

SANITARY COMMISSION.

P.

REPORT

OF A

COMMITTEE OF THE ASSOCIATE MEMBERS OF THE SANITARY
COMMISSION,

ON THE SUBJECT OF THE

NATURE AND TREATMENT

OF

MIASMATIC FEVERS.



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THE attention of the Sanitary Commission has been directed to the fact, that most of our Army Surgeons, now in the field, are unavoidably deprived of many facilities they have heretofore enjoyed for the consultation of standard medical authorities. It is obviously impossible to place within their reach anything that can be termed a medical library. The only remedy seems to be the preparation and distribution among the medical staff, of a series of brief essays or hand-books, embodying in a condensed form the conclusions of the highest medical authorities in regard to those medical and surgical questions which are likely to present themselves to surgeons in the field, on the largest scale, and which are, therefore, of chief practical importance.

The Commission has assigned the duty of preparing papers on several subjects of this nature, to certain of its associate members, in our principal cities, belonging to the medical profession, whose names are the best evidence of their fitness for their duty.

The following paper on "The Nature and Treatment of Miasmatic Fevers," belongs to this series, and is respectfully recommended by the Commission to the medical officers of our army now in the field.

FRED. LAW OLMSTED,

Secretary.

WASHINGTON, May 25th, 1862.

REPORT.

DISEASES of malarious origin, especially febrile affections due to this source, are of such importance to the army surgeon that the Sanitary Commission have judged it proper to devote a few pages to their consideration.

Of the intimate nature of the "paludal poison," "marsh miasmata," or "malaria," we are in complete ignorance. Of the hypotheses thus far advanced, the most plausible are those which refer the morbid influence to the sporules of cryptogamic plants or to the infinitesimal ova of infusoria. Nevertheless, these are mere theories, unsupported by demonstration addressed to the eye, through the medium of the most perfect microscopes; nor have partisans of the atmospheric or gaseous hypothesis been more successful in attempting to show, by eudiometry, the existence of any peculiar matter in the air of infected places.

This confession of ignorance still leaves us in possession of certain knowledge concerning malaria, from which much practical good may be derived.

1st. It affects, by preference, low and moist localities.

2d. It is almost never developed at a lower temperature than 60° Fahrenheit.

3d. Its evolution or active agency is checked by a temperature of 32°.

4th. It is most abundant and most virulent, as we approach the equator and the sea-coast.

5th. It has an affinity for dense foliage, which has the power of accumulating it, when lying in the course of winds blowing from malarious localities.

6th. Forests, or even woods, have the power of obstructing and preventing its transmission, under these circumstances.

7th. By atmospheric currents, it is capable of being transported to considerable distances—probably as far as five miles.

8th. It may be developed, in previously healthy places, by turning up the soil; as in making excavations for foundations of houses, tracks for railroads, and beds for canals.

9th. In certain cases, it seems to be attracted and absorbed by bodies of water lying in the course of such winds as waft it from the miasmatic source.

10th. Experience alone can enable us to decide as to the presence or absence of malaria, in any given locality.

11th. In proportion as countries, previously malarious, are cleared up and thickly settled, periodical fevers disappear. In many instances, to be replaced by the typhoid or typhus.

11th. We possess, in our materia medica, an antidote to the malarious poison, as well as a prophylactic against it.

13th. The propinquity of large fires will often prevent the injurious effects of malaria.

Inasmuch as the fevers due to miasmatic influence are identical in nature, it has been thought well to give brief descriptions of the different varieties, reserving the treatment for subsequent consideration, when the special therapeutics of each will be mentioned.

These varieties, mutually convertible, one into the other, are known as the *intermittent*, the *remittent*, and a third, partaking generally of the first, but occasionally of the second, and best known, in the United States, as the *congestive*.

Of the intermittent fevers, known in this country as “ague,” “fever and ague,” “chills and fever,”—characterized by an entire cessation of febrile phenomena, during a certain time, we have several types:

1st. The *quotidian*, occurring once in every twenty-four hours, and commencing about the same time of day.

