

**On the effects of minute doses of mercury in restoring the vital functions /
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ON THE

EFFECTS OF MINUTE DOSES OF MERCURY

IN

RESTORING THE VITAL FUNCTIONS.

By A. P. W. PHILIP, M.D. F.R.S. L. & E.

(From the London Medical Gazette.)



It is now about five-and-twenty years since I first began to employ minute and frequently-repeated doses of mercury. I was led to them by observing, that the more the dose was lessened, and its frequency increased, the alterative effects of the medicine were the greater, pretty much in the same proportion as the immediate effects of each dose became less. It has long been my wish to lay before the profession the whole of the circumstances which influence this practice; but these are so numerous, and some of them, from the nature of disease, so complicated, that I have found it difficult to arrange the subject in a way that would give to others a clear and full view of it, and have thus hitherto been deterred from the attempt.

Having, in the early part of this practice, met with a few fortunate cases, I imagined that it was difficult to assign limits to its beneficial effects in a certain description of diseases. By degrees, however, these limits became apparent, but they have left a field more than sufficient to compensate for the pains I have bestowed on the subject. I have found, that with an attention to the circumstances which I am about to state, the minute doses never do harm, and this I believe cannot be said of any other mode of exhibiting mercury, and that in a wide range of cases, both original and sympathetic, they effect what cannot be effected by any other means with which we are acquainted; and it is particularly grateful to my feelings that I have

now obtained the testimony of many of my professional brethren to confirm my belief that they have been the means of saving many lives, which could not otherwise have been saved.

Large doses of mercury cannot be frequently repeated without often rendering the remedy as pernicious as the disease, and sometimes more so; and when they are given at distant intervals, the effect of one dose is frequently lost before another is taken; so that it often happens that little or no progress is made in the cure, and there is nothing but temporary relief to compensate for the debilitating effects of each dose; while, with respect to the minute doses, although each does little, this little it does without any strain to the constitution, and the next dose comes before the effect is lost; so that a gradual accumulation of the beneficial effect is obtained, and that, if the circumstances I am about to point out be attended to, without any injurious effects to deduct from it.

I need hardly say to those acquainted with our profession, that, in attempting to introduce the plan of treatment I am about to lay before the reader, I have had much opposition to contend with. This I have always regarded as a necessary effect of the nature of that profession, and have borne it patiently. When new plans are every day suggested, of which not one in a thousand proves to be of any value, we are naturally inclined to turn a deaf ear to the sanguine expressions of our brethren, when they

think they have hit upon any improvement of the usual means. But I owe it to them to say, that, with very few exceptions, I have found them as ready to admit the truth as I had any reason to expect, and in many instances anxious to ascertain it. Some, from the cause just stated, have joked in a good-natured way; and I could point out one or two who have sneered ill-naturedly enough—for there are necessarily men of narrow mind, as well as feeling, in every community; but when I say, that, in attempting to modify the employment of one of our most important means of cure, I have every reason to be satisfied with the reception I have met with from my professional brethren, I pay them a just, and, considering the nature of our profession, no trifling compliment; and, let our neighbours say as they will of our jealousies, I have never known any instance in which a sincere and rational attempt to improve the treatment of disease, has not met with a similar reception.

In the following observations I shall, in the first place, consider the *modus operandi* of mercury in general, which is necessary to a clear understanding of the principle on which the minute doses operate—then that of the minute and frequently repeated doses, compared with the usual mode of employing the medicine—and lastly, I shall point out the cases to which those doses are adapted.

Of the Modus Operandi of Mercury.

It appears, from every thing we know of the effects of mercury, and the laws of the living animal body, that it acts in two ways. It has a local and general operation, and its general operation is of two kinds. Like all other substances capable of affecting the living animal, it at the same time operates on the part to which it is applied, and on the system in general through the nerves of that part. But, as it is one of those medicines which are capable of being absorbed, it also influences the whole habit, by circulating with the blood, and thus directly acting on the various organs, by its immediate application to them; and although, as we might have foreseen, from the laws of the animal economy, it is capable, by its action on the part to which it is applied, of affecting every other part, the nervous system forming the

living animal body into a whole, which cannot be impressed in any one part without all others, more or less, feeling the impression, it is in the latter way that it most effectually influences them. Its operation is, more or less, that of a stimulant; for, according as circumstances direct it to particular organs, we find it exciting them to an increased performance of their functions. While it retains the active form in which it is introduced, it seems incapable of remaining in the system. If it be prevented from running off by one excretory, it finds its way by another; thus we see it exciting the skin, kidneys, salivary glands, &c. Like all other metals, in its metallic and insoluble form, it is inert; and it can only remain in the system when deposited in the cellular substance in that form, to which it is reduced by the chemical powers of the constitution; for, in whatever state it is given, these powers always reduce it to its original metallic form. It is well known that gold and silver are amalgamated with mercury, if worn by a person whose system is impregnated with it.

When taken internally, it is doubly applied to the stomach and bowels, immediately, and through the medium of the circulation, for we often have to contend with its irritating effects on the alimentary canal, when it is only introduced by the skin. In this canal and the salivary glands alone its passage excites sensible irritation, which, if considerable, causes inflammation; in the former only superficial, and generally in a slight degree, but in the latter often such as to affect all the neighbouring parts.

In both cases, as it generally increases the natural secretion of the parts affected, the increased discharge, like all other discharges, tends to relieve the inflammatory action; it is where the discharge is least—that is, where there is some impediment to the free operation of the mercury in increasing the secretion from the part, that the inflammatory tendency is greatest.

Such are the more prominent effects of mercury introduced into the system; but I have, in my *Inquiry into the Laws of the Vital Functions*, been at much pains to point out that there is no agent capable of affecting the living animal body that does not possess both a stimulant and sedative power with respect to it, according to the degree in

which it is applied, and the state of the body at the time of its application; the stimulant arising from the less, the sedative from the greater application of it; and that the degree in which each agent possesses the stimulant and sedative power is in no determinate proportion in different agents, but exists in every possible proportion. Thus spirit of wine possesses a great degree of stimulant, compared with its sedative tendency, which only appears when it is applied in excess; while tobacco possesses a great degree of the sedative, and little stimulant tendency, which appears only when it is applied in very minute quantity.

The sedative effect of some agents, as of opium, is chiefly exerted on the sensibility; of others, as tobacco, on the moving powers of the animal system. While the influence of the former, therefore, may be salutary, that of the latter, except under very peculiar circumstances, is always pernicious.

There may be some objection to using the term sedative for agents of both descriptions. In this sense, however, it is used by writers, although not constantly, but I think it is better thus to employ it than introduce a new term, as after this explanation no ambiguity can arise from it. Besides, as both act by diminishing the vital powers, it is convenient that there should be an appellation common to both, and what I am about to say will be sufficiently distinct, without a term to designate either alone. By sedative, then, I mean whatever depresses the powers of the system, whether sensitive or motive, and whether it affects both or either, although the more common use of the term confines it to the agents which impair the sensibility. No agent can impair the sensitive without more or less impairing the motive powers, because the latter in many instances depend on the former; but it is very possible to impair the motive without causing any diminution of the sensitive powers, and even with the effect of a morbid increase in them, because the derangements which accompany the weakened powers of life often prove to the sensitive powers a fruitful source of irritation. Thus that class of sedatives whose operation is on the motive powers alone, are often doubly pernicious.

Mercury, like other agents, possesses the sedative as well as the stimulant

property; and its sedative property appears to be wholly exerted on the motive powers—for when it appears to lessen the sensibility, this effect seems to arise merely from its removing some cause of irritation. Its sedative tendency is very different in different constitutions; and in some it exists to a degree that wholly precludes its employment.

Thus the injurious effects of mercury may be divided into two classes—those which arise from an excess of its stimulant, and those which depend on its sedative effect. By the former it may cause all the evils of extreme irritation; by the latter it tends more directly to impair the powers of life; and these effects admit of every degree, from that of a very mild to that of the most destructive agent, according to the quantity employed, the form in which it is given, and the state of the particular constitution.

Let us now consider what are the virtues of this medicine, which, notwithstanding its injurious tendencies, still render its use in this country more general than that of any other we possess; for it would be absurd to suppose that it had obtained this general employment, without possessing some extraordinary beneficial powers to compensate for its evil tendencies.

It will readily be supposed that a medicine, possessed of so great a power of exciting the various secreting surfaces, must prove a means of relief in many states of disease, especially those attended with a general failure of power in these surfaces. To this effect, for example, we are in a great degree to ascribe its beneficial operation in fever, particularly when it excites the bowels, or is determined to the skin, the most extensive of all the secreting surfaces; and in the various forms of dropsy, and other cases connected with failure of power in the extreme vessels.

In most instances, however, the failure in secreting surfaces is but the secondary part of the disease, depending on some more partial and specific derangement. If therefore the beneficial effects of mercury were confined to its influence on the secreting surfaces, the relief afforded by it would in most cases be imperfect and temporary; and this is often the case, when the original derangement is of a nature which it cannot influence.

But we find in many such cases, that it is often capable of permanent relief; it must, therefore, possess some beneficial tendency besides that of a mere stimulant to those surfaces. It is necessary, therefore, in order to understand the nature of the extensive influence of mercury in the cure of disease, to look for some other principle of action; and in the peculiar effects of this medicine, compared with the well-established laws of our frame, we shall find such a principle.

Although all substances capable of affecting the living animal act as a stimulant or sedative, according to the degree in which they are applied, yet there is in the effect of each something peculiar to itself. Thus we have just seen that the proportion in which they possess the stimulant and sedative powers is different in different agents, and that the latter in some agents is chiefly exerted on the sensitive—in others, on the motive powers. These are differences easily observed and readily classified. But there is an infinite variety both in the stimulant and sedative effects of different agents, which from their number and indistinctness cannot be reduced to any principle of classification; and physicians have attempted nothing further than to divide medicines into those best suited to influence the state of different organs. Thus we speak of aperients, expectorants, diaphoretics, diuretics, &c. and we have no means of knowing the peculiar properties of each particular agent, but by observing the effect it produces.

The most remarkable of the effects peculiar to mercury, is its influence on the liver. It is not surprising that a medicine which so powerfully influences the secreting organs in general, should influence its secreting power; but, independently of this effect, it has a specific operation on this organ, a power not merely of exciting its function, but of correcting the various derangements of that function in a way which it does not possess with respect to any other organ, and which no other medicine possesses with respect to the liver; and that even to such a degree as not only to restore a healthy state of the bile in various deviations of this fluid, but often even to correct the most formidable change of structure in the organ which secretes it.

