition being thus foiled in its object, the troops were once more collected on board the fleet, and proceeded off Mobille River, to attack the town of that name. Fort Bowyer, which defends the harbour's mouth, being quickly and regularly invested, was captured on the 11th of February: but the ulterior operations were suspended by the arrival, from England, of the news of the peace of Ghent. The troops were disembarked on a sandy uninhabited spot, called *Dauphin-Island*, there to await the ratification of the treaty, and the arrival of such supplies of provisions as would enable them to prosecute the voyage homeward.

It is worthy of remark, that, notwithstanding the almost unexampled fatigues and privations of all sorts to which the army and navy had been exposed while before New Orleans, sickness of any kind, up to the 8th of January, had made comparatively little progress amongst them. The bowel-complaints, though numerous, were, for the most part, easily removed; and no other disease of any consequence prevailed. It is not a little remarkable in the medical history of fleets and armies, that, during the fatigues and sufferings of a hot campaign, or the active progress of war-like operations, the men are very little subject to illness of any sort; as if the elation of hope, and the other great passions with which they are agitated, had the virtue to steel the constitution against the most powerful causes of disease. This circumstance—no less curious than true—proudly proves the ætherial origin of our nature, and goes far to assert the almost omnipotency of mind over matter!—No sooner, however, does a great failure, and the dejection it draws after it,—a cessation of operations and a return to the "vita mollis," allow the spirit of enterprize to flag, than the previous fatigues and exposures begin to tell upon the constitution by their usual results—disease. Like a machine wound up beyond its pitch—the excitement of accumulated motives once withdrawn,—the human frame rapidly runs down, and yields with a facility almost as unexpected as its former resistance. Hence, after a campaign, diseases of every kind are prone to a type of debility and aggravation, and the proportion of deaths is unusually numerous.

Accordingly, in the instance before us, the pressure of ill success began to be severely felt after the failure of the 8th, and the consequent re-embarkation of the army. By this time unremitted fatigue, poor living—and that at short allowance, with the total want of fresh beef and succulent vegetables, not only altered for the worse the character of the bowel-complaints, and produced a fatal relapse in some recently cured, but also introduced scurvy, with its multiplied series of perplexing symptoms. Exposure to marsh-miasmata, also, produced many cases of fever, which were at first intermittent, but, as the weather grew hot, put on the violent remittent, or, more generally, the ardent continued form. The great increase of atmospheric heat which now took place evidently exasperated the type of the prevailing dysentery, as well as that of the fever: this, along with some other facts, which I shall state hereafter, induced me to believe that one

common miasm gives rise to these two forms of disease, and that the former is essentially different from the dysentery of cold climates, which, being merely a vicarious discharge from the intestines, owing generally to suppressed perspiration, is, for the most part, rendered milder, if not altogether extinguished by the genial warmth of the season.

Dysentery now put on that aggravated form in which it has so often scourged our camps and fleets; and never shall I forget the terrible force of this invisible enemy. In all cases it was a very baffling untractable disease, but in those who had previously served long in warm climates, and whose livers were thereby affected, it was almost uniformly mortal. When the disease attacked such persons, it was a subject of melancholy but curious speculation to witness the headlong course of the malady, and how unavailing any species of treatment invariably proved. It knew neither pause nor hindrance, but, like the fabled vulture of ancient mythology, pursued its cruel task from day to day. Dissection always brought to light extensive visceral obstructions, particularly chronic inflammation or abscess of the liver, with or without enlargement of that viscus.

Nothing but experience can convey adequate ideas of the ungovernable nature of this disease, or of the insidious masked approaches of its attack. Days of an indisposion, apparently trivial, sometimes occur, ere the peculiar symptoms of dysentery shew themselves, and would induce a practitioner unacquainted with tropical diseases, and unaware of the peculiar character of the prevailing epidemic, to pronounce the complaint trifling, or as being nothing more than slight fever, symptomatic of gastric disorder;—at other times, smarter pyrexia, and occasionally a pain in the right side, obtuse or acute, followed by frequent copious dark-green stools (like *boiled spinage*), slightly tinged with blood, are the form of the disease.

In most of the cases, griping was little complained of. There was merely a sense of weight in the hypogastric region, and a copious *flux* of green or dark-brown colluvies, voided without straining. The tongue was covered with a yellow fur, which, in the advanced stage of the disease, became thick, dark, and immoveable as a slab of black marble. The pulse was sharp, frequent, and weak: frequent retching and hiccup attended, and a sensation as if all the drink swallowed hot or cool, ran speedily through the intestines. Oftner the complaint would make its attack with the common introduc-

tory symptoms, and no pain in the right hypochondrium was felt throughout the disease, either on inspiration, or strong pressure under the false ribs. In whatever garb of disguise it made its appearance, disease of the liver (as I have before stated), and consequently a vitiated state of its secretions, were undoubtedly the primary cause of the mischief. Dissection of the fatal cases shewed structural derangement, —a soft friable condition, and generally suppuration of that gland. I have often found two separate abscesses in the parenchyma of its large lobe, the one generally less deep-seated than the other, and containing, in some instances, a quart of pus, similar in colour and consistence to what is usually found in psoas abscesses. How such extensive disorganization, and formation of matter could take place without any preceding palpable indication of local mischief, is to me still a mystery. But such was the fact.*

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* Since these observations were first published in the Edinburgh Journal, almost every one has expressed his surprise at the co-existence of such extensive hepatic disease with tropical dysentery: nay, the thing is so striking in itself, and is so contrary to established opinion, that not a few have gone so far as to deny it altogether, or to assert that it must be a very rare occurrence indeed; and that the affection of the liver is merely contingent, and not necessarily connected with dysentery. I think I am warranted by facts in maintaining the contrary.—viz. That the co-existence is very frequent, if not uniform; and that the connection is no less strict than that of cause and effect.