2d. The *tertian*, occurring once every other day, with a

tendency to observe the same rule, with regard to time of commencement.

3d. The *double tertian*, in which there is a morning paroxysm on one day, and an evening paroxysm on the day following—the alternate days exhibiting, in general, fevers of similar characters.

4th. The *quartan*, occurring every third day, at or about the same hour.

5th. Other irregular types, as the *quintan*, *sextan*, *heptan*, etc., are to be looked upon as medical curiosities—so rarely are they met with. The frequency of occurrence of these types is in the order named above.

An attack of intermittent fever may have prodromata, common to the other varieties, or it may be sudden. When these prodromata occur, they are usually found to consist of furred tongue, loss of appetite, headache or other neuralgic pains, or that well understood condition of *malaise*, in which the patient may only complain of “not feeling well.”

When the disease is well developed, we recognise

The cold stage, ushered in generally by a chill, sometimes amounting to a mere sense of coolness—sometimes to a violent rigor. The features are shrunken and anxious; the skin cold to the touch and shrivelled; the nose, ears, lips, fingers, and toes are bluish. The patients instinctively seek the warmest spot attainable. The breathing is oppressed, sighing or yawning. To the thermometer the skin may show a diminished temperature or may be normal in this respect, even whilst the patient complains of feeling cold.

Anorexia, nausea, or vomiting are often present. Usually the bowels are constipated, the urine is abundant and limpid.

Pains in the limbs, head, and back, are frequent. The pulse is commonly quickened and small.

The cold stage may last for a few minutes or for several hours. As it subsides, the sense of chilliness ceases to be felt, the patient throws off the clothes, thirst becomes urgent, the

pulse increases in frequency and force, whilst the quickened respiration is normal in rhythm. The headache becomes more severe, as do the other neuralgic pains; the tongue is furred—anorexia continues; so may nausea and vomiting with constipation of the bowels.

The thermometer shows an increased heat of the body, above the normal standard. The secretions are diminished, including that of the urine, which is high colored, and frequently yields deposits of urates, on cooling. In many individuals, delirium is a striking symptom. In others, a strong disposition to sopor or coma is observed.

After a variable duration, the febrile symptoms described diminish in intensity, and, finally, disappear—sometimes suddenly, at others, gradually, the body becoming cooler, and covered with a more or less copious perspiration. It is through this third or *sweating stage*, that the *intermission* is reached. During this, the patient may complain severely of malaise and debility, or he may be altogether unconscious of any ailment.

Many variations from the description above given may be met with. There may be no perceptible chill, the paroxysm seeming to commence with the hot stage. There may be no fever, and no sweating, the chilly sensations only being those recognised; or, lastly, there may be a periodical sweat, without chill or fever. Indeed, any well marked periodical pathological phenomena, not known as hectic, occurring in malarious regions, are by some practically regarded as belonging to the disease under description; since the same agency gives rise to them, and to the same remedy must we look for cure.

The period elapsing between the termination of a paroxysm, and the commencement of that which succeeds, is called the *intermission*.

The diagnosis of this disease, consideration being given to the place and circumstances in which it occurs, is not generally attended with difficulty, after observation of one paroxysm.

With reference to the etiology, there are several points of interest.

1st. The disease is very little apt to commence at night.

2d. From the middle of summer to the beginning of winter, is the season, during which it is most prevalent in the United States.

3d. It is not possible to predict the amount of malarious fever that will ensue, from any given conditions of heat, moisture, atmospheric or telluric phenomena.

4th. In the more temperate regions, the intermittent type predominates. As we approach the equator, there is more tendency in the fever to become remittent or congestive.

5th. From Forry's tables, we infer that the relative prevalence of the disease, in different sections of the United States, is as follows, viz.:

On the northern lakes, 193.

Posts north of 39° north latitude, at a distance from the sea and great lakes, 151.

Sea coast stations from Delaware capes to Savannah, 370.