In my treatise on Indigestion, I have

had occasion to point out at length the intimate sympathy which exists between the stomach, liver, and duodenum, the three chief digestive organs, which so constantly partake of the affections of each other, that all are injured or relieved by causes affecting any one. Thus mercury possessing no particular power of relieving the affections of the stomach or duodenum, and even ungrateful to both, often becomes indirectly the best means of relieving their derangements, so often caused or supported by a disordered action of the liver.

When, therefore, we consider that the sympathies of the digestive organs are more extensive than any other, so that there is hardly any disease of which they do not partake, and whose course is not influenced by them; we are at no loss to find one cause of the extensive effects of the medicine which so essentially influences them.

But a principal cause of this extensive sympathy of the digestive organs, is the peculiar sympathy of the liver itself with the chief source of nervous power, the brain; in consequence of which, all the affections of the one are immediately felt by the other. However severe inflammation of the stomach and bowels, the intellects remain unaffected. I have seen it prove fatal within twenty-four hours, the mind remaining entire to the last; while acute inflammation of the liver is generally attended with delirium. Melancholy even takes its name from a morbid state of the bile; and severe blows on the head are more apt to excite inflammation of the liver than of other organs.

When it was supposed that the office of the brain was chiefly confined to the mental functions, and that its principal relation to other parts was that of bestowing sensibility on them—when it was supposed incapable of directly influencing either the heart or blood-vessels, on which the vital powers so evidently depend, we had a very inadequate idea of the importance of this organ in the animal economy; but now that we know that it is not only capable of directly influencing the action of the heart and blood-vessels, and that to their minutest ramifications in every part of the system, and that the secreting and other assimilating processes are not merely influenced by, but wholly dependent on it and the spinal marrow,

we can easily understand how its affections control all the functions of life*, and can feel no surprise that whatever essentially influences it, should also extensively influence the phenomena of disease.

These are fruitful sources of the influence of the liver in diseased states of the system; but even these are not its only sources. All other parts receive their blood directly from the heart; it receives the principal part of its blood from the other abdominal viscera. It is thus also, as well as by its sympathy with the brain, intimately connected with the whole tract of the alimentary canal, the internal surface of the body, and through it, in consequence of the intimate sympathy which exists between it and the external surface, with this surface also. No affection of either can take place, without more or less affecting it through both the nervous and sanguiferous systems; and by the state of these surfaces, more than any other cause, the phenomena both of health and disease are influenced. The great extent of the liver is also to be ranked among the causes which contribute to its influence in the animal economy, in consequence of which, whatever influences the distribution of the blood in it, more or less influences its distribution in every other part. Such are the conclusions, respecting the influence of the liver, to which we should, *à priori*, be led by a knowledge of the structure and functions of our frame, and they are amply confirmed by direct observation.

All who have had extensive opportunities of observing the phenomena of disease, must be struck with the manner in which the state of the liver influences, and is influenced by them, to whatever class they belong. It is unusual in any formidable disease, whether general or local, not to find the function of the liver more or less disturbed; and wherever it is influenced, the proper treatment of the disease more or less depends on the state of this organ. It is by no means uncommon to find diseases, particularly of the vital organs, intractable till the accompanying derangement of the liver has been observed and corrected; and I have often in such cases seen, not only the patient, but the medical attendant, surprised at the immediate relief thus obtained.

When, for example, inflammatory affections of the chest have been but im-

perfectly relieved by the usual means, and have constantly continued to recur; or the patient has laboured under an obstinate though languid fever, with confusion of mind, and sometimes a low muttering delirium, a fulness and tenderness of the hepatic region have been discovered; on relieving which, by the usual means, the whole of the symptoms have immediately yielded.

Thus it is that in warm climates, where the sympathies of our frame are most active, not only in all febrile diseases, but even in all chronic deviations of health, affections of the liver become the leading feature.

I have for many years past, in every case, whether acute or chronic, been in the habit of examining the state of the hepatic region as regularly as that of the pulse; and I think all who will take the trouble to do so, will confess that the one examination is often of as much importance as the other, and in many cases the former the most important of the two.

It is the sympathy of the liver with the general source of nervous power, and the other circumstances relating to this organ which have been enumerated, that, even more than the sympathies of the digestive organs in general, gives to the medicine that so powerfully controls it, its extensive influence in the treatment of disease.

Such I conceive to be the causes which have rendered the employment of mercury so general in the practice of this country; which, resting on more extended as well as more accurate principles, it is not assuming too much to say, is more effective than that of perhaps any other. If the state of the liver be so extensively connected with that of all other parts of the system, and, in particular, so powerfully influence the other digestive organs, with all their extensive sympathies; is it surprising that a medicine which has so great a power in controlling the affections of this organ, should hold a chief place amongst the means of cure; and that in the country where the practice of medicine is best understood, it should be found in most general employment?

It will be admitted from all that has been laid before the reader, that, to say nothing of its effects in the disease for which it was first introduced, the treatment of which chiefly belongs to the surgeon, it is well worth while to inquire into the best mode of employing so essential and powerful a means; and

* Inquiry into the Laws of the Vital Functions.

this is the more necessary, because, like other means capable of great good, it is also capable of great injury. Its beneficial effects have naturally led to too incautious a use of it; by which much mischief has been done, and the remedy itself, with those who either lack opportunities or correct powers of observation, brought into discredit.

The result of my own experience (and there are few whose attention has been more directed to the subject) is, that although there are many circumstances under which large doses of mercury are not only beneficial but essential; the quantity employed in this country has on the whole been at least ten times greater than that from which its most beneficial effects would accrue. It unluckily happens, that, in a large proportion of cases its most beneficial employment is not always that which produces the most immediate benefit; and in grasping at too much, we often not only lose the advantage of the remedy, but convert it into a source of injury.

It is a law of its action, that when it is directed to one outlet it is less inclined to pass by others; thus, when it is passing off rapidly by the skin, which is known by the scarcity of urine,—if, in consequence of taking cold, or an increased quantity of the medicine, it is thrown on the salivary glands, the usual secretion of urine is restored, indicating that it is no longer powerfully exciting the skin, or perhaps increased, for the salivary glands affording but a narrow outlet, it still in part tends to pass by other channels. It seems to be on this principle that salivation renders it more powerful with respect to the disease; but it seldom produces this effect unless the system is highly impregnated with it, and then—to say nothing of the irritation occasioned by the salivation itself, which is often great—its sedative effect is frequently much felt, and the whole powers of the constitution are, for the time, enfeebled by it.

It was a maxim of the older practitioners, that its beneficial effects are proportioned to the degree of salivation it excites; and I have heard the late Dr. Monro, of Edinburgh, state the quantity of saliva which must be discharged daily, in order to eradicate particular affections. Can we be surprised that, when such maxims prevailed, the remedy proved sometimes worse than the disease, and that so

strong a prepossession against it has arisen?

I have said that before salivation takes place the system is generally much impregnated with the medicine. This is not always the case. In particular constitutions the smallest dose immediately affects the salivary glands. Thus, although in general we find mercury most effectual when it produces salivation, in some habits this occurs so readily as wholly to preclude its employment, and consequently to render it useless as a remedy. In others the same consequence ensues from the sedative effect immediately arising from such minute doses that, from this cause also, its injurious effects alone are attainable.

The following are the most remarkable instances of these peculiarities which I have met with. From the fear of hurting the feelings of individuals in the few remarkable cases I shall have occasion cursorily to relate, for the purpose of illustration, I shall abstain from giving the names. This is the more necessary, because in a large proportion of these cases the patients were members of families well known to the public. I am ready, however, to state them, and any other circumstances of these cases, to any respectable practitioner.

I was requested to see a lady, whose apothecary informed me that although her case was bilious, she had been obliged to abstain from mercurial medicines, in consequence of only half a grain of blue pill, and that, after she had for some time recovered from the effects of former doses, having occasioned salivation. Finding that her mouth at the time I saw her had been well for some weeks, I advised him to repeat the mercurial, but still to lessen the dose. She took a quarter of a grain of blue pill on going to bed, and the next day was in a state of salivation.

In the following case the degree of sedative effect produced by all mercurials, equally precluded their employment. A lady had long laboured under bilious affections, which were gradually impairing all the powers of her constitution. The cause of their obstinacy was, that she was incapable of bearing even the smallest doses of mercury without a degree of irritation and depression which had precluded its employment; and no other means had been found an effectual substitute for it. Calomel, on the whole, seemed to produce less depression than the blue pill; and after many other trials, in which the

dose was more and more reduced, her husband and myself, that we might be assured of the accuracy of the medicine, saw one grain of calomel equally distributed in eighty pills of extract of liquorice. One of them was given to the patient without letting her know that it contained any mercurial, and in two or three hours she said she knew she had taken mercury, for she felt the symptoms which nothing else ever produced. She afterwards visited various parts of England, for the sake of change, and was under the care of various physicians, who all attempted to find some mode of exhibiting mercury which she could bear, but in vain; and her disease proved fatal for no other reason than that she was unable to bear the only effectual means of relief; for in the first instance it was nothing more than the common bilious affection which, in the beginning, in most constitutions yields with certainty to a very moderate use of this medicine; but even this slight affection we had no means of arresting without it, so that it gradually preyed on the constitution. The diseased action of the liver by the laws of sympathy extended to other organs, and at length destroyed all the powers of life.

No case can more strongly evince the value of the medicine. This lady died because her constitution was wholly unfitted for it, and we had nothing which could supply its place.

Those who are prepossessed against it and other powerful medicines, in their fear of the medicine are too apt to lose the fear of the disease. They are insensible to the risk of delay, which often converts a disease of easy cure into one altogether hopeless.

The effects of mercury, we have seen, may be divided into two classes—its local and general effects. Many of its effects, both good and bad, depend on its operation on the parts to which it is applied. It may appear at first view extraordinary that any of the effects of mercury should arise from its action on the particular part of the skin to which it is applied, and any effect which can be ascribed to this cause I believe to be very slight; but, under certain circumstances, it is sensibly felt. We know, that however free from any direct communication, either by nerves or vessels, neighbouring parts of the animal body may be, they never fail to sympathise, one among many proofs that the

power of sympathy is referable to the central parts of the nervous system; and although a mercurial plaister worn on the region of the liver be too feeble a remedy to be sensibly felt in a case of severity, and where more powerful means are employed; yet in removing the last remains of debility of the liver, and in preventing its return, I have found it a means of considerable efficacy; and have known instances where health was preserved by it, and the patient constantly had a recurrence of bilious symptoms on laying it aside. I am inclined, from what I have seen, to ascribe a great part of the effect of this remedy to the local effect of the mercury in the neighbourhood of the liver. A very minute portion of the mercury, no doubt, is absorbed*, but many times the same quantity thrown into the system in any other way would not produce the same effect. To the same cause we must, I think, in some degree ascribe the greater efficacy of mercurial friction on the region of the liver in confirmed organic disease of that organ, than of any other way of employing this remedy. Something here is doubtless to be ascribed to the friction; but I believe the same friction on this part will not render other modes of exhibiting the medicine equally efficacious.