I can, however, well excuse a degree of scepticism on this point, knowing that what happened to myself may equally happen to others,—namely, that many cases of dysentery may be examined after death, without the concomitant disease of the liver being discovered:—for who would dream of cutting minutely into that viscus, in a disease generally supposed to bear no relation to it?

It was by accident I first discovered the fact, and I shall relate it concisely, just as it happened: a Naval Officer, for whose talents and virtues I shall ever entertain the highest respect, whose memory I shall ever affectionately cherish, and whose death I shall ever regret as the loss of a valued friend, was the first on board H. M. S. Cydnus that fell a martyr to dysentery off New Orleans. He happened to die at sea, and it became desirable to preserve his body until we should reach some port, where the funeral honours, due to his rank, might be decorously paid. In order to effect this, it became necessary to remove the intestines. While doing so, I ascertained that the liver was much enlarged, and therefore thought that it also had better be removed. Having separated it from its lateral connections, I passed my hand up under the ribs in order to detach it from the diaphragm. While making a slight pressure for the latter purpose, I was astonished to find the points of my fingers pass through the thin parietes of a large abscess in the upper and central part of the right lobe, from which upwards of a quart of pus forthwith flowed. After the liver had been removed and laid out for minute inspection; I found the abscess of such extent, and so lined in its inner surface with a thick, fretted, and irregular exsudation of coagulable lymph, that it resembled a familiar and homely object,—namely, a large winter glove lined with worsted!—On accurate examination, a second abscess was found, lower down in the large lobe, containing a pint of pus.

This Officer had never at any period of the disease felt any pain in his side;—from his general intelligence, and from the accurate descriptions he gave me daily of his minutest sensations, I am convinced he would have mentioned that pain, had it existed even to the extent of a "sensus molestiæ." Besides, he

On the villous coat of the colon and rectum, there were numerous excoriated points, with small superficial ulcers here and there; but no morbid alterations were found *there* sufficient to account for death :—no gangrene—no ravages in short, like those related by Sir John Pringle, Harty, and others, in their accounts of this malady.

In fact, (to give a condensed view of the whole matter), the phenomena of the cases that recovered, as well as the morbid appearances of those that died, impressed upon my mind a conviction that the diseased condition of the liver was the soil from which dysentery drew its malignant growth, strength and nurture. This was the "fons et origo mali;" by it the dysentery was excited, and only by *its* removal could it be removed! This view of the disease I conceive to be of great consequence, and trust it will meet with due consideration from the profession, inasmuch as it is a view not taken up hastily, or out of complaisance to a favourite hypothesis, but deduced from nearly two hundred cases, and built upon the corner-stone of morbid dissections. I hope the time is not far distant when more accurate observation will teach medical men at large, to regard this disease merely as secondary to, and symptomatic of hepatic affection, and to seek its more immediate cause in a morbid condition of that important organ, the liver. Whatever may be the *mode*

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was one of the last men in the world that one would have suspected of hepatic affection, being florid in complexion, and having previously enjoyed the best health all his life.

Instructed by this insidious case, I had my eye to the liver ever afterwards; but pain of side, or pain on pressure under the ribs, was by no means often felt, though dissection after death brought to light hepatic disorganization equally extensive as in the above case. In many, the liver to appearance, had the colour and size of health, and it was not till on cutting into its parenchymatous substance that the extensive abscesses were discovered.

These facts are of such high importance in the pathology of dysentery, and so much depends upon the degree of credit that may be attached to them, that I am sincerely glad in being *now* able to say, that they do not rest upon my solitary or isolated observation. Within these few days I have been favoured with an excellent and most interesting communication from James Simpson, Esq. Surgeon, R. N. in which he details to me the cases and appearances on dissection of several dysenterics that were treated by him in the East Indies. At the time he made the observation, he was not aware that similar ones had been made by myself in the Western Hemisphere; therefore his remarks must carry with them the force of unbiassed and independent observation. The symptoms before, and the morbid changes after, death, were substantially—nay, exactly —the same as I have detailed in this paper, and in my Inaugural Dissertation: and Mr. Simpson, speaking from the facts he has so often witnessed, expresses his conviction that "future experience will unfold to us that liver-disease is an inseparable attendant of dysentery in warm climates."—I am sorry that want of space prevents me from copying more amply his able and satisfactory details. I have reason to know that the observations of some other practitioners exactly concur with those of Mr. Simpson and myself.

of connection* between hepatic derangement and dysentery, I am convinced from analyzing my own sensations, as well as from having counted in others the links of the pathological chain, that, at least in tropical climates, these two diseases are connected like cause and effect. The practice which most readily removes the disease, too, tends much to confirm me in this conviction; for the "mercurial method" I have pushed to a great extent, and its results have been such as to give it a very decided preference in my estimation. Calomel (that great specific in obstructions of the liver, and justly styled by Dr. Curry of London a *cholagogue*) given in large doses—say one scruple twice a-day—combined with opium, to cause it to be retained in the system, corrects the condition of the liver by emulging its ducts, unloading its congested or over-gorged vessels, removing undue determinations of blood to its yielding texture, prompting the healthy secretion of its peculiar fluid, and thereby resolves Pyrexia. As soon as ptyalism takes place, the dysenteric symptoms disappear, and the appetite gradually returns. Upon the whole, my own experience, as well as that of some others who served on this expedition, warrants a far more certain expectation from this mode of treatment than from the alternation of purgatives with astringents, or any other heretofore in use.—I must

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* About the mode of that connection I have indeed speculated pretty freely and pretty largely elsewhere, having employed a good many pages of my Thesis in the discussion of the ratio symptomatum as well as of the ratio causarum —yet, I must confess, that the opinions are purely, or at least in a great measure, speculative; and that they are not satisfactory even to my own mind.