In the south-west, including Jefferson barracks, Forts Gibson, Smith, Coffee, Towson, and Jesup, 747.

On the Lower Mississippi, 385.

In East Florida, 520.

6th. It is an incontestable fact that negroes are more exempt than whites from all miasmatic ailments. It is believed that in mulattoes, the liability to suffer is regulated by the amount of Caucasian blood, in the individual concerned.

7th. The poison of fever may remain in the system very various times after exposure to malaria. In some instances, a few days only will elapse, before the disease declares itself; in others, an interval of four or five months—perhaps longer—may pass over, before the manifestation of symptoms.

8th. There is a certain protective power against the influence in question, by what is known as *seasoning* or *acclimation*: in other words, by previous residence in the infected locality.

9th. Among exciting causes, we recognise, exposure to the out-door air, between sunset and sunrise; long continued exposure to direct insolation, at high temperature; exposure to cold, whilst the body is warm, and the skin active; fatigue; excessive indulgence of any kind, especially in intoxicating beverages.

10th. Of all diseases known, intermittent fever is, more than any other, apt to be characterized by a tendency to repeat itself many times, in the same subject. After having been once cured, there is a powerful disposition to recur on the seventh day, or on some day represented by a multiple of seven—dating from the last paroxysm.

11th. The disease has a natural tendency, when undisturbed by treatment, to terminate at very uncertain periods—sometimes lasting only a week, at others, four or five months.

All kinds of malarious fever have a tendency, when long continued, to produce certain lesions of innervation and visceral disease, especially of the liver and spleen, and to interfere with the function of hæmatisis. From derangements of the latter, with the accompanying debility and hydræmia, it is not uncommon to find dropsical affections of the lower extremities. In the experience of New York hospitals, the worst forms of this malarious cachexia have been found in convalescents from what is known as Panama fever. In those, it was very common to find obstinate diarrhœa or dysentery, as complications.

In simple intermittent fever, we can always make a favorable prognosis. In many instances, remittent fever is tractable and unattended by danger to life, whilst certain epidemics may show a very large per centage of fatal cases.

The congestive is the most to be dreaded, the mortality being nearly always, very large. "Without treatment, or with the usual treatment of bilious fever, which is little better than none, in this disease, probably three-fourths of the cases terminated fatally. But with a special treatment, not more than one in eight." (Parry.) In Maillot's cases, the mortality was 393 out of 1211, a little less than one in three.

Before proceeding to speak of the therapeutics of miasmatic fever, it may, for the sake of brevity, be well to glance at the differences between the intermittent and the two other types mentioned. In the remittent form,* the difference may not and probably would not be recognised by the physician, until the time should have arrived for the occurrence of the sweating stage. This may appear imperfectly or copiously; but instead of the relief which the patient should experience during the intermission, there is only a *diminution* of the unpleasant symptoms. The pulse continues to beat rapidly, the headache and other neuralgic pains remain—usually with diminished intensity—the thirst, anorexia, and malaise are still complained of; and in the course of a short time, the phenomena of the hot stage are reproduced, sometimes with, sometimes without the preceding chill. Once or twice in the twenty-four hours—morning and evening—there occurs this temporary amelioration of symptoms (*remission*), followed by a reappearance of the febrile phenomena (*exacerbations*). The type may be quotidian, tertian, or double tertian—more frequently the first or third than the second. In some cases, so slight is the remission, that the form may be regarded as *continued*.

Should there be chills ushering in the exacerbations, the former are apt to be less marked, at the end of each remission, until they, finally, disappear.

From the long continued congestion of the stomach, probably, there is more apt to be severe nausea, vomiting, or epigastric pain and tenderness, than in intermittent fever. We may say the same of all the symptoms which have been described as belonging to the exacerbation.

Remittent fever may terminate spontaneously, in the course of two weeks, or it may last for thirty or forty days. On an average, we may expect convalescence at the end of a fortnight,

* Synonyms—Bilious Fever, Bilious Remittent, Lake Fever, Country Fever, Walcheren and African Fevers.

under favorable circumstances. With appropriate treatment, its duration is much abridged.