Whatever may be said of the local effects of mercury applied to the skin, there can be no doubt of its local effects, both good and bad, when applied to the stomach and bowels; and I shall say the more on this subject, because I have found it one of the points of most consequence in regulating the employment of this medicine.

It is the circumstance which appears to render the internal so much more beneficial than the external use of mercury, where it is not our object to produce any considerable impregnation of the system.

We have a familiar instance of the effect of the local action of mercury on the stomach and bowels, in controlling the action of the liver, in that of a few grains of calomel allowed to pass through the canal, however rapidly, in emulging the ducts and restoring the due secreting power of this organ. To the same cause I ascribe the greater efficacy (which I have ascertained by many trials) of the

* I have seen the gums affected by a mercurial plaister.

same dose when an aperient is taken six or eight hours after the mercurial than when it is taken with it; in which case, it is too much hurried through the stomach and first intestine to produce its full local effect on the liver.

Hence the good effects of the usual practice of giving the mercurial at night and the aperient in the morning. A few grains of blue pill given at night, and carried off by an aperient in the morning, will have a decidedly greater effect in restoring the action of the liver than when the aperient is taken with it, although the mercury may remain as long in the canal. In the latter case, it is conveyed more quickly to the lower bowels, which have not the same sympathy with the liver as the stomach and duodenum have. With calomel the difference, though still perceptible, is less evident; because the calomel, by its own action, passes more quickly than the blue pill, and is on this, as well as some other accounts, as I shall have occasion more particularly to point out, a less beneficial alterative.

This mode of employing mercury was very generally adopted by Mr. Abernethy. He gave a few grains of the blue pill every second night, and carried it off by an aperient in the morning; and his employment of these means was so general that he has been accused of an almost indiscriminate use of them. How far this accusation is well-founded, it is difficult to judge; but many who smiled at his practice were less acquainted with the laws of the animal economy. He knew, and has shewn, in his excellent treatise *On the Constitutional Origin of Local Diseases*, how various, and often even opposite, are the effects proceeding from the state of the digestive organs, depending on their extensive sympathies and peculiarities of constitution; and he found his mode of exhibiting mercury powerful in relieving them, and his experience in this respect I have found amply confirmed by my own. But I shall, in a future part of this communication, attempt to point out the limit to which its efficacy extends, which he had not ascertained; and the plan of treatment which must then be adopted, in order to produce the same good effects. The two plans have this in common, that they are both arranged with a view to avoid the sedative effects of the medicine; which is an essential princi-

ple in its employment in all cases, except where life is in immediate danger, and for want of other means such a contest between the disease and the remedy becomes necessary as sometimes almost makes it doubtful from which the risk is greatest. Such a use of mercury is only justifiable where we know the continuance of the disease to be certainly fatal.

From the local effects of mercury little is to be apprehended, if the dose be not too frequently repeated. In this it resembles the effect of an emetic. If an over-dose be given, the only effect in general is, that it operates the more speedily and effectually. In this way we may explain the alleged safety of doses of twenty or thirty grains of calomel, of which I have no experience, but which, some years ago, were not unfrequently given in this country; the rapidity with which they were carried off compensating for the greatness of the dose. Various accidents, however, may render such excessive doses unsafe, and I believe they are now little employed, and that, in this country at least, all their good effects may be obtained by much smaller quantities. It is from the constitutional operation of mercury, however—or I would rather say its constitutional and local operation combined, the former always more or less including the latter—that its most important effects, whether good or bad, arise.

It is a remarkable fact, that as there are some constitutions in which mercury, as we have seen, even in the smallest doses, acts as a poison; there are others which will bear an excessive use of it without injury; as in some the sedative effect arises from the most minute doses, in others it seems incapable of any great degree of this effect in the largest quantity in which we ever employ it. The following is the most remarkable instance of this kind I have met with, which I shall concisely lay before the reader, before I enter farther on the principles on which this medicine appears to operate.

The patient was a boy of about twelve or thirteen years of age, labouring under dropsy of the belly. All diuretics had failed, and several gallons of water were drawn off from him by tapping. The liver was found indurated, and occupying a large portion of the flaccid abdomen, and the rest of it felt like a

cluster of grapes; so much enlarged and indurated were all the smaller abdominal glands. In about eight days, although the patient drank but little, a collection of water to the same amount was formed. Such had been the rapid absorption of moisture from the air by the skin and lungs, the only source from which it could be derived. All diuretics still failing, I then, in conjunction with a well-informed and highly experienced apothecary, told the father of the patient that the only chance of recovery was a mercurial course, carried as far as the constitution could bear. I warned him that its effects would be severe, and its success doubtful; and proposed a consultation of physicians before entering on the plan. This he declined, and placed his only child wholly in our hands. The patient was of a scrofulous habit, which I have, contrary to what we should at first view have supposed, generally found favourable to the use of mercury. It may easily be supposed that, under such circumstances, we found great difficulty in producing an affection of the mouth. The apothecary, although advanced in life and in the most extensive practice, had never seen so great a quantity of mercury used as in this case. It was used both externally and internally.

As soon as the mouth became decidedly affected, the diuretics began to act; and in the space of some months the whole of the water was discharged in the natural way. But we had an obstacle to contend with which still threatened a fatal termination. As often as we attempted to lessen the mercurial influence, the water again began to collect. This I regarded as proving the glandular obstruction not to be yet wholly subdued, although the abdomen had now the natural feeling to the hand; and the question was, whether the patient could bear the mercurial course long enough wholly to subdue it. In the meantime we were encouraged to proceed, as his strength, as well as his health, continued to improve under it. In all, he was kept in a state of salivation for a year and a half, before it was possible to lay aside the mercury without a return of the disease. At the end of this time he was free from complaint, and remained so without the further aid of medicine. But the most remarkable circumstance of the case was, that, although he had

always been so sickly a child that from his birth there were hardly any hopes of rearing him, he became, after this course, one of the stoutest and healthiest young men I knew; and the only bad consequence of so unusual an employment of mercury, was the loss of two or three of his grinders, which came out during the long protracted salivation. No case can more strikingly illustrate the power of mercury in glandular disease, under which it was evident this boy had laboured from birth.

If we except the function of propelling the blood, all the functions on which life depends take place in the minute extremities of the nerves and blood-vessels; and even the motion of the blood in the immediate organs of those functions depends on the vessels employed in them, and in no other respect on the heart and larger vessels than that from them they receive their supply of blood. Till the supply fails, the circulation goes on in the capillaries, even after death; and with the same vigour although a ligature is thrown round all the vessels attached to the heart, and this organ cut out, as when the circulating system is entire*. Hence the emptiness of the arteries some time after death; and if the capillary vessels of any part, during life, be deprived of their power by causes confined to them, the blood immediately becomes stationary in them, although the heart and every other part of the animal be entire and vigorous†.

Now the great value of mercury arises from its influencing the action of the extreme parts of the nervous and sanguiferous systems more powerfully than any other medicine we possess; and to the same cause, as appears from what has been said, all its injurious effects, with the exception of the sedative effect in which it appears to operate on all parts of the system, may be ascribed. The discharges by which it debilitates are from secreting surfaces, and it is by its effects on them that it occasionally causes so much irritation; and the greater liability to the effects of taking cold, produced by it, is from the open state it maintains in them.

Let us inquire under what circumstances it is most apt to produce its various effects, and by what means the fa-

* Inquiry into the Laws of the Vital Functions.

† Ibid.

vourable may be secured, and the unfavourable guarded against.

Its rapid effects on the extreme parts of the nervous and sanguiferous systems, and particularly those of the liver, render it a powerful means of temporary relief under a variety of circumstances; and the permanency of its effects, under proper management, bestows upon it great power as an alterative.

Of its various preparations, some are better adapted to the former, others to the latter effect. Calomel is best adapted to produce the more rapid effects, particularly the sudden excitement of the liver and the secreting surface of the alimentary canal; but its milder preparations answer better as an alterative. Peculiarity of constitution is sometimes as remarkable in the different effects of its particular preparations as in the general effects of the medicine itself. In some, the smallest dose of blue pill occasions nausea. I have almost always found, in such cases, that the stomach bears calomel better: but it is more apt to irritate the bowels; and from this cause, and probably its passing more quickly along the alimentary canal, it does not answer the purpose of an alterative so well. The tendency of mercurials to oppress the stomach is generally found in the opposite proportion to their activity. Blue pill is lighter than the hydrargyrum cum creta, calomel than blue pill, and oxymuriate of mercury, which can only be given in extremely small doses, will often agree with the stomach when all other mercurial preparations oppress it. It is only, however, in a few constitutions that the blue pill, especially in small doses, has much of this effect, and it is, on the whole, the most convenient, as well as effectual alterative. It is more effectual, and in general lighter on the stomach, than the hydrargyrum cum creta, without being much more inclined to irritate the bowels, and it has much less of this tendency than the more active preparations.

On the more temporary effects of mercury, I need not dwell. Every medical man is aware of the benefit often derived from suddenly exciting the liver and determining the fluids downwards by its operation on the extensive surface of the alimentary canal. Here, except in constitutions peculiarly sensible to its sedative effect, any injury that may arise depending simply on the irri-

tation and discharge it occasions, may be lessened, by its less frequent employment; but the chief difficulty here is to judge when the peculiar effects of this mode of exhibiting the medicine are obtained, and we are called upon either to abstain from it altogether, or employ it in a different way.

The sudden advantage often obtained by this mode of exhibiting mercury, is flattering both to the practitioner and to the patient; and I have often seen it persevered in when its debilitating effects greatly exceeded any advantage derived from it; for from the nature of this mode of employing it, its benefit must always be greatest at first, when the accumulations, whether of blood or vitiated secretions, are greatest, and the patient's strength most entire.

After the due distribution of the blood is restored, and the vessels of the liver emulged, there is nothing more to be expected from the temporary effects of this medicine. It is only necessary to renew them when the evils which called for them recur. If the removal of these evils do not restore the patient, we may be assured that he labours under a permanent derangement of function somewhere, if not of structure also, which may be aggravated, but cannot be counteracted by such means; and that if the fault be such as mercury is capable of correcting, it must be by rendering the effects of the medicine, like the disease it is intended to relieve, more permanent. We must abandon the hope of doing much in a little time, and attempt by gentler means to solicit a return of the healthy action. Under such circumstances the practitioner always finds that as the benefit of his active doses is lessened by their repetition, their debilitating effects increase, and soon begin to compensate, and at no great distance of time more than compensate, for any advantage derived from them. He is thus obliged to relax his plan, and not unfrequently wholly to lay aside the remedy before the disease is subdued.