I shall not farther detain the reader in this place, but pass the matter over entirely, resigning to writers of greater native talent, and better inured to habits of difficult investigation, the task of establishing a theory of the disease which shall at once be rational, and shall satisfactorily explain all the phenomena.

I may, however, be permitted to hint that no hypothesis which has simplicity for its basis will ever explain this disease: unquestionably Dr. Johnson's leading idea is a most valuable one, viz. that in our investigations of this malady we must seek its source not in one morbid cause, but in a series of morbid causes.

I wish it to be distinctly understood that it is my inability alone that induces me not to attempt the theory of this disease; for I shall never fall in with that tone of affected contempt for all theories, in which presumptuous dullness so often shelters its imbecility, and vapid indolence so often masks its habitual and insuperable torpor. Such ill-bestowed contempt may be sufficiently reproved by simply stating the undeniable fact, that not only in medical, but in every other branch of natural and experimental science, few brilliant discoveries have been made except by those acute and industrious men who were labouring to establish some darling hypothesis. Though they were often disappointed of the results they had in view, still they were generally compensated by the discovery of something equally or more valuable;—just as the peasant who was told to dig for hidden treasure, though disappointed of the prize he expected, derived a more rich and permanent treasure, from the digging and fertilizing of the land during his vain search.

here observe, however, that I by no means go the length of saying that dysentery in our own climate always requires the excitement of ptyalism by mercury for its cure; because with us it is almost always a slight disease, and, compared with the fell and fatal form of tropical flux, might be termed the "spurious dysentery." In ordinary cases, therefore, to push mercury the whole length of salivation, would be merely substituting one ailment, and that perhaps a more troublesome one, for another less so: (for let it ever be remembered that ptyalism is not without its inconveniencies, and sometimes not without its dangers, as I myself have seen:) consequently in such instances, if we equalize the circulation by the warm bath, a purgative, and a sudorific or two, we shall generally find the disease yield. Frequent discharges of slimy mucus, attended with tormina, tenesmus, and feverishness, though designated by the general name of dysentery, are, in this country, often dependent merely on aerial vicissitudes and consequent suppression of the cuticular discharge, and differ widely both in their cause and character from the *true* dysentery of warmer, but less salubrious regions. But even in this climate, I contend, the principles of cure here laid down will apply with utility, and that in cases which resist the more ordinary treatment, calomel given in larger or smaller doses (according to circumstances,) will be equally beneficial as within the tropics, provided the patient be always kept in a room whose temperature is between 60 and 70.

I have no hesitation in affirming that at New Orleans the success of the treatment by calomel was far greater than that by the usual mode, and I shall here relate a fact which may be regarded as decisive of the rival merits of the two methods of cure. The *Cydnus* frigate, in which I served, remained in the Gulf of Mexico, after all the rest of our force had retired. From the large expenditure of calomel, I at last had none left, and there was not a grain to be procured.—At this time I had several cases of dysentery, which, from necessity, I was obliged to treat, for several days, on the *old* plan, by neutral salts or oleum ricini alternated with anodyne sudorifics, rhubarb, diluents, mistura cretacea, &c. One case was, indeed, of so bad a type that I had made up my mind for its ending fatally. Luckily, however, our arrival at the Havannah enabled me to procure a supply of good calomel; and I immediately commenced with ten-grain doses thrice a-day. *Next morning* the patient was better; had

passed a more tolerable night; had less tormina and tenesmus, and a cleaner tongue. I increased the dose to one scruple night and morning, and thenceforth his improvement was perceptible from day to day. The pyrexia soon abated, and, in ten days, his dejections from being green and fœtid, had recovered the natural yellow colour or nearly so. No complaint remained but a sore mouth. This patient, like most of the others, had been very liberally bled at the onset of the disorder. He is now living (so far as I know), and is an example of the superior efficacy of this mode of treatment.—The above is merely one of many instances where I have seen calomel work rapidly, and like a *charm*.

To prove with how little apprehension calomel may be given to persons of all ages, I may state that to a boy of 14, *one hundred and fifty-two* grains were given during the acute stage of a most dangerous attack of Dysentery, before his mouth became fairly sore!! He fully recovered.

Though mercury had, in this manner, such commanding influence over the disease, still experience here was not always uniform, for there were several vexatious instances where it failed. I do not speak of the fatal cases, of which, unhappily we had fifteen (for in them neither laxatives, astringents, fomentations, blisters, opiates, mercurial frictions on the abdomen, nor calomel pushed to salivation, ever were able to keep off the unhappy event), but expressly of those few instances where the patients, after being apparently cured, relapsed without any assignable cause, or where ptyalism mitigated the symptoms somewhat—perhaps even suspended the disease entirely until the mouth was well, and then it returned with much of its original violence. The disease thus ran into the chronic form, and harassed the patient for weeks or even months—with the various symptoms arising from a weak irritable condition of the primæ viæ, irregular hepatic secretion, and imperfect formation of the chyme.—The chief of these symptoms were vomiting after meals, night sweats, febriculæ, watching, arid skin, pains in the lower belly, occasional tenesmus, frequent costiveness, followed by spontaneous diarrhœa and discharges of blood, attended also with frequent prolapsus ani and difficult micturition.

In conducting the cure, very delicate management was requisite;—in fact the disease required rather to be led than driven. A strictly-regulated diet, and the use of flannel next the skin, were of the highest consequence. At the same time the patient was put under a gentle and gradual course

of calomel, taking three or four grains morning and evening, and rubbing in a portion of mercurial ointment on the belly and right side. Laxatives and astringents were employed occasionally, but, above all, the greatest use was made of opium both internally, and locally per anum, and it really effected most conspicuous benefit. Sulphate of zinc I now and then tried; but from the nausea which it excited, even in three grain pills morning and evening, and from its apparent inefficacy in the disease, I should scarcely, in future, be tempted to give it farther trials. The tonic power of Peruvian bark was very useful both as an astringent to the bowels, and as a restorative to the whole system. When the mouth was recovered from the first gentle course of mercury, if the complaint had not yielded, I did not hesitate to use calomel again and again in the same gradual manner, till the gums were repeatedly somewhat affected, and then gave tonics as before. This assiduous perseverance, and the patient attention which it implied, I am happy to say, were well rewarded—many patients were thus recovered from a state—not hopeless indeed—but very precarious, and were re-established in firm health.