The rapidity and completeness of convalescence are inversely proportional to the danger of the disease. Relapses are easily induced by exposure to any of the exciting causes. Over indulgence of the appetite for food is especially to be avoided.

Little need be said in addition to what has already been remarked concerning the pathological anatomy of the disease. The bronzed liver, owing its color, as has been shown by Professor Alonzo Clark, to the existence of hæmatoidin diffused through the organ, and not to hæmorrhage into its substance, is the most uniform and characteristic phenomenon to be met with on post-mortem inspection. It is worthy of remark that this condition of the liver may exist for several years after recovery from the fever, and that it may occur from long residence in a miasmatic region, the patient never having suffered from remittent fever.

Another lesion, nearly always present, consists in the enlarged, softened, bluish-black spleen. This has been known to reach the enormous weight of eleven pounds. It is doubtless the result of chronic hyperæmia, as are most of the morbid appearances described by authors, met with in the brain and mucous membranes.

It has been said that congestive fever is the form most dreaded by patient and practitioner. This has been called *Algid fever*, *pernicious or malignant intermittent*, *pernicious remittent*. We shall preserve the name—sanctioned by long usage—by which it is known among American physicians.

In remittent fever, the tendency seems to a perpetuation of the hot stage. In the congestive, to a perpetuation of the cold.

Ordinarily, as has before been stated, it does not show itself as such, *ab initio*. We are able to recognise its existence, from observing that in the course of a common intermittent paroxysm the first stage, after lasting longer than usual, is not followed by the typical febrile symptoms. The face and extremities

become pale or livid, the countenance is expressive of anxiety which the patient does not feel, or it wears a shrunken and impassive look. The skin, covered with a cold clammy sweat, often resembles that with which we are familiar in Asiatic cholera, known as the "washerwoman's." Increased heat may be perceptible to the hand, over the chest and belly, whilst the extremities are very cold.

Complaint is made of epigastric tenderness and oppression. The stomach is often so irritable as to reject even small quantities of ice water, or of any fluid that may be swallowed. The matters vomited rarely contain bile. They are usually composed of fluids administered or of thin mucus, frequently mixed with blood. The thirst is one of the most striking symptoms. Dr. Parry mentions some of his patients exclaiming, "Oh, that I could lie in the river! Oh, if I could have a stream of cold water to flow through me!" and this, too, with the algid skin, the cold tongue, and the cool breath.

The bowels, sometimes quiet, are usually loose, the dejections, after the first few, becoming copious and not unlike those of cholera, mixed with blood. When the alvine dejections continue bilious, the prognosis is favorable.

Dyspnœa is, almost always, a prominent symptom. The respiration may be hurried, irregular, panting, or it may be performed by a succession of long-drawn sighs. With this difficulty of breathing is associated, as the rule, a small, weak, and frequent pulse.

A constant sense of restlessness, uneasiness, or jactitation, indicates the state of innervation. Oftentimes, the patient, when nearly moribund, will insist on getting up from the bed and walking about the room. As in cholera, there is marked apathy as to the course and result of the disease. Cramps in the extremities are frequently observed. In some cases of congestive fever, the above mentioned symptoms may continue, without any change, except in augmented intensity, when the patient is apt to die either by coma, by syncope, or by asthenia,

within seventy-two hours of the initial chill. When the progress is more favorable, a certain amount of febrile reaction occurs, very disproportionate in amount to the chill. The body generally becomes warmer, and a sort of intermission results. Discomfort and epigastric uneasiness are, however, very prone to remain. On the day following, or on the second day, there may be a repetition of these phenomena—in cases terminating favorably and spontaneously—the algid phenomena becoming less marked, and the pyrexia more developed, until the paroxysms assume the character of ordinary intermittent.