Many of the same observations apply to an alterative course, when the doses are considerable. If these also fail to afford permanent relief, and the disease be one of immediate danger, requiring the prompt and powerful effects of mercury, and such as no other medicine can produce, the chance of recovery is then at an end; and we have nothing more in our power than to hus-

band the remaining strength, and contribute to the patient's comfort for the short time that he has to live; but if the disease be more or less of a chronic nature, we have still a resource. Time may be given to effect by degrees what cannot be effected rapidly.

The question is, whether in lessening the dose of the medicine, we lose as much as we gain; whether in rendering it less debilitating, we in the same proportion render it less effectual. This we have reason to believe is the case with respect to each particular dose, but we obtain the great advantage of being able without injury to repeat the dose more frequently, and however small may be the beneficial effect of each dose, if we can give another before that effect is wholly lost, the benefit necessarily accumulates.

Such are the principles which gradually led me to minute, and frequently repeated doses of mercury. It remains to consider more particularly their *modus operandi* as compared with that of larger and less frequently repeated doses, and point out the cases in which I have found them most beneficial.

Of the Modus Operandi of minute and frequently repeated doses of Mercury.

I had occasion to observe, in speaking of Mr. Abernethy's plan of exhibiting mercury in diseases of continuance, that when it fails there is another which is often successful. This consists simply in greatly lessening the dose, and in the same proportion increasing its frequency.

The benefit derived from this change depends on the most fundamental laws of our frame. I have already had occasion to point out that all agents capable of affecting the living animal body, act both as stimulant and sedative, according to the quantities employed, and we call them by one or other of these names, according as they are best fitted to produce the one or other effect.

Spirit of wine we call a stimulant, because in all moderate quantities it produces the stimulant effect, but there is a quantity of it, as appeared in the riots of Lord George Gordon, when many of the mob took draughts of spirits of wine, mistaking it for common gin, which produced instant death without any degree of previous excitement. Digitalis we call a sedative, because in

ordinary doses it acts as such, but it appears from very accurate experiments that in extremely minute doses it acts as a stimulant.

Mercury is one of those agents in which the stimulant and sedative effects are so nearly balanced that neither predominates so much as to obtain for it either appellation, but it observes the same law as all other agents capable of affecting the living animal body. In small or moderate doses the stimulant effect prevails; in excessive doses the sedative; and the repetition of even moderate doses, unless at very distant intervals, seldom fails at length to produce more or less of the latter. Is there a dose, then, so small as to produce little or no sedative effect, and yet capable of the stimulant effect on which we have reason to believe the beneficial tendency of this medicine always depends? Is there a dose in which, in most constitutions, the sedative effect either does not take place, or takes place so slowly that the cure may be far advanced before the patient begins to experience any degree of it?

The result of my experience is, that there is such a dose.

With respect to its amount, it varies from half a grain of blue pill, the largest dose I almost ever employ with a view to the alterative effect, to the eighth part of a grain, the smallest dose from which in general much good can arise, though there are cases in particular constitutions in which I believe much smaller doses than even this will be found beneficial, and the interval at which the dose has been given is from six to eight hours. By these doses, given at such intervals, we can in most constitutions, and for a considerable length of time, in some for an unlimited time, obtain the stimulant without the sedative effect of the medicine, which is the great object in the employment of mercury. We thus, as far as the particular constitution is capable of it, secure the whole of its beneficial, without any degree of its injurious, effect.

As soon as the latter is perceived, it must either be obviated or the medicine laid aside, for nothing will compensate for the sedative effect of this medicine, whether produced by large or small doses. It is as certainly injurious as the disease, but as in the case of the medicine, it is always in our power to remove the offending cause; in the hands

of a prudent practitioner we have the chance of benefit without the risk of injury, unless the certainly fatal nature of the disease makes it advisable to risk to a certain extent the sedative effect of the only means of cure.

With respect to the minute and frequently repeated doses, I would say without hesitation, and from ample experience, that in all cases except where the great discharges, or other rapid effects this medicine is capable of producing are required, they are not only the safest but the most effectual mode of exhibiting it. Their operation appears to be that of a gentle but constant stimulant, exciting to due action the various organs of assimilation, and particularly the liver. The following case is strikingly illustrative of their power in producing the peculiar effects of the medicine, and I could add many others of a similar nature.

A lady came from a great distance to London, for the purpose, she said, of being salivated, which she had been told would cure her of a bilious complaint, under which she had laboured for many years. For this purpose she had taken in vain, in the country, very large doses of mercury, much beyond the largest usually given in this climate. I saw no occasion for salivation, but directed for her, with other means, half a grain of blue pill three times a day. Her case did not require frequent visits, and not being then so well acquainted with the effects of the plan, I thought, as the mouth had resisted such doses, that no precautions respecting it were necessary, when, at one of my visits, after she had taken the medicine for about a fortnight, I found her in a state of severe salivation, the whole of the face was swelled, and she was for a considerable time confined to bed. At no great distance of time she left London well, and I learned from her sister, who two years afterwards was placed under my care, that she remained so.

It is not difficult to perceive the principle on which the minute doses are so powerful. From their little aperient tendency they readily enter the system, and, from the little irritation and excitement they occasion, they are not apt to be thrown off by it. Such cases as the preceding, and I could mention many, in which a certain affection of the mouth arose from even smaller quantities, which, had they

been continued, would soon have produced the same effect as in the preceding case, prove that the peculiar effects of mercury may be obtained in any degree we please by such doses. What, then, can be the motive for employing larger ones, unless, either from the nature of the symptoms or the urgency of the case, the more active effects of the medicine, or the more rapid impregnation of the system be required; or, as happens in certain diseases, the powers of the absorbing vessels are so impaired, that minute doses are no longer capable of exciting them, and therefore cannot enter the system.

The cause of the minute doses sometimes producing an effect on the gums, when larger doses fail, arises from the latter being so much more powerful in exciting the excretories, by which, in certain constitutions, they are often thrown off as fast as they are taken, and thus little impression is made either on the mouth, or the disease. It is to the thorough manner in which the minute doses are received into, and retained in the system, and the general, steady, and gentle impression they make, that they owe an efficacy which surprises those who have not been accustomed to see their effects.

Such doses, of course, have little effect in suddenly emulging the biliary ducts, and thus discharging collections of vitiated bile, and, until they succeed in restoring the due action of the liver, which in general requires some time, these collections are in many cases more or less apt to form under their use, and occasionally to require the operation of a more active mercurial, the necessity for which is different in different cases, according to the tendency to such accumulations. Where there is no tendency of this kind, the active dose is unnecessary, and its frequent repetition is seldom proper. Calomel, we have seen, generally answers the purpose of the larger dose better than the blue pill; although, in the more obstinate cases, I have sometimes found a combination of the plan I am now describing, and that of Mr. Abernethy, the most successful.

Of the Cases to which the minute and frequently repeated doses of Mercury are adapted, and the circumstances to be attended to in their employment.

I am now to point out more particu-

larly the cases, both acute and chronic, in which I have found minute and frequently-repeated doses of mercury most successful; and the various circumstances to be attended to in their exhibition. I shall, in the first place, speak of the chronic cases. In them I was first led to this use of mercury, and its effects in them gradually led to it in acute cases.

It appears, from what has been said, that the cases in which mercurial medicines are most successful are those (a very numerous class) in which the state of the liver is more or less essentially concerned.

Indigestion, which forms an important part of so many chronic diseases, either as a cause or a consequence, generally begins when it is the original disease, at least in this country, with debility of the stomach, which spreads to the liver and duodenum, and thence, more or less, to the rest of the canal. While it is confined to the stomach, it is for the most part readily relieved, by a proper attention to diet, and what are called stomachic and tonic medicines. If not relieved, the debility always spreads to the liver.

The disease, being then of a complicated nature, begins to obey different laws. The various affections of each organ by sympathy influence the other, and the evil increases in a double proportion, and will no longer yield to the simple means, in the first instance generally successful.

The action of the stomach is now more impeded, by the effects of the disordered liver, an organ of more intimate and extensive sympathy than the stomach, and which must be restored before the latter can recover its tone, than by its own original debility; and thus, in cases of long standing, the cure depends more on the relief of the liver than of the stomach itself. The affection of the former not only renders the symptoms both more complicated and more severe, but also more obstinate. It is the chief impediment in our way.

The greater part of the suffering in such cases, indeed, depends more directly on the state of the liver than the stomach, arising from its influence on the centre of nervous power, and the action of the first intestine immediately depending on the state of the bile. The state of this intestine is the best, and, as far as I know, the only accurate mea-

sure of the due action of the liver. In proportion as the bile deviates from its healthy properties, the action of the duodenum languishes; it fails duly to carry on its contents, allowing the imperfectly digested food to accumulate in it, which causes a fulness in the region of this organ that may always be readily distinguished by comparing it with the corresponding part of the left side, and proving a source of a great part of the nervous irritation which attends protracted cases of indigestion*.

As the fulness of the region of the duodenum is here the best measure of the state of the liver, it is necessarily the best measure of the effects of the alterative. As the languor of the duodenum arises from a vitiated state of the bile, it is reasonable to suppose that a more healthy bile will relieve it; and we find, in fact, that precisely as the due action of the liver is restored, the activity of this intestine returns, an effect not to be procured by any ordinary aperients, however powerful, and without which it is in vain to expect any material abatement in the symptoms of the disease.

Now it is under such circumstances that I have found the minute and frequently-repeated doses of mercury so effectual in indigestion, and the various cases which arise from, or are supported by, this state of the digestive organs; and in the more obstinate cases in which habit has confirmed the disease, the larger doses, necessarily given at longer intervals, almost uniformly fail, so that it has been customary to regard them as incurable; and when the disease is confined to the digestive organs, the patient is advised to be cautious respecting diet, keep the bowels regular, amuse the mind, and think as little of his complaints as he can—the last an attempt in which he is generally most unsuccessful; for, from the great sympathy between the liver and brain, he generally broods over them, till, by degrees, they occupy his whole attention.

* This subject is fully considered in my *Treatise on Indigestion*, and my reasons pointed out for believing that the fulness in question arises from the state of the duodenum. But whether it arises from the state of this intestine or not, I know, from the careful observation of more than twenty years, that its degree may be confidently relied on as a measure of the state of the secreting power of the liver, and I believe there is no other such measure: all others I have found more or less fallacious. By practice the hand becomes sensible to the slightest morbid fulness of the region in question.