It is worthy of remark that relapses in this disease are, more than in any other I know, peculiarly frequent and fatal.—Most of the deaths occurred in relapsed cases. In one instance a patient relapsed thrice, and the third was more untractable than the preceding; in him a large abscess sprang up in the epigastric region towards the close of the disease, and burst—discharging profusely bloody and bilious sordes, evincing that the abscess had its radicle in the liver, as dissection afterwards more clearly proved. In two or three instances, the belly, during convalescence, became tumid and tense—and remained thus for a considerable time after their recovery from dysentery. This tumefaction the patients attributed to the state of their liver, and believed themselves to be "Liver-grown," as they expressed it; but from the spontaneous and often sudden disappearance of this peculiar symptom, I am rather induced to ascribe the distention to the secretion and extrication of flatus, from the weakened villous coat of the intestines, and from its accumulation in their convo utions and in the cells of the colon.

I never had any reason to suspect this disease, or the pyrexia which ushered it in, and attended it, to be in any measure contagious; inasmuch as it did not appear indiscriminately, or spread from man to man by communication; but

was entirely confined, both primarily and ultimately, to that portion of the crew whom duty led on shore, or who were employed in boats on the river *Apalachicola*. Every boat's crew that returned from such service was sure to bring a reinforcement to the sick-list; and out of six new patients thus added, three would be found labouring under ardent fever—(for the weather was by this time hot), and the remaining three under dysentery of the above-described type. From this fact, repeatedly and constantly observed, I am induced to draw the conclusion that both these complaints are excited by one and the same special miasma; for, of a given number of men taken ill in consequence of exposure to the predisposing and exciting causes, it seemed as uncertain as the toss-up of a half-penny whether the one or the other of these diseases would develope itself in an individual or individuals so exposed. This, however, I advance rather as an opinion countenanced by facts, than as being in itself a fact; for I am well aware of the weight of authority that is against me on this point, and must confess that my means of observation have not been sufficiently extensive to warrant a *positive* induction.

I before mentioned that besides dysentery, many cases of intermittent fever and scurvy occurred; but on these I need not detain the reader with any remarks. Here, therefore, the detail of this season of peril and pressure closes.—It commenced about the middle of January, and its painful duration was upwards of two months. During the last week of March and first week of April, the main part of the expedition finally left those shores; therefore, the observations I am about to offer on fever, apply less to the armament in general, than to the force (chiefly naval) that was obliged to remain in the Gulf of Mexico for several weeks after the rest had proceeded home.

The frosts and cold rains which had lately prevailed on this coast were now at an end, and the temperature mounted rapidly to the average standard of the torrid zone. During April and May, the thermometer was seldom below 80, and often, indeed, rose much higher. This greatly-augmented temperature soon began to tell on the people, and gave rise to many cases of cholera, and of ardent fever,—the latter entirely confined to those who had been serving on shore and

exposed to the sun, night-dews, and miasmata, or been pulling in boats on the coast or in the rivers. I have already remarked that of the men so circumstanced some were affected with fever and others with dysentery, according as accidental causes, or peculiar idiosyncrasies of the patients' constitutions happened to determine. Of cholera, not one instance, so far as I am aware, proved fatal; large doses of calomel and opium, and plenty of mild diluents, constituted the whole of the treatment. In ardent fever, however, the success though great, was by no means so uniform. I here propose to throw together a few desultory remarks on this much-agitated disease; to treat of it circumstantially, even were the limits of this communication to admit such detail, would, after the excellent works, and smaller though very able monagraphs lately published on the subject by Dr. Bancroft, Dr. Dickson, Dr. Fergusson, and others, be entirely a piece of supererogatory labour.

In the Gulf of Mexico, the features of this fever were precisely such as I have been accustomed to see in the Causus or yellow fever, so well known in other parts of this great western archipelago. It had the same premonitory and leading symptoms, the same proneness to excessive arterial action, irregular local determinations, and topical congestions of blood in the contents of some of the great cavities, with the same rapid and decided tendency to death. It was, indeed, a most formidable disease, and verified all that has been written about its danger. In the milder cases, one in five or six is about the proportion of deaths, but, in the highest grades, if one half survive it may be considered success.

From my rating the proportion of deaths so high, let it not be inferred that I am unacquainted with the published accounts of unusual success in treating this disease, which have from time to time been offered to the medical public. We have all read of a great number of cases of this fever being cured by the cold affusion, and of a still greater number being treated by blood-letting and purgatives, with few or no deaths whatever. But little does he know of the disease who shall ascribe this high success to superiority in the plan of cure; because it has been found, over and over again, that the very same remedies in the hands of practitioners, of talents not inferior to these fortunate individuals, have been followed by results by no means so felicitous. I am quite certain that every discerning reader will draw the conclusion —and it is a conclusion which must gladden the philanthro-

pist—that in the West Indies the epidemic of each year is not alike in severity, but that, on the contrary, in the very empire of that fatal disease, which is continually spreading mourning over almost every family in Europe who happen to have cherished relatives in that insalubrious clime, there often prevails a fever which is neither untractable nor destructive; and that *its* diminished intensity sufficiently accounts for the diminished mortality.