Unfortunately, this is not the usual history. With each accession of congestive chill, the lesions of innervation and the consequences of local hyperæmia become more serious, until the third paroxysm, beyond which life is not apt to be protracted, if the disease have been allowed to run an unobstructed course.

Inasmuch as the disease is so often amenable to therapeutical influence, and in view of the great danger to the patient that arises from want of immediate treatment, the diagnosis of congestive fever becomes of great importance. Many fatal cases can be traced to want of early recognition of its true nature. We should always suspect its advent, when in paroxysms of the other malarious pyrexiaë we observe “*an unusual paleness or lividness of the face; an absence of rigors or a sense of chilliness, while the extremities are really cold; a want of uniform heat after reaction; a disposition to copious or frequent vomiting or purging, with a sense of unusual weight or oppression at the epigastrium; an extraordinary frequency, feebleness, or irregularity of the pulse; much anxiety of countenance, restlessness, or jaetitation, or disposition to faintness; considerable delirium or drowsiness; a prolongation of the cold stage, and a less degree of febrile excitement than might have been anticipated; a continuance in the apyrexia of some mental confusion, sleepiness, faintness, or unusual anxiety, or uneasiness. Any of the above symptoms should be a sufficient*

*warning to the practitioner not to delay for a moment the measures requisite for interrupting the paroxysms.”**

In the treatment of miasmatic fevers, our main and great reliance is placed on cinchona and its preparations. “There is no substitute for these. They are universally relied upon for this purpose. In all countries and at all periods since the discovery of the properties of this invaluable and incomparable substance, amidst all the conflicting dogmas of different medical doctrines, Peruvian bark has never failed to sustain its reputation and to answer the expectations that have rested upon it. Amidst the manifold uncertainties of medical science, and the perpetual contingencies of medical art; amidst the disheartening scientific infidelity which has lately been taking possession of the medical mind, shaking to its deep foundations the firm old faith in the potency of drugs, and threatening to overturn and demolish it altogether—it is gratifying and consolatory to feel and to know that here, at least, we stand upon solid ground; that here we may hold that there is one great and important therapeutical relationship definitely and positively ascertained and established, defying alike the open assaults of quackery from without and the treacherous machinations of indolent skepticism from within.”†

The preparation of cinchona, almost universally employed, is the sulphate of quinine.

In the treatment of simple intermittent fever, little or nothing is required, during the cold stage, beyond endeavoring to keep the patient warm. Should there be much pain or disturbance of the nervous system, the use of opium is indicated. This may be most speedily made efficacious by hypodermic application—one-quarter of a grain of muriate, sulphate, or acetate of

* In the diagnosis of remittent fever, we have to consider the possibility of enteric fever, of pneumonia, of cerebral meningitis, of gastro-enteritis, or of yellow fever. Mistakes from these sources have only to be mentioned to be avoided, in the generality of cases.

† Bartlett on Fevers.

morphia being injected under the skin of the most convenient part of the body. In cases of vomiting and purging, this is the only prompt and reliable mode of administration.

Should the stomach be oppressed, or nausea be present, nothing gives so much relief as an emetic of mustard powder or of ipecacuanha. Spontaneous vomiting is best treated by copious draughts of warm water, rendered alkaline by soda, potash, or lime, if necessary. Sinapisus may be applied to the epigastrium, if nausea and emesis continue unduly.

In cases of great prostration of nervous system during the cold stage, it is frequently necessary to have recourse to stimuli, such as wine, brandy or whiskey, ammonia, ether, &c. If the stomach or bowels do not furnish a contra-indication, it is well, also, to give a scruple of sulphate of quinine by the mouth, or a half drachm by the rectum, in order to avert any tendency to the more serious form of congestive fever that *may* follow this peculiarity of the first stage. It is often advisable to continue the use of quinine, every two hours, in doses two-thirds as large, until cinchonism or complete reaction be produced.

For the management of pyrexia, in simple intermittents, little is needed. Cold sponging of the body relieves the burning heat; sinapisms or other rubefacients give ease to the neuralgic pains; gastric disturbance should be treated by means already indicated, and by the administration of carbonic acid. Cold drinks, not in too large quantity, assuage the thirst.