Here, in such cases, is the limit at which I have found Mr. Abernethy's plan almost uniformly unsuccessful, and where the employment of the minute doses, as far as I know, is the only effectual means of relief.

I have, in my *Treatise on Indigestion*, been at great pains to point out a change which almost always takes place in the progress of that disease, and, if we except the state of the liver, more than any other circumstance influences the treatment of protracted cases. The long-continued nervous irritation which attends it, here, as in all similar cases, produces more or less of an inflammatory tendency, and a tenderness on pressure is generally perceived in the region of the pylorus and left edge of the liver. The pulse always becomes more or less tight, and the patient often, especially in the evening and early part of the night, experiences more or less tendency to increased heat, which frequently shews itself in a burning of the hands and feet, although this tendency is by no means so uniform a symptom as the tight pulse. The state here described essentially influences the effect of the mercurial. I have had occasion to point out that the favourable effect of mercury is its stimulating effect. The more inflammatory the state of the habit, the less, of course, it is suited to this effect.

The larger the dose this is the more felt, and it is one of the advantages of the minute doses, that they have little tendency to increase the inflammatory disposition; but still their beneficial operation is sensibly impeded by any considerable degree of it. Every practitioner has remarked the proneness of mercury to produce a feverish state, and that in inflammatory cases it is chiefly useful when given in such a way as to occasion a copious discharge from the bowels, which compensates for this tendency.

I have found the tightness of the pulse no obstacle to the exhibition of the minute doses, which never appear to increase it, and often, especially when they act much on the skin, sensibly relieve it; but when the inflammatory tendency goes so far as to occasion much tenderness in the region of the pylorus and left edge of the liver which lies upon it, where the tenderness always in such cases, as I have just observed, first shews itself,

the operation of the alterative is greatly impeded; and it is necessary by local means to relieve this tenderness, in order to obtain its usual good effects.

It is of great consequence in all plans of treatment, to render them as effectual as possible on their first employment. When the means are of an active nature, there is a necessary limit to their repetition; and where they are such as may continue to be borne without injury, their effect is impaired by their continuance. The constitution becomes accustomed to the favourable, as well as unfavourable effect of medicines, and the first impression is always the most powerful.

In having recourse to the minute doses of the alterative, therefore, we must correct as quickly as possible all the causes which counteract their operation. Besides, in many habits their long-continued use gives rise to more or less of the sedative effect, which, when it once occurs, is always more readily produced afterwards.

Of the means of relieving the tenderness of the epigastrium, local blood-letting is the most powerful; and it is of great consequence to abstract the blood as much as possible, from the most tender part.

I have had occasion to refer to that law of our frame, by which all neighbouring parts sympathize. In bleeding from the skin in the neighbourhood of a diseased organ, we take no blood directly from the vessels of that organ, but they so immediately partake of the state of the neighbouring vessels, that a few ounces of blood taken from the latter will often give greater relief in local affections, particularly those of a chronic nature, which depend more on the distention of the vessels of the part than any morbid increase of the force of circulation, than many times the quantity taken from a distant part, and which can affect the diseased part only through that medium. I have even repeatedly found, that in other cases where the tender part is one of considerable extent, the relief from the local blood-letting has been chiefly felt in its immediate vicinity; so that it has been necessary to repeat it, in order to relieve other tender parts of the same region.

Every practitioner is aware of the essential difference in the effects of blood-letting and blistering in acute cases—the one being better calculated to relieve

the distention of the vessels, the other to excite them to a due performance of their function; and in cases of great excitement the latter, without the necessary previous blood-letting to reduce the general excitement, is often even injurious, by its irritation tending to increase that excitement.

In chronic cases, where there is little or no increased excitement, these different tendencies are less apparent, but they equally exist. In proportion as the tenderness is great, local blood-letting becomes the more beneficial; and in proportion as it is trifling, and the lesion of function great, more advantage is to be expected from blistering. To this observation, however, there is one exception: local blood-letting, like all other remedies, loses its effect by frequent repetition. The sympathy by which its effects take place, active at first, becomes weakened in protracted cases; and did it still equally operate, the vessels of the part, by long-continued or frequently-repeated distention, have their contractile power impaired, and often become incapable of maintaining the healthy diameter against the force of the circulation, even when they are capable for the moment of attaining it. Thus it is that in old cases, even when the tenderness continues to be great, or great tenderness has frequently recurred, local blood-letting often proves to be of little service. Whatever be the degree of tenderness, therefore, blisters are then the appropriate remedy; and if they have not frequently been repeated, are generally in a greater or less degree successful, when local blood-letting has failed. When in long-protracted cases both fail, a permanent drain from the part is often of service. This, however, is better suited to remove the last remains of the disease, and prevent its recurrence, than to assist while the symptoms are urgent.

If we cannot by such means relieve the tenderness in the seat of the disease, the effect of the alterative will be greatly impeded; but when the tenderness is not very great, the alterative itself, by exciting the part to the due performance of its functions, tends to relieve it; and local measures will never, in the cases to which the alterative is adapted, finally subdue the tenderness without its aid.

In this effect it may, in most cases, be greatly assisted by other medicines.

Even in the most chronic cases, where the tenderness is great, it is generally accompanied by some occasional tendency to increased heat; and however rare, and of short continuance, this tendency may be, I have found that it always more or less indicates the employment of some saline medicine, and nitrate of potash I have found the best, where it does not disagree with the stomach, which in a few constitutions it is apt to do in a great degree. In almost all cases I have found its effect improved by the addition of a little mucilage, which tends to defend the stomach against its tendency to irritate. A large quantity of mucilage generally oppresses, and I have known a few who were oppressed by the smallest quantity. In one case even five drops of mucilage of acacia always produced this effect.

Saline medicines essentially aid the alterative, by more effectually subduing the inflammatory tendency. Where the recurrence of the heat is at all frequent, we shall with their aid succeed with half the quantity of mercury which is necessary without it.

The regulation of the saline medicine in such cases often requires great consideration. If more than is necessary is used, it tends to debilitate, where its constant employment is long required; and if the heats be allowed to recur, they not only essentially impede the cure, but debilitate more than the means which relieve them. I have generally found from six to twelve grains of the nitrate of potash, given with each dose of the alterative, sufficient; and in the cases which require it, by reducing, and at length for the most part preventing the recurrence of the heats, it has often essentially contributed to restore the strength; and in many cases, more than any opiate, to secure good nights; for, as I have just observed, it is in the nights, and particularly in the early parts of them, that the heats are most apt to recur, and they never fail to occasion more or less oppression and restlessness. When there is no tendency to them, if the patient be tolerably vigorous, the effects of the alterative will still be promoted by its combination with small doses of saline medicine; but where there is much debility, unless the tendency to heat be considerable, and in all cases where, as sometimes happens, there is a constant tendency

to chilliness, the latter should be wholly abstained from.

These are the cases in which stimulants and tonics are best borne and of most use. In most cases, however, light stomachic medicines, when they have no heating tendency, should be combined with the saline medicine; they do not seem to impair its alterative, and what is remarkable, unless they are of a very heating nature, or the constitution unfavourable, often very little, its cooling effect.

The use of stimulants and tonics, under the circumstances I am now speaking of, is greatly influenced by constitution; some patients bearing them a great deal better than others. Their due regulation is quite as essential as that of the refrigerants. As debilitating measures are only to be employed as far as they are necessary, strengthening means, on the contrary, are to be employed as far as this can be done without injury.

The more purely stimulating medicines, the effect of which is immediate, and in a great degree transitory, may generally be employed with little precaution wherever a sense of debility prevails, although there are some constitutions which cannot bear even these without increased heat and its usual accompaniment—a sense of oppression; and I have seen many who greatly required their cordial effect, thus wholly precluded from them; for there is nothing more injurious, in the cases I am speaking of, than a perseverance in any thing which has this effect. It never fails to increase the inflammatory, the worst tendency of such cases. In some instances, where other stimulants cannot be borne, the fetid gums (which possess a soothing effect with respect to the nerves) are borne without inconvenience, and prove highly beneficial. A combination of assafoetida and castor, I have, on the whole, found the best.

In almost all cases, except where there was much tendency to affection of the head, it has been found advantageous, whatever other means are employed, to combine with the alterative a slight anodyne; for it is always of consequence to allay irritation, the source of the inflammatory tendency, and consequently of the heat and restlessness. It is on this principle that a slight opiate often assists the refrige-

rant. Hyosciamus has appeared to answer best. It has little tendency either to obstruct the bile or impede the bowels. In some constitutions it is aperient, and even in doses of two or three grains may be used in place of other cathartics; and in irritable habits I have sometimes found it the best. When a more decided opiate has been required, the compound powder ipecacuanha has appeared, on the whole, the best; and Battley's anodyne liquor, the black drop, and the acetate of morphia, will sometimes agree with the patient, when simple opium or laudanum will not. Of these preparations, some suit one constitution and some another; and I have seen a few instances in which simple opium was the least offensive. Whatever be the opiate, it is only in very minute quantity that it is serviceable. I have known great advantage derived from a combination of hyosciamus with the fetid gums, especially where the former was aperient, which has produced a degree of composure no other means afforded.

As there are some constitutions which, in the cases I am speaking of, cannot bear the smallest doses of the most transitory stimulants, so there are others which can bear even the continued use of the most permanent; which is extremely rare.

I cannot help here remarking that one of the greatest errors (and perhaps of all errors the most frequent) in the treatment of such diseases, is making general inferences from the effect of medicines in particular cases. The great principle of distinction between the practice in acute and chronic diseases, is, that the latter are infinitely more influenced than the former by peculiarity of constitution. The causes which produce acute diseases are so powerful and sudden in their effects, that they obscure the operation of all concurrent causes; and, let the constitution of the patient be what it may, very nearly the same plan of treatment is applicable in all cases. In chronic diseases it is otherwise. The cause being less powerful, and operating less rapidly, its effects are essentially influenced by such causes. The most unobservant must perceive how much chronic diseases are influenced by situation, and particularly by change, or whatever else is capable of a powerful or permanent impression;

and yet peculiarity of constitution, for the most part the most powerful of all concurrent causes, is overlooked; and rules are laid down for the treatment of chronic diseases with the same precision as for cases of fever and inflammation. The little success which often attends the usual plans of treatment in the former, is in a great degree to be ascribed to this cause; for the same chronic disease in different constitutions, although there are general principles applicable to all cases, often in other respects require, not only different, but opposite plans of treatment. This observation is more or less applicable to all cases requiring an alterative plan.