Modern medicine has nothing of which it can boast with greater justice, than the improvement of late years introduced into the treatment of this disease;—an improvement which has apparently given more enlarged views of febrile diseases in general, and communicated an analogical boldness to the treatment even of European fevers, which it never had before. The contrast *abroad* betwixt the present and "the older time" is sufficiently striking. The imaginations of professional men in tropical climates, were formerly subdued, and their exertions over-awed by the scholastic doctrines of "debility." Systems of nosology had been pleased to style the disease in question "typhus Icterodes,"—consequently, active depletion was carefully shunned. The practitioners stood comparatively idle during the early stage, cogitating about the "vis medicatrix naturæ," and cautiously prescribing his febrifuges, his James's powder, and his calomel. The disease, of course, *took its hue* from the species of treatment employed at first. The neglect of evacuations allowed the excitement to riot and revel unchecked;—*hence* came petechiæ, vibices, hæmorrhages, and the rest of the direful consequences of over-action; *then*, indeed, the disease was pronounced "malignant," "pestilential," and highly "putrescent,"—and the golden opportunity arrived for throwing in (as the phrase is) his bark, wine, and opium, against that debility about which at a wrong time, he was over-solicitous.

That cabalistical word *typhus*, I verily believe, has slain its thousands and its tens of thousands, from the erroneous hypotheses which are indissolubly associated with its very sound. Every body is now convinced how improperly the term is affixed as a cognomen to the endemic fever of the West Indies;—that it is applied with more propriety to the majority of fevers in *our own country*, is to me by no means clear. While I acknowledge that in the *made-up* constitutions of artificial life,—amidst the squalid dregs of the population of a crowded and high-viced metropolis—some cases of fever occur where the brain labours merely through sympathy with

the stomach and other chylopoietic organs, and where the lancet, for several reasons, is unnecessary or inadmissible,—still, in by far the greater part, I suspect the re-action is sufficiently violent, and the determination to the contents of the head and belly sufficiently marked, to require, and to be greatly benefitted by, blood-letting either general or topical or both. The fever, however, is apt to be hastily pronounced typhus, and, this name once given to it, inert treatment is the usual consequence; for, in the minds of most practitioners (as Dr. Armstrong has well remarked in his incomparable work on Febrile Diseases,) "the word typhus is still too generally coupled with the opinion that the fever which it properly designates, is in all its stages a disease of real debility; though this notion has either been taken on the word of those authorities who for a time gave the tone to medical opinions and theories,—or been impressed upon the minds of those who entertain it, from a contemplation of the disorder wholly limited to its advanced periods." To be sure, in the fevers of our climate, the morbid actions are fortunately seldom so concentrated as to resist the subordinate evacuations of purging and blistering; consequently, even under the disadvantages of inadequate treatment, the mortality is not so great as in diseases of a similar character in the western world, where every thing seems to have been fashioned by a bolder and more abrupt hand, and where the phenomena of disease, like the phenomena of external nature, are upon a larger, grander and more majestic scale. Yet, I am convinced, were active evacuations more freely resorted to at the onset of our domestic fevers, not only the number of deaths would be diminished by the practice, but the sickening spectacle of a lingering convalescence, where the shattered powers of the system can scarcely rally themselves even with all the appliances of permanent and diffusible stimuli, be in a great measure avoided. But I despair of seeing more liberal ideas and more efficient practice obtain on this point, while the pernicious maxim of Dr. Fordyce—(pernicious from being misunderstood and misapplied)—"Bonus medicus nunquam sanguinis humani prodigus"—is vauntingly professed by many otherwise well-informed members of our profession.

The same erroneous nomenclature which gave to ardent fever a typhoid type, in all likelihood had a great share originally in producing the notion of its being contagious, a notion which has since excited as memorable a controversy as any on the records of medicine. But the public must already be

tired of the dispute, and therefore I shall not enter into it. Indeed it is quite unnecessary, as Dr. Bancroft's triumphant "Sequel" lately published, may be considered as having set the question at rest for ever.

I shall simply state, that from my own comparatively limited experience, I have never seen aught to countenance a suspicion of contagion; but, that on the contrary I believe the disease to be strictly endemical or indigenous to tropical countries, or to such countries without the tropics* as have a temperature, at certain seasons, from 80 to 90, and to be owing to the diffusion in the atmosphere of those poisonous exhalations which are elicited by the rays of a powerful sun, from marshes—from putrefying vegetable matters, or from the *soil itself* of hot countries. Miasmal poison is one of the most widely diffused causes of disease throughout the whole province of nature; and if northern climates know less of its pernicious effects,—they owe this happy exemption solely to the inferior power of the sun's heat in collecting those noxious vapours.

The endemic of the West Indies is, in my opinion, justly classed in the order of intermittents, which are universally believed to be of local origin and non-infectious. On this point however, I would be understood to speak with diffidence, as I am aware there is highly respectable authority against me.

In this fever, I look upon either the brain, or the stomach and contiguous abdominal viscera as being always the chief seat of disease: for it is on one or other of these organs that the attack first manifests itself, and it is by disorganization in one or other of them that the malady kills. It is not unworthy of remark, that during the summer months, when the weather is hot and dry, I found the cerebral,—and in the autumnal months, when the season is still hot, but rainy,—the gastric affection, most prominent in the primary stage of ardent fever.

I have never been able to see the propriety of the distinction which authors have drawn betwixt the different gradations of West-India fever. Of this, as of all other diseases,

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* Thus in March and April 1815, New Orleans was visited by a violent *four or five-day* fever which carried off some of the inhabitants, and many strangers. This was merely the usual summer marsh-fever, endemical to the town and neighbourhood, brought on in the present instance, earlier than usual, from the sudden ascent of the thermometer, after the preceding severe season. The previous siege, and unusual influx of strangers, of course, greatly augmented the predisposition to the disease.

every case is not alike severe; yet the most violent they are pleased to denominate *yellow fever*, while those of a milder form are called by the name of bilious remittent. This appears to me a distinction without a generic difference, for these two forms have certainly the same inflammatory character,—the same morbid actions—the same tendency to local congestions of blood; and are merely varieties of the same disease,—produced by the same diffusible poison,—obeying the same laws,—only modified by accidental circumstances of predisposition in the habit of the patient, or the strength of the dose of miasmal gas. It would introduce endless confusion into our nosological systems, were the ever varying gradations of severity in any given disease assumed as a sufficient ground for referring it to a new cause or a new class.