During the sweating stage, nothing is needed more than to take care that the patient do not take cold from exposure.

The practice of venesection, so much lauded by many authors, has not been alluded to, because there is no end attainable by it that may not be more easily secured by other means which are comparatively destitute of danger, and which do not postpone convalescence by weakening the patient. If it be advisable in any class of people, it is assuredly most so among soldiers, where a speedy return to duty should be one of the first considerations of the medical officer.

During the intermission, sulphate of quinine should be given in appropriate doses. To this, all other medication is secondary. With it, properly applied, all other medicines may be useless. The febrifuge may be given by administering two or three grains every two hours, commencing after the subsidence of the diaphoresis, and continuing the dose until cinchonism be produced, or the interval be passed in safety. Should the patient have had several paroxysms, at uniform and well marked times, it answers equally well to give a full dose—say ten grains—two hours before the time at which the first symptoms were felt.

Idiosyncrasy must be kept in view, a much smaller amount of the salt being requisite to produce cinchonism in some cases than in others. Occasionally, the remedy cannot be borne, from some peculiarity of constitution. Thus, in some women it gives rise to menorrhagia or to abortion; in males, to gastric trouble or delirium.

There is no contra-indication to its use, from any intercurrent inflammation that may exist. On the contrary, it is urgently demanded in pneumonia characterized by periodicity, as we often see it in malarious countries.

If the sulphate of quinine should not prevent a subsequent paroxysm, it will render it milder, and will soon check the disease entirely. Its use should be continued for at least two days beyond that on which the patient was last free from fever.

On the seventh, fourteenth, and twenty-first days, counting from the last attack, the patient should take ten grains of quinine, two hours or three before the time of day at which his last chill took place; or, commencing two days in anticipation, he should take each day as much as half a scruple.

It is desirable, in all cases, to give the remedy in solution or suspended in water, when practicable. If administered in the form of pills, these should be recently made.

Where the stomach cannot tolerate the febrifuge, we may use it by the rectum, taking care to increase the dose one half.

In all such cases, a complete solution should be effected by the addition of a drop of elixir vitriol or dilute sulphuric acid for each grain of the salt. An opiate may be advantageously combined with it, where irritability of the rectum exists.

The use of opium or of capsicum, in some cases increases the tolerance and efficiency of the quinine. From one to two grains of the former or its equivalent, in one of the morphine salts, with ten grains of the latter, may be used.

In obstinate cases, the paroxysm is more apt to be averted, when the patient is kept in bed for an hour before, and an hour after the time at which the chill is expected.

There is no special medication, beyond that already indicated, necessary in the treatment of ordinary intermittent fever.

Where failure attends our efforts to subdue the disease, in the manner indicated, it is well for the physician to examine into the quality of the febrifuge. The temptations to adulterate have been strong, and in many instances, the article dispensed is consequently inefficacious.

Should the disease have already lasted some time, it will be found advantageous, in obstinate cases, to combine the quinine with iron and capsicum, in the proportion of two grains of the former with one grain of dried, powdered ferruginous sulphate, and an equal quantity of red pepper. A pill thus composed may be administered every three hours, during the day, until thirty have been taken.

Chinoidine may be substituted for sulphate of quinia, by doubling the dose. It answers, in some instances, where an idiosyncrasy exists, preventing the use of the latter. It is far from uniform in strength. Of sulphate of cinchonine, the same remarks will apply, with regard to relative efficacy.

Salicine is efficacious in many instances. It should be given in at least three times the dose recommended for quinine. The same may be said of *beberine* and *cornine*.

It is not deemed necessary, here, to mention all the proposed substitutes that have been suggested for the active principle of

Peruvian bark. It is sufficient to say that none of them have stood the test of experience, when compared with the great remedy.