When we find a practitioner laying down rules of treatment for chronic cases in the same way in which we are enabled to do in acute diseases, we may be assured that he has not sufficiently considered them. This, in the nature of things, is impossible. It is here as necessary, in each particular case, to determine the peculiarities of the constitution as the principles of the treatment; without which, if the practice be successful, it is merely a matter of chance. Hence a principal cause of the uncertainty which has prevailed in the treatment of such cases. With due attention to the constitution, and the circumstances in which the patient is placed, the practice may be rendered nearly as determinate as in the most acute diseases.

In the greater number of cases, what are called tonic medicines can generally be borne for two or three days without inconvenience; and even this temporary use of them, where the debility is great, is often of consequence, but if they be persevered in after they in any degree produce increased heat or restlessness, much injury accrues, as I have often witnessed, from the patient, or even the practitioner, not being aware that the injury proceeded from the tonic.

In some constitutions, where the frequent use of the tonic cannot be borne, its less frequent employment often proves serviceable. This is especially the case with the more tonic bitters, particularly after the use of the alterative. In such cases I have seen both the appetite and strength very quickly improved by moderate doses of such medicines as the compound tincture of gentian, in any of the distilled waters, taken once, or at most twice a-day, at

early hours, when its more frequent employment could not be borne. In other constitutions, even this use of any thing which deserves the name of tonic is precluded. Many attempt, by increasing the discharge from the bowels, to enable the patient to bear the tonic, and in some constitutions the object is attained; but in others, although the case be of the same nature, the attempt altogether fails—the patient is either unable to bear the free discharge, or no discharge is capable of obviating the injurious tendency of the tonic.

Of the more powerful tonics, iron is that which can be most generally borne; and the carbonate and the ammoniated tincture have appeared to me the best preparations, where the source of the disease is in the digestive organs;—but the most powerful, and therefore the best in the few cases in which it can be borne, is the bark, and the sulphate of quinine is, by many degrees, its best preparation. This is scarcely ever the case where a tendency to increased heat prevails, and very rarely when it does not; for even when the medicine shews no tendency to produce it, its continued use seldom fails to increase the restlessness and oppression.

Such are the principal observations I have to make respecting the combination of refrigerants and stimulants with the alterative, the effects of which greatly depend upon the proper management of these two classes of its assistants.

The limits of this paper do not permit me to enter on some other means which often greatly assist the alterative. For the effects of antimony in particular, I must refer to my *Treatise on Indigestion*, and that on *Organic Diseases*.

I need hardly say, that, as under all other plans of treatment, the state of the bowels requires constant attention. I have already had occasion to observe that the minute doses of mercury, although, as far as I am capable of judging, by far the most powerful means of restoring the habitual healthy action of the digestive organs, are ill fitted to carry off accumulations either in the hepatic system or the bowels; and that, on this account, during their use, the occasional employment of a more active mercurial dose is often necessary. In the commencement of the treatment it very frequently is so; but

in some habits the alterative soon begins to produce its favourable effects, and further accumulation is prevented. In others its operation is slower, and an occasional active dose is longer necessary. This, I believe, is the only circumstance which, independently of the use of tonics, renders any very active measures with respect to the bowels requisite, unless the head particularly suffers; but there is no case in which attention to their regularity is more essential.

In a large proportion of instances, however, when we are obliged to depend wholly on artificial means to excite the bowels, which is often the case, it answers better to excite them every second than every day. There seems to be always some degree of irritation, even where there is no pain, in the artificial excitement of the bowels, and it is generally a source of relief to the patient to let them rest every second day.

In some habits we find it otherwise, and their daily excitement is more beneficial. This, as just hinted, is particularly apt to be the case where the sympathetic part of the disease is determined to the head. We have seen how much the liver, by its sympathy with the source of nervous power, influences the symptoms of indigestion, and cannot be surprised to find that affections of the head are frequently complicated with those of this organ; and as the sympathy of the liver, on the other hand, with affections of the head, is equally strong, the secondary affection particularly tends to aggravate and confirm the original disease; an effect which it always more or less produces, whatever be its seat. Hence the treatment of the secondary affection is doubly important, and it often considerably modifies that of the original disease.

When the secondary disease chiefly affects the head, the most guarded use of opiates is generally precluded: even the hyosciamus is found objectionable. In such cases, neither the direct effect of the opiate, however small the dose, particularly if frequently repeated, on the brain itself, nor its effect in retarding the free action of the bowels, can be borne. These cases, for a similar reason, require a freer action of the bowels than others, and the patient generally bears it well; the derivation of the fluids from the head more than compensating for any debilitating effect.

All medical men must have observed the unusual determination of blood to the head in debilitated states of the digestive organs. This, in general, has been ascribed to the distended state of the stomach and bowels, from flatulence, and an accumulation of undigested food causing more than usual pressure on the descending aorta; and that this, in many cases, and at certain times, adds to the evil, there can be no doubt, but that it is not its principal cause, appears from its permanency and its existence where there is no morbid distention of either.

I have been at considerable pains, in the treatises above referred to, to point out the cause of this determination, and have adduced such facts as appear to me to leave no room to doubt that it arises from irritation of the digestive organs, in certain constitutions, through the medium of the nervous system, debilitating the vessels of the head; in consequence of which they suffer a slight degree of distention from the force of circulation, and thus receive a larger than due proportion of blood. This principle appears to be one of extensive influence in the phenomena of disease; for I believe it would not be difficult to shew that on it sympathetic diseases of an inflammatory nature, of whatever part, always depend; the part affected being determined by some peculiar sympathy, as in the present case, or other cause, rendering it more liable to be affected than other parts.

Inflammation consists in a debility and consequent morbid distention of the capillary vessels of the part, and excitement of other parts of the sanguiferous system, in consequence of that debility, and the great sympathy which exists between the nervous system and capillaries, by which the larger vessels of the part are excited to increased action; an effect which, if the inflammation be considerable, or seated in a vital organ, is extended to the whole sanguiferous system; the final cause of which is evidently to support the circulation in the debilitated vessels, and excite them to a due performance of their function*.

The secreting surface which, next to the bowels, most influences the progress of chronic disease, is that of the

* Introduction to my Treatise on Symptomatic Fevers, where the experiments and observations, on which these opinions are founded, are detailed.

skin; and from the state of this organ we can judge better of that of the constitution, and consequently of the measures most likely to suit it, than by any other means with which I am acquainted. While the system is under the influence of permanent failure of function, and still more of organic disease in any of the vital organs, it is usual for the skin to be much drier than in health; and it is sometimes obstinately arid, and, particularly in children, even shrivelled. It is almost uniformly dry when any considerable inflammatory tendency prevails; but in many cases, particularly where the derangement is only functional, and the inflammatory tendency inconsiderable, especially in those in whom nervous symptoms most prevail, it is in the opposite state—almost constantly bathed in perspiration. In both cases the secreting power of this organ is debilitated, the sweat in the latter case being the effect of relaxation.

In functional disease, although the symptoms may be more frequently severe when the skin is dry, I have almost uniformly found them most obstinate when it is constantly, or almost constantly, moist; and I never, indeed, saw a case of this kind in which they did not prove more or less so. We have means of almost certain success for bringing the system into a favourable state for the alterative, and assisting its effects when the obstacle is the inflammatory tendency with a dry skin; but here the alterative is generally very ill borne, being much more apt to produce the sedative effect; and in such cases we have few means which either add to its power, or assist the patient in bearing it. The whole train of anti-inflammatory, with the exception of a cautious use of local measures, is generally out of the question. Even where there is a good deal of local tenderness, the patient bears them ill, and, fortunately, the constant discharge from the skin renders them less necessary. The great characteristic of such cases is nervous debility; and yet it very often happens that strengthening means are very ill borne, the oppression they occasion adding to the sinking and debility. In general, however, patients of this description bear them better than others, in proportion as they require them more. The most beneficial are such as tend to invigorate the skin,

and restrain the discharge from it; and of these I have found the sulphuric acid the best.

When it agrees with the stomach and bowels, it often proves an important resource in such cases. I have never found it necessary to discontinue the minute mercurial doses on account of it, but, on the contrary, it has often been the means of enabling the patient to bear them; nor do I recollect any case in which it caused them to gripe, although, if they have had this effect, it is apt to increase it. The more powerful tonics, in general, are also borne better than where the skin is dry, but often fail in affording effectual relief, and, as I have just had occasion to observe, sometimes increase the sufferings.

These, and other details relating to the use of the alterative into which I enter, may appear tedious, but, except in the most favourable constitutions, which only now and then present themselves, an attention to them is essential to its success.

The effects of minute doses of mercury just mentioned, the griping, and other symptoms of irritation in the bowels, are among the most formidable obstacles we have to contend with in their employment. In the majority of cases, fortunately, they do not occur. So great is the injurious effect of this irritation, that, if it cannot be allayed, the alterative, at whatever expense, must be abandoned, for such cases will bear no serious cause of continued irritation, and in the use of opiates, we have seen, we are greatly restricted. The henbane, like the rest, is often not sufficiently powerful in any dose that is not injurious. If neither this, nor any other opiate, in very small doses, will answer the purpose, we have no resource but still lessening the dose of the alterative, having recourse to a milder preparation, or increasing the interval at which it is given; and if these means will not leave such a dose as is still capable of making some impression on the disease, the medicine must be laid aside.

In functional disease the gums are never allowed to become affected. There is no occasion for so considerable an effect of the alterative; and any thing like salivation always does harm, where all causes of irritation are particularly injurious. Many have expressed their surprise that any caution of this kind is requisite in employing such

doses as half a grain of blue pill, yet the reader has seen a case in which they produced severe salivation, where the largest doses had failed to produce any degree of this effect. The rule I follow is, to direct the patient, when the least uneasiness in eating any hard substance is felt, to discontinue the pills for one or two days, which is generally sufficient to remove it, or for whatever time is necessary for this purpose; and, although a slight degree of tenderness is often felt, I never have any trouble from this cause; for, as I have already had occasion to observe, I have never in any instance seen, in the use of such doses, the sudden salivation which sometimes supervenes when this medicine is taken in the usual way, in which case, when any cause suddenly checks its free passage out of the system by the skin, or other excretory, a large quantity is suddenly thrown on the mouth. For a similar reason the patient is much less liable to the effects of cold than under the usual modes of giving mercury, the minute doses having comparatively little effect in opening the skin. Confinement is never necessary on account of the medicine; and the only precautions I have found requisite in this respect are, not to get wet, nor to be much out at night. The foregoing circumstances, and particularly the tendency to salivation, always giving sufficient warning, afford a degree of security under their use, which is not to be obtained when larger doses are employed. The observation just made, respecting the gums, applies also to the bowels. The patient never experiences the sudden and severe affections of them which are apt to arise under the use of larger doses. The quantity of the medicine is too small to produce any considerable effect, unless its use be continued after the irritation has supervened.