I shall here describe a most fatal variety of this fever,—a variety which well deserves to be accurately pourtrayed.—The disease comes on in the usual manner; but from the very beginning, and throughout, the nervous system is the chief seat of attack, and appears to suffer dreadfully. Its susceptibility seems to be greatly increased, while, at the same time, its energy is as greatly diminished; hence it is excited into a degree of diseased mobility by impalpable or incognizable stimuli which are usually inadequate to produce impressions, and loses in a great measure, its healthy influence or controul over the motions, functions, and sensations of particular parts. The patient looks half intoxicated,—he staggers—he pants for breath,—his voice is shrill and tremulous, and his whole appearance betokens agitation inutterable, with a dash of wildness gleaming at intervals over his anguished features, which add unspeakably to the horrors of this death-bed spectacle. He complains of little or no head-ache, but appears impatient and irritable—yet oppressed; and, after the first day, sinks down in bed with a hopeless or careless expression of resignation. The external senses seem torpid, or are occupied exclusively with ideal perceptions,—insomuch that he neither sees nor hears what is going on around him without a special effort to look or listen; and even then, he is not unfrequently subject to visual or acoustic illusions.

The empire of the will seems to be overthrown, for there is a singular prostration of the voluntary powers, and such tremors of the extremities that the patient is unable to lift a cup of liquid to his mouth, and, when raised out of bed, cannot stand erect even for a moment. Under such circum-

stances, if the cold affusion is administered, the shock induced by it is too much for the morbid nervous susceptibility, and increases the tremors to so fearful a degree, that I have more than once been terrified lest they should end in general convulsions, and have been glad hastily to desist from its use, and to substitute sponging with vinegar and water in its stead.

The organic or involuntary functions are not less disturbed. The stomach is *from the very first*, highly irritable, and so continues. There is also a more than usual burthen about the præcordia, and such a catching in the respiration as caused me to notice dyspnœa as one of the *earliest*, as well as one of the worst, symptoms. The heat of the surface is very great, with partial sweats here and there: the pulse, too, is very frequent (from 130 to 140,) but easily compressible, and, moreover, undulating. I do not know a more accurate term than this last to denote the nature of the arterial stroke; for it exactly seems as if each unda of blood followed *instantly* on the preceding one, without an intermediate efficient systole or diastole of the heart.—When the patient is raised in bed, or when even an inconsiderable quantity of blood is drawn (in the recumbent posture), the pulse becomes fluttering and innumerable, and vomiting, with syncope, supervenes. Such is the picture of the patient's state from the first hours of indisposition till the third day of the disease:—towards the end of that day, subsultus, coma, and cold extremities occur, and death takes place early on the fourth.

Whenever I have met with this variety, it has proved fatal:—this will scarcely be wondered at, when we view the mixed inflammatory and congestive character of the disease; and when we recollect that bloodletting and cold affusion (our two most potent remedies,) are inapplicable in it,—or (which is saying the same thing), can only be very partially and inadequately employed. The peculiarity of this variety consists in the absence of head-ache, and the pressure of dyspnœa and gastric irritability, from the earliest to the latest hour. The vast commotion of the nervous system, too, and unusual state of the pulse, strongly arrested my attention. I was, therefore, very anxious to see if dissection would throw any light on the symptoms.

On examining the stomach I found the vessels on its inner coat much more conspicuous than natural, and filled with dark grumous blood; but without any distinct traces of acute inflammation. In the lungs and other viscera of the thorax

and abdomen, there were no appearances of inflammation whatever, and none of congestion, save such as might readily be accounted for by venous gravitation.

In the brain or its membranes I found few traces of undue vascular action save in its basilar portion. *Here* the pia mater was very red, and adhered pretty firmly to the substance of the brain,—and patches of coagulable lymph were thrown out at various points, gluing together the inferior convolutions. The tractus optici were loaded with dark-coloured and apparently infarcted blood-vessels, as were the other cerebral nerves, from the points where they emerge from the substance of the cerebrum, pons, and medulla oblongata, to their exit by the cranial foramina. A table-spoonful of fluid was found in each of the lateral ventricles.

But it was in the cerebellum and medulla oblongata that the chief morbid appearances were detected: the former shewed a degree of vascularity indicative of high previous inflammation,—anteriorly and inferiorly it was covered with a plexus of distended vessels: and the latter, together with the pons varolii and medulla oblongata, was enveloped by tenacious thready layers of fibrin which could scarcely be removed without injury to the medullary substance underneath. About two tea-spoonfuls of serum also were found effused in the fourth ventricle; and the whole of the nerves arising from the medulla oblongata, but especially the par vagum, were found of a purplish colour, evidently from the ramification of minute congested vessels. All the veins and sinuses of the encephalon were greatly distended with blood.*

Having found these appearances in only two cases, it may appear hasty to attempt any thing like an induction from them, yet, wishing to draw the attention of future observers to this matter, I am inclined to hazard an opinion—speculative certainly, yet not altogether improbable,—that the type and the relative danger of this fever are regulated by that portion of the center of the nervous system which shall happen to be the chief seat of inflammatory determination and sanguineous congestion. Conformably to this view, it might with some shew of reason, be inferred that the danger is less when the anterior and superior lobes are chiefly affected,

* I am very sorry that at the time when these cases occurred, I was unacquainted with the interesting researches of Dr. Sanders of Edinburgh, into the state of the spinal marrow and theca vertebralis, in general fever; and with the views which he so ably expounds. I now regret in vain the opportunities that then escaped me of investigating this important pathological point.