In rebellious cases, the arsenite of potassa, as administered in Fowler's solution, is, by most practitioners, thought to rank next after quinine, as a curative agent. It should be given in ten drop doses, in water, *after eating*. This seems to insure its more speedy action, and to prevent gastric irritation. Care should be taken to suspend its use, as soon as the facial œdema or articular pains it causes appear.

In patients who need a tonic, after the disappearance of the fever, there is nothing more advisable than the use of the nitric or nitro-muriatic acids. By some practitioners, indeed, the former is considered one of the most trustworthy febrifuges we possess. The *quinine bitters* are admirable for this purpose.

The practitioner should not fail to remember how often the effect of any strong impression on the mind serves to put off an intermittent paroxysm. A confident assurance, with certain psychological constitutions, has often prevented an attack of ague. The well known plan of administering a powerful emetic, as the infusion of boneset, an hour or two before the time for the chill, is well to be kept in mind.

If practicable, it is advisable, when anti-malarious remedies fail, to remove the patient from miasmatic influence. This, alone, in cases apparently intractable, has sufficed for a cure. The almost universally beneficial effects of a sea voyage are well proved.

In the treatment of *Remittent Fevers*, our endeavor should be, to put the patient, as soon as possible, under the influence of quinine. Much harm is done by the practice of waiting to "prepare the system," before administering the only really efficacious remedy. There may be instances, it is true, in which it is necessary to treat disordered conditions of the stomach or bowels, before the febrifuge can be taken; but such constitute exceptions to the general rule. *It may be taken as an axiom*

that the sooner we produce the state of cinchonism the more speedily and certainly the disease will be subdued. Traditional belief that inflammation contra-indicates the employment of cinchona still unhappily influences the minds of many whose experience in miasmatic ailments has been limited; thus allowing their fears of an imaginary evil to stand in the way of doing the only positive good to be effected by medication, in breaking up the fever.

Should there be irritability of the stomach, so great as to prevent retention of the quinine, the same course of treatment should be resorted to that has already been recommended for intermittent attacks. If the state of the bowels require a purgative, there is nothing more easily borne or more excellent in its effects than calomel. This may be given by combining ten, fifteen, or twenty grains of the mercurial with the same quantity of the quinine. Should the dose have failed to purge, in the course of six hours, a saline aperient may be advantageously administered. As a gentle medicine of this class, scarcely any is so generally applicable as the infusion of Epsom salt, senna leaves, and fennel or anise seeds. A wineglassful of this given cold, every two hours, is very little apt to be rejected by an irritable stomach, and is very sure to produce the desired alvine relief. Beyond this manner of prescribing calomel, it is doubtful whether it is advisable to go. The habit of systematically salivating patients for the cure of bilious fever is, happily, becoming a thing of the past. Common sense should guide us, after the first purgation, in prescribing such medicines as will tend to prevent constipation.

In case the first dose of quinine should not have produced the peculiar effects of cinchonism, within four hours, it is well to continue its use in smaller quantities, say from five to ten grains at intervals of like duration, until the paroxysm abate materially or the cinchonism occur. In cases of ordinary severity it may be necessary only to give a scruple of the salt, between the commencement of its administration and the

beginning of the next exacerbation. When indicated, the use of opium is of great service, in combination with the quinine. It is desirable to maintain the influence of the latter remedy for at least two days after the disappearance of the fever. Two grains every three hours will usually be found sufficient to effect the desired end. After this time, the convalescent should be treated as has already been indicated in the remarks on intermittent fever.

So much has been said with reference to the absolute necessity of venesection, for the successful treatment of remittent fever, that it is deemed proper to state the opinion of the best authorities with respect to it. By many, the use of the lancet is discarded, except in very rare cases; by nearly all, its employment is restricted to the early stages, and to a single depletion; whilst many of our most experienced and trustworthy observers believe that the use of cold affusion is competent to produce every result that would be expected from phlebotomy, with much more certainty and with much less danger to the patient. The fear of failing to bleed in inflammations is much diminished, since modern pathology has served to increase our acquaintance with the natural history of disease. How often have the subsidence and disappearance of supposed encephalitis been witnessed under the influence of efficient doses of sulphate of quinine! How often the amendment and resolution of a pneumonia in like cases of miasmatic poisoning!