It appears from all that has been said, that the injurious effects of mercury, depending on peculiarity of constitution, are of three kinds—the irritation of the alimentary canal, too great a tendency to affect the salivary glands, and a general state of irritation and debility, arising from the sedative effect sometimes of even the most minute doses; and I frankly confess, that I have never been able to discover any means of effectually obviating any one of these tendencies when they have existed in a considerable degree; and under such

circumstances I have always found it necessary very soon to lay aside the medicine. The first, we have just seen, may in some degree be obviated by opiates, but the assistance they afford, in any dose in which they can be given without injury, is never long effectual, and the treatment under their influence, unless small doses of henbane answer the purpose, which is rarely the case, never proceeds well.

On the unusual tendency to affect the salivary glands, little need be said; whether the alterative can be continued depends on the degree in which it exists, not on any means we possess of obviating it; it fortunately very rarely occurs in such a degree as greatly to interfere with the plan of treatment; and such a tendency to it as only shews itself slightly, and is removed by discontinuance of the medicine for one or two days, is generally favourable. It is a proof that it is well retained in the system, which is essential to its powerful operation as an alterative.

On the last head—the tendency to the sedative effect—which must always be watched with great care, it is necessary here to make some additional observations.

In some constitutions, we have seen the freest employment of mercury seems to have little tendency of this kind; when this is the case, and it produces neither irritation of the bowels, nor shews an unusual tendency to affect the salivary glands, we see the full powers of the medicine in restoring the vital functions, compared to which those of any other we possess hardly deserve to be mentioned. But it is almost as rare to meet with constitutions thus admirably adapted to it, as with those which wholly preclude its use. I have laid before the reader a case of acute disease, requiring the largest doses, in which the constitution was thus favourable, and shall presently have occasion to lay before him a case of the same kind, in which the minute doses alone, but for a great length of time, were required.

Chronic cases of this kind are not unfrequent, because the minute doses, in proportion to the smallness of the quantity, are less apt to produce the sedative effect, however long continued—one of their greatest advantages. In the generality of constitutions this effect is seldom observed in the commencement

of the course. In many instances, however, it sooner or later shews itself, and if not immediately attended to, always does mischief. The symptoms are a general languor and debility, often attended by a great degree of nervous irritation, the increase of which nothing can effectually prevent, if the medicine be continued in the same dose and frequency; and when it has once taken place, we have seen still smaller doses are apt to renew it.

Such strengthening medicines, it has already been observed, as the patient can bear well to a certain degree, relieve it; but I know from a very extensive experience, that they seldom wholly prevent it when it exists to any considerable degree. They rather obscure than lessen the mischief; and the medicine ceasing to be a wholesome alterative, little or no progress is made in the cure. All medicines whose sedative effect is exerted on the powers of the system alone, and in no degree on the sensibility, are pernicious as soon as this prevails over the stimulant effect, which alone is salutary; and this change will take place if the dose be either too great, or too long continued, for the particular constitution.

Nothing has served more to prevent the beneficial employment of mercury, and other powerful medicines, than the little attention which the influence of constitutions in determining their effects has obtained. The observations I have had occasion to make on the influence of peculiarity of constitution on the treatment of diseases, apply in no instance more strongly than to the effects of such medicines.

Those who have never seen the effects of minute doses of mercury, will suppose we have little reason to dread the sedative effect of such doses as half a grain of blue pill given three times a day, however long continued. My reply is, that in certain constitutions I have seen the eighth part of a grain, taken twice a day, produce such a degree of this effect, as would have risked the patient's life had it been persevered in. Can it surprise us that such should be the case, when one dose of a quarter of a grain in others is capable of producing salivation? Others may imagine that a medicine capable of such effects in such doses, must be more or less injurious in all cases; these objectors I should refer to such cases as one I

am acquainted with; in which one dish of tea has produced as bad and more rapid effects; yet nothing can be more innocent to most people. Such is the power of idiosyncrasy in determining the effects of medicines, and even articles of diet. The late Dr. Gregory had a fit of palpitation so severe as to confine him for several days, from eating the seed of an apple, and any bitter produced the same effect upon him. It is on the general effects of medicines, not on the exceptions, that our judgment of them must be formed.

I have just had occasion to observe, that when the sedative effect of mercury has once been produced, it is apt to shew itself from much smaller doses than those which first occasioned it. The patient in whom the eighth part of a grain of blue pill produced so pernicious an effect, had in the first instance for some time taken, without inconvenience, half a grain three times a-day. In this case it was necessary, occasionally, altogether to lay aside the medicine; yet, even here, it was the chief means of restoring a degree of health which no plan of treatment, under the most skilful physicians, had for more than twelve years been able to procure.

When the sedative effect appears in the employment of minute doses of mercury, one of three plans is generally found to a certain extent successful; for when this effect occurs to any considerable degree, the relief is never so speedy, and seldom so perfect, as in more favourable constitutions. The first thing which should be tried, is still to lessen the dose. If even the smallest dose which can be supposed to have any effect has still that of a sedative, when given frequently, the medicine must then either for a certain time be abandoned, or larger doses at longer intervals must be employed; which sometimes succeed, after the effect of the more frequent minute doses, where they have previously failed. When the minute doses have, after being employed for some time, produced the sedative effect, the patient generally experiences great relief on abstaining from the use of the alterative, and then only we can judge of the good it has done. In such cases, while he continues to improve under means which increase his strength and tend to mitigate the occasional symptoms, the alterative should not be resumed; but

as soon as symptoms of relapse shew themselves, it is necessary again to have recourse to it, but in still smaller doses. If the sedative effect again shews itself, the only resource, before again discontinuing it, is that just mentioned—a trial of larger doses at longer intervals.

If by none of these plans the effect of the alterative can be so modified as to suit the constitution, and make the necessary impression on the disease, in the cases I am speaking of, whether long-continued functional disease, or such organic disease as mercury can influence, we can in general do little more for the patient than attempt to support his strength and afford him temporary relief.

Such are the chief points to be attended to in the employment of minute and frequently-repeated doses of mercury in chronic cases, in which they may be regarded as the appropriate remedy. The present communication does not admit of my entering more particularly into the nature of these cases. They comprehend more than two-thirds of all the chronic diseases to which we are subject, and are characterized by the digestive organs having more or less share either in the causes which have produced, or those which prolong them. One of these cases, which I have frequently seen prove fatal, I shall briefly notice; because, as far as I know, it has been overlooked by writers, or confounded with other diseases.

It consists in a languid inflammatory affection of the brain, if it deserves that name, and is, as far as my experience of it goes, essentially influenced by no plan of treatment without the co-operation of the minute mercurial doses. It betrays itself by a derangement of function, not remarkable for its severity, but its universality and its obstinacy; and assumes very much the form of common nervous complaints produced by irritation of the digestive organs: but it is more steady in its course, and influences the functions more generally. The only inflammatory indication is a certain degree of tightness of pulse, and an occasional recurrence of feverish heats, except (as not unfrequently happens) the temperature of the body is uniformly below the healthy standard. Yet, even then, traces of inflammation of the brain, or its membranes, are no less found after death which is occasion-

ed by organic disease of this organ, the consequence of its inflammatory state, or by languid inflammation and similar change of structure in one or more of the other vital organs, excited by the long-continued irritation of the brain. I have, in a treatise *on the Preservation of Health, and particularly the Prevention of Organic Diseases*, entered at considerable length into the diagnosis of this disease, and its plan of treatment. I need hardly say that the liver is always more or less affected in it; and where it chiefly arises from obstinate debility and irritation of the digestive organs, which appears to be its most frequent source, the minute and frequently-repeated doses of mercury, with such other means as the more urgent symptoms require, constitute the only plan of treatment which I have found, not only at all successful, but capable of making any decided impression on it. I also beg leave to refer the reader to the same treatise for the account of a disease of the lungs, which appears at advanced periods of life, of very frequent occurrence; respecting the treatment of which, after it is decidedly established, I would make the same observations.

I shall close this part of the subject by cursorily relating a case exhibiting the effects of, and mode of regulating, the minute doses of mercury in a favourable constitution, where an unusual continuance of the treatment was required, but I had none of the difficulties above stated to contend with.

An officer, between thirty and forty years of age, returned from India in a state of great debility. His countenance was sallow, and at once informed the experienced eye that he laboured under organic disease. The liver was much enlarged and indurated; he was subject to severe inflammatory attacks in it and the neighbouring parts, which greatly increased his debility, and frequently brought him into immediate danger; and the whole of his state was such as is supposed rarely to admit of a perfect restoration to health. The temporary attacks were relieved by local blood-letting and such means as allayed the pain and quickly restored a freer secretion of bile; and in the intervals he was desired to take half a grain of blue pill and a grain of the extract of henbane, three times a-day, with such medicines as allayed the tendency to

fever. The most nutritious diet, of easy digestion, which his state admitted of, was enjoined, and he was desired to be in the open air as much as he could without any degree of fatigue or the risk of taking cold; and, as his strength improved, to make walking his principal exercise. In a short time he experienced a sensible improvement in his health, the severity of the inflammatory attacks abated, and in the space of some months ceased to return. He could now move about with more ease, although the enlargement of the liver was still considerable; and, after being made acquainted with the circumstances necessary to be attended to, he was not prevented from going to the country, and to the Continent, to which his affairs called him.

His recovery gradually advancing, he repeatedly thought himself well enough, according to the directions I had given him, to permit the alterative to be discontinued, but was constantly obliged to return to its use, in consequence of a return of the symptoms. I saw him from time to time, without finding any reason to change his plan of treatment, assuring him that the time would come when the means of cure might be laid aside without a return of the disease, and that it only required the slight remains of his disease to be subdued, and the habit of health maintained by the medicines for a certain length of time, in order to render it permanent without their aid. It was now six or eight months from the commencement of the treatment, and hardly any enlargement of the liver could be perceived; and at each interval at which I saw him the improvement, both of his looks and strength, was apparent. I still advised him, from time to time, to try how far the alterative could be laid aside, but to return to it as soon as he perceived the least threatening of a renewal of his symptoms.