(though the disturbance of the sensorium may be greater;)—but that the danger is imminent, and death scarcely avoidable, when the base of the brain, the origin of the nerves of automatic life, and the medulla oblongata, are implicated in inflammation.

How far the appearances on dissection account for the preceding symptoms, is a question which cannot be satisfactorily answered in the present state of our knowledge of pathological physiology: but perhaps it would not be refining too much to suggest that the morbid vascularity of the eighth pair of nerves (which, with the great sympathetic, supply the lungs, heart, and stomach),—the inflammation of the medulla oblongata, and the compression, too, of this important part from the effused serum, caused that imperfect operation of volition on the parts subject to the will,—that early and permanent debility of the vital functions, that dyspnœa, fluttering pulse and vomiting, which characterised the cases from the first moment of attack.* If I mistake not, Galen has somewhere asserted that inflammation of the cerebellum is always accompanied with an undulating pulse:—it was, I believe, this hint, casually stumbled upon, that first led me to examine this and the contiguous portion of the brain with more than ordinary care.

Whatever may be thought of the above opinions, I am satisfied of the accuracy of the fact that early dyspnœa, and an undulating pulse—viewed merely as pathognomonic signs—always indicate extreme danger in this disease; indeed when the more ordinary forms of the complaint prove fatal, these symptoms always precede the unhappy event.

Of the general treatment of the endemic fever I come now to speak. Regarding this disease to be, to all practical intents and purposes, inflammatory, and the affection of the head to

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* These speculations derive a singular degree of countenance from the results (since detailed to me by my friend *Mr. Hastings*, one of the Presidents of the Royal Medical Society of Edinburgh), which have been observed to follow the dividing of the eighth pair of nerves, in the lower animals.—This gentleman,—no less distinguished for his talents than for his zealous and unwearied prosecution of physiological experiment,—has found that, on cutting the par vagum, the process of digestion is completely suspended, and such irritability of stomach induced, that the animal rejects by vomiting all sort of food or drink. The œsophagus soon becomes paralyzed, and deglutition is thenceforth impracticable.

The action of the heart, also, is greatly weakened and disturbed: and there is a remarkable dyspnœa, which soon increases to laborious breathing, and is followed by the effusion of bloody frothy serum into the air-cells of the lungs, before death. There are also observed reddish patches on the surface of the lungs.

be primary and essential, (which is evinced by head-ache, intolerantia lucis, and red eyes, occurring as the earliest symptoms, for the eye is here generally an index of the state of the brain, in the same manner as the tongue is of the state of the stomach,) I have never hesitated to push evacuations to the utmost. Bleeding from the arm, or frontal branch of the temporal artery was always my first step :—and large and repeated bloodletting during the early stage,—(the earlier the better)—I consider the great palladium of the patient's safety. During the first twelve hours of the disease I have generally drawn from 50 to 60 ounces ; but there can be no general rule as to how many ounces should be taken : we ought to bleed to syncope, and bleed repeatedly, in order to break the morbid association of the symptoms, and induce a speedy remission : for I am convinced that it is not only by its unloading the vessels, but by the *shock* (I cannot express it in philosophical language,) which it gives to the whole system, nervous as well as vascular, that bloodletting affords the magical relief I have so often witnessed. It is also chiefly by the inexplicable changes implied in the word *shock*, that cold affusion operates advantageously ; for in tropical climates where the temperature of sea-water is generally from 80 to 82, its refrigerating power must be much abated.

The state of the pulse is less to be regarded than the urgency of the other symptoms ; even when the former is thready, spreading, or undulating, the latter often imperiously demand renewed depletion ; and their demand must be complied with at all hazards. In a disease like this, where the danger is frequently imminent in twelve or twenty-four hours, it is often amazing how much its apparent character may be altered by active depletion. From a fever of the highest grade, management will change it to one of the second or third order. To secure every chance of such success, no attention must be spared ; the patient ought to be visited every two hours ; and, whenever the febrile symptoms get up anew, new exertions must forthwith be made to subdue them.

It is a Herculean disease, and, without that almost omnipotent remedy,—the lancet, we might be said to encounter it unarmed ; for all other means are but of secondary force. It requires all the vigour and activity imaginable, else it will gain ground on us with rapid strides. It is indispensable to bleed again and again : this is the main stay—the sheet-anchor of Hope. Without it many—very many—must infallibly be lost ; would that I could say that by it *all* are saved ! But

when it is recollected how often inflammation, even of parts not vital, foils all our exertions at resolution, it cannot be wondered at if bloodletting is often incompetent to remove inflammation of the brain or abdominal viscera,—organs endowed with high sensibility, extensive sympathy, and functions whose right performance is essential to life.

I cannot undertake to go minutely into all the happy results of this decisive practice;—it is sufficient to state the following:—Patients who have been ill of fever are apt afterwards to die of dysentery, or chronic complaints; though thirty-seven of the crew of H. M. S. Cydnus laboured under ardent fever previously on the Jamaica station, and though the ship afterwards suffered a good deal from dysentery in the Gulf of Mexico, none of the thirty survivors from the fevers died of the dysentery or of any other subsequent disease. It is therefore another praise of the depletory practice that it leaves no visceral obstructions to be a source of after-danger. There is a farther indirect advantage arising from this method of treatment: in the early stage of ardent fever there is often a torpor of the bowels, which renders them insensible to the stimulus of purgatives. When bleeding is practised largely, either while the blood flows, or immediately after recovery from syncope, the cathartic previously given produces urgent calls to the seat, and full evacuation. Moreover, venesection seems to me to render the body more susceptible of the action of blisters.