No better rule can be given for applying the cold affusion than that laid down by Dr. Dickson:—"Seat your patient in a convenient receptacle, and pour over his head and body, from some elevation, a large stream of cold water. Continue this until he become pale, or the pulse lose its fulness, or his skin become corrugated, or he shiver." He is then to be wiped dry and put to bed. A remission, thus artificially produced, will follow, and may be repro cured in the same manner, if necessary. In case the chilly feelings continue too long, the length of the next affusion should be lessened.

Singular relief is often given to violent pain in the head by this means. It may almost be compared to the effects of an anæsthetic inhalation, in many instances. Dry cupping to the nucha and temples is serviceable.

For the urgent thirst of an exacerbation, nothing is so grateful and so advantageous as the effervescing draught of the U. S. Pharmacopœia. This not only diminishes the desire for drinks, but is, perhaps, the most efficient diaphoretic we possess. It is infinitely preferable to the common and distasteful spirits of Mindererus. When the stomach is tranquil, small quantities (a thirty-second part of a grain) of tartar emetic every two hours are beneficial. This is always attainable, is tasteless, and is prepared by putting a grain of the salt to a pint of water; dose, one tablespoonful. It is well understood that cold water or ice are to be allowed in small quantities and at frequent intervals.

For the gastric irritability, when severe, we may prescribe acetate of lead, one grain every hour or two, in solution; hydrocyanic acid; creasote; chloroform; lime water; epigastric blistering and endermic use of morphia; cold mint julep; opiates by the mouth, or by the hypodermic syringe. Occasionally a mustard plaster applied to the spine will prove efficacious.

During the exacerbations, the patient will not need more nourishment than is contained in barley, rice, or gum arabic water. Tea and coffee, taken cold, are often most grateful as well as useful, from their stimulant qualities. As soon as the appetite demands and the stomach will tolerate them, it is well to administer nourishing animal broths. Frequently, cold milk and lime water will prove all-sufficient for diet, and will be retained, whilst other food is rejected or causes epigastric distress.

In those instances in which, after eight or ten days, the disease proves intractable, and shows a tendency to pass into a form resembling typhus or typhoid fever, the treatment should

consist of support and such medicine as particular symptoms may require.

It is needless to say that premature exposure, in any way, is to be avoided ; that just care should be paid to having a proper quantity of nutritious, easily digested food, and that all possible hygienic precautions should be observed.

In describing the treatment of *Congestive Fever*, much might be written, but it would be of little benefit to the practical physician after what has preceded. To recover the patient from the stage of collapse, bleeding and mercurials are mentioned only to be condemned. The use of cold baths, or cold affusion, as described under the head of remittent fever, is perhaps as satisfactory and practicable a method as can be followed. When conveniences for this are wanting, the use of dry cups to the spine, warm applications to the surface with bricks, bottles, or by the hot-air baths, and friction of the skin, are to be recommended. The first indication is the same that has already been stated, viz. to produce the specific influence of quinine as soon as possible. It is doubtful if it be necessary to give more than a drachm in any interval. Never wait for intermissions ; let positive inability of the stomach or rectum to receive the medicine be the only obstacle to its administration. In desperate cases, raise one or more blisters by boiling water or by ammonia ; sprinkle the denuded cutis with the sulphate of quinine, reduced to the finest possible powder, covering the surface with oiled silk afterwards. Great caution is needed, during convalescence, rules for practice in which may be gathered from what has been said under the head of remittent fever.

No stress has been laid on the matter of prophylaxis. All that need be said in addition to the various deductions from what has preceded, is so completely set forth in Document D (31) of the publications of the Sanitary Commission, as to render further remark supererogatory.

For the Committee,

JOHN T. METCALFE, M.D.,

Chairman.

SANITARY COMMISSION.

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