It is almost unnecessary to point out the advantages of this practice, as it now obtains so universally. I have felt by experience that it is a matter of great nicety in the treatment to say when active evacuations ought to be laid aside. The judicious decision of this point requires considerable *tact*, and a previous pretty extensive acquaintance with the varied and successive phenomena of the disease.

Purging—free purging—I have not hitherto mentioned, its necessity being so much a matter of course. A stimulus ought to be kept up constantly on the bowels, if with no other view than to relieve the head. Blisters and the cold affusion I have found to be valuable auxiliary remedies: I call the latter by the subordinate epithet of *auxiliary*: for to attempt, as some have fondly hoped, to extinguish this most violent fever by *it*, is, (hyperbolically speaking), like attempting to extinguish the crater of Mount Ætna by water. It, however, reduces heat and invites sleep, and—what is of very great consequence,—by its bracing power on the skin, it gives

tone to the stomach, lessening nausea, and checking vomiting, a thing so much to be dreaded in every stage of this disease. With the latter view, also, I have found small oft-repeated doses of calomel, and saline effervescing draughts, highly useful. These last I have generally prepared with the carbonate of magnesia instead of the carbonate of potass, using always the lime juice somewhat in excess. The supercitrate of magnesia thus formed seems to possess both refrigerant and purgative virtues superior to those of the citrate of potass.

These remedies are mentioned in succession according to their relative efficiency ; but, in actual practice, their application must be contemporaneous. Bleeding, purging, shaving the scalp, cold lotions to the head, and general refrigeration by the cold bath, must be drawn up together in array against the disease, and must make a combined attack. A first, a second, or even a third disappointment must not rob us of our perseverance. Courage and constancy will, in the end, often succeed against great seeming odds. In short, the violent excitement must be got under by all means, ordinary and extraordinary.

I have never trusted to calomel as a *sialagogue* in this disease to the exclusion of depletion. The confidence in the specific powers of that medicine has, I believe, now faded away before the better lights and the more speedy results which the latter practice has afforded. The exclusive exhibition of calomel may therefore, be considered to have been dropped, from a tacit conviction of its inadequacy. But, very recently, this mineral has been greatly extolled and recommended in conjunction with, and as subsidiary to venæsection, in the cure of ardent fever, by some whose talents and authority deservedly possess great weight with the profession, and who draw their conclusions as to the superior efficacy of this combination of the depletory and mercurial methods, from long *experience* in the Eastern world. While I pay merited deference to experience so much ampler than my own, I must beg leave to say that my habits of thinking do not permit me to care much what is the secondary treatment of fever, provided its primary treatment be conducted on a plan becomingly rational and energetic. As the issue of the disease hinges so much on the method of cure pursued during the first stage, it is on *that* that I am disposed to lay the greatest stress ; and I think I am borne out by facts in the assertion that if evacuations have been rigourously employed, and duly persisted in, at the onset of the fever, visceral con-

gestions or other organic lesions of any sort, will be very rare occurrences, inasmuch as they will, for the most part, be checked in their nascent state. Nay,—I have often been tempted to think that convalescence went on more rapidly when nothing was given as medicine save an occasional purgative; at first, I was in the habit of giving the bark as soon as a fair remission of the febrile symptoms had taken place; but I was soon convinced that the recovery is more favourable when the stomach is unclogged by this or other tonic drugs. In no case is the "nimia cura medici" apt to do more harm than in the convalescence from fever. If we keep the patient's bowels open, and, (without regard to his importunities to the contrary,) retain him for a few days longer on *low diet*, nature will generally do the rest.

No doubt, I have seen cases where, after the subsidence of fever, the tongue continued loaded, the appetite returned not, and there was a sense of fullness under the right ribs. This I attributed to hepatic congestion and torpid secretion: and found a course of calomel pushed to salivation, succeed remarkably well in its removal.

To the patients under my care, I have been in the habit of giving three or four grains of calomel after the primary stage of fever, every three or four hours, with a view of deriving from the head and viscera, by keeping up a constant action on the intestinal canal,—as also to carry off bilious and other sordes, and to prevent vomiting. I preferred calomel; because, from the precarious state of the stomach, more bulky or more nauseous cathartics could not, in all likelihood, be retained.—When low delirium, coma, torpor, or the like, occurred, I have now and then, as a last resource, placed the system under the influence of mercury; but even under these circumstances (though the mouth was fairly affected) I have never been so fortunate as to see it of any avail in saving life.

This medicine is also said to possess the prophylactic virtue of warding off an attack of fever. No one will deny that a mercurial course, by lowering the tone of the constitution, lessens the liability to this as well as to all other inflammatory diseases; but whether it possess any *specific* anti-febrile power, is a matter of doubt. I have met with some cases certainly not countenancing the existence of such a power; but my experience has not been sufficient to justify a positive opinion on so important a matter: I therefore leave the subject open to future observation.

The eruption on the skin of prickly-heat (*lichen tropicus* of Willan and Bateman), by some has been regarded as a preventative of ardent fever. But I am sure, from experience, that this is a mere popular error.

It would be easy to extend these remarks on fever to a greater length; but I have confined myself to leading points, and to those opinions of late authors which seemed to admit of farther disquisition. Imperfect as this paper is both in point of matter and composition, I am not without hopes that the facts and dissections will be thought of some value, and be duly pondered by the profession. It is only by a candid statement of failure as well as of success, that medicine, which is not (as it has been called) "a conjectural art," but an experimental science, can hope to gain ground—if not rapidly—at least securely. In this point of view, a delineation of disease on a great scale, and a detail of practical facts, can never be wholly useless:—it is only for me to say, in conclusion, that on the various important matters touched on in this paper, I have done my utmost to observe diligently, and report faithfully.

ARCHIBALD ROBERTSON.

March 1818.

FINIS.

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