At the end of more than two years from the time he had begun the employment of it, during which he was uniformly recovering both his strength and healthy appearance, he found my prediction verified. He no longer required the use of medicine. All enlargement of the liver had disappeared, and he had in all respects regained both the appearance and habits of health. He returned to the service, but not to India; and although three or four

years have now elapsed, he has experienced no symptom of his disease, and has, within the last twelvemonth, gone abroad in a high official situation.

Of the effects of minute doses of Mercury in acute cases.

I am now to lay before the reader such observations as my experience has afforded respecting the effects of minute and frequently repeated doses of mercury in acute cases. It is evident, from what has been said, that they cannot supply the place of the more active doses of this medicine, which are often employed with such advantage in their early stages, with a view to excite the torpid liver, relieve its loaded vessels, and cause a general determination of the fluids downwards, where, from the excited state of the circulation, there is too great a determination to the head. While these and other means of great and immediate effect are to any considerable degree necessary, the minute doses have generally no sensible operation, and therefore no place; but in a large proportion of acute diseases, after they are to a certain degree mitigated, the symptoms are prolonged by the obstinacy of local affections, which have either produced, or been produced by, the state of general excitement. The liver, from its extensive sympathies, often shares in the original cause; and still more frequently the state of this organ, induced by the disease, tends to prolong or renew it, and the patient thus falls into a state of less acute but obstinate suffering.

The cases most apt to degenerate into such a state, are those of protracted fever and affections of the organs which most sympathise with the liver—particularly the brain and lungs. Every physician must have met with cases of fever which neither subsided as usual, nor were followed, as happens in favourable cases, by a good appetite and a more or less rapid recovery of strength. Either the febrile symptoms continue to recur, or the patient remains languid and dispirited, and what are called the remains of the disease, hang about him. In by far the majority of such cases, it will be found that more or less permanent functional disorder of the liver has been established; and although, from the chronic nature of this affection, it has not prevented the subsiding of the

more urgent symptoms, it supports a constant tendency to their renewal; and where it is not sufficient to produce this effect, it frequently prevents the recovery of the appetite, and always of the strength and spirits.

The state of the liver can only be with certainty ascertained by an examination of the regions of this organ, and of the duodenum, where some tenderness or fulness will be discovered, if the cause which impedes the recovery exists in the liver, which it will be found to do in at least nineteen such cases out of twenty.

Every one will agree, that, under such circumstances, all vigorous measures of a debilitating nature are out of the question; but it is not at all uncommon to see them aggravated by the attempt of the practitioner to restore the strength by powerful tonics, by which both the tendency to a recurrence of the fever and the oppression and restlessness are increased; and I have seen many such instances, in which the patient, guided by the effects of these means, has refused to pursue them. In the most favourable cases they tend only to support the patient under his disease, not to relieve it, and, if their effects on the liver be not counteracted by the efforts of the constitution itself, never fail eventually to increase the mischief. The only effectual means are those which restore this organ, which is only to be here attempted by such as suit the debilitated state of the patient.

In many instances it may be effected by a few grains of the blue pill, taken every second night, and gently carried off by the bowels on the succeeding morning, combined with means which prevent the return of the febrile symptoms, and such stimulants as the patient can bear without any tendency of this kind, or any increase of the restlessness and oppression. In the more obstinate cases such means fail; and then I know of none which will succeed except the substitution of the minute and frequently repeated, for the occasional larger mercurial doses, combined with the other means just mentioned, and regulated on the principles I have explained. The existence of such a case as that I am describing is, I believe, always the effect of the state of the liver having been overlooked in the course of the fever, and the frequency

of such cases points out in a striking manner the necessity of attending to the state of this organ in all diseases of prolonged excitement—a necessity still more strikingly exemplified by what I am about to say of those cases in which such excitement is supported by a local cause.

As the blood is returned from the brain by canals which cannot partake of the generally increased excitement of the sanguiferous system, such excitement is necessarily accompanied by a tendency to an accumulation of blood in the vessels of this organ, which, within certain limits for the time increasing its powers, appears to be a provision of Nature, for bestowing on us greater than usual nervous energy at the times it is most called for, as under the impression of the exciting passions, or in running, wrestling, &c. Hence in all diseases of increased excitement more or less tendency to accumulation of blood in the head is a constant attendant. To this we must refer the pain, and many other affections of the head, which are so apt to attend fever.

The tendency to these subsides, of course, as the excitement of the sanguiferous system abates, unless the brain or its vessels have sustained some more permanent injury during the period of excitement. It seems frequently to happen, however, especially when the excitement is severe and long continued, that even where the due action of the brain itself is restored, the organs, which most sympathise with it, suffer more permanent derangement of function. It seems to be in this way, as well as from their vessels partaking of the state of general excitement, that various local derangements arise in fever, affecting the parts which happen to be most liable to disease.

No organ is so liable to suffer in this way as the liver, and in some climates this liability is so great, that its affections become the leading feature in almost all febrile diseases; and even in such climates as our own, functional derangement of this organ is the most frequent of all the local affections which supervene in fever. Such appears to be the origin of the cases I have just referred to, the hepatic affection remaining after the fever has subsided.

It is when it becomes evident in the course of the fever, and when it does so, it always aggravates and prolongs it,

and has resisted occasional active doses of mercury; that I have found the minute doses of this medicine, in conjunction with the usual means, so beneficial. The amelioration of the symptoms, and a more favourable course of the whole disease, may, under such circumstances, be with confidence expected from them, particularly when combined with local measures in the neighbourhood of the liver; and I have never seen an instance in which they in any degree tended to increase the febrile symptoms. By their means, with or without the continued aid of occasional more active mercurial doses, according to circumstances, the hepatic affection may always be controlled and brought to terminate with the fever; so that such cases become as manageable, and as little liable to leave remains behind them, as when no hepatic affection has attended.

In acute cases, I generally give the mercurial every six instead of eight hours. In these, especially where the excitement is still considerable, it rarely shews any tendency to affect the mouth, and, what is remarkable, very rarely to produce any degree of the sedative effect to which, in consequence of the more powerful impression of the disease, the constitution is for the time very little liable. It very seldom, indeed, produces any sensible effect but that of a gradual mitigation of the symptoms.

Towards the decline of fever, where such an affection of the liver has supervened, the fever often seems to be supported by this cause alone; and even in cases where it has proved most obstinate, will immediately begin to abate on the system being brought gently under the influence of the alterative.

There is another class of acute diseases in which the minute mercurial doses are of great use;—I allude to acute inflammation of the liver itself, or of those organs which most sympathise with it—particularly the brain and lungs.

Their benefit in acute *hepatitis* is not confined to the more advanced stages; they are of essential use as soon as the canal is effectually cleared by more powerful mercurials, combined with proper purgatives. When larger doses are given with any other view than the evacuations they occasion, they tend to increase the inflammatory symptoms; yet, in this case, the constitutional as

well as the local effects of the mercurial are required, and by the minute doses it is obtained, as far as I have observed, without any tendency of this kind even in the most inflammatory cases.

When the affection of the liver is secondary, the local operation of the larger doses is often sufficient to restore its function. It is only when it degenerates more or less into a chronic state that the constitutional effect of the medicine is required; but in the case before us, we want all the aids which the great influence of mercury on the part here primarily affected is capable of affording; and this is the more necessary because the disease is apt to assume more or less of a chronic form, and become more obstinate in proportion as it does so; the speedy relief of which will depend on the degree in which the system is prepared to meet it. We have seen in the last case, detailed above, that in proportion as the system was brought under the influence of the minute doses, the attacks of *hepatitis* which threatened the patient's life declined, and at length were wholly prevented.

In inflammation of the brain, the function of the liver is always more or less affected, and this organ not unfrequently partakes of the inflammation; and as its affection has its cause in the powerful sympathy which exists between these organs, it cannot fail to influence the original disease. Thus it is that, in inflammation of the brain, the state of the liver always demands attention—is often the means of supporting and renewing the inflammatory affection of the former organ; and when, as frequently happens, habitual derangement of function in the liver has been originally the means of determining the inflammation to the brain, the treatment of the hepatic affection, after the more severe inflammatory symptoms are relieved by proper evacuations, constitutes the most important part of the means of cure.

We have a familiar instance of the effects on the brain of continued irritation of the digestive organs in the internal water of the head in children, which, in nineteen cases in twenty—I may say, indeed, in all which are not the consequence of mechanical injury of the brain—arises from this cause, and which, without the aid of mercury, may, even in its earlier stages, be regarded as very nearly an incurable disease, so unsuc-

cessful are all our other means without it.

There is a peculiarity in the effects of mercury in children. In them, calomel is generally its best preparation, and the frequent repetition of minute doses has much less sanative effect in them than in adults. The same principle, however, holds in the treatment of their diseases. Except where they require the immediate and powerful effects of the medicine, comparatively small doses at comparatively short intervals is the most effectual mode of employing it. I have found half a grain of calomel, given at the interval of eight or twelve hours in the more urgent, and twenty-four or forty-eight hours in the less urgent cases, combined with more or less rhubarb, or some other cathartic, according to the state of the bowels, the best alterative in them; for here it should always be made to act more or less as a purgative. Its local operation seems to be that which best suits the constitution of children.

Advantage is rarely obtained, but often great distress and even danger, from the mercury affecting the mouth, particularly in very young children, which every practitioner knows is, fortunately, very little apt to happen. Whether given in large or small doses, it must be given as a purgative only, except in a very few acute cases where life is immediately threatened, and the immediate and most powerful effect of the medicine is required; and even here the bowels must be kept in the most open state, which the large doses, sometimes necessary even at short intervals, seldom fail to do. This practice, which is, I believe, often carried farther than is either necessary or proper, is in general borne far better than we should *a priori* expect. The free secretion of mucus in the bowels of children, seems both to defend them against the irritation of the calomel, and to prevent its absorption.

In the less acute cases, it is surprising from what states infants may be restored by the alterative use of calomel, given in the way just mentioned. When the skin has become yellow and shrivelled, and hung loosely round the emaciated limbs, in which there remained scarce a trace of muscle, the wrinkled countenance assuming an expression of extreme old age—a remarkable feature in the worst stage of

certain chronic diseases of infants—while the distended and in many parts indurated abdomen has appeared to have drawn to itself almost all the remaining substance of the enfeebled frame, the change effected by such means in a favourable habit—for we cannot always expect such a result—has surprised all who witnessed it. As the abdomen decreased and became of a natural softness, the limbs have become plump, and the countenance of a healthy colour and natural expression.

From all that has been said of the influence of the brain in the vital functions, and consequently the influence of their organs on it, and from what was observed above respecting its chronic inflammatory affections, the reader will perceive how essential the employment of mercury, given in the way adapted to the state of the case, and particularly that of the attending hepatic affection, is in all long-continued diseases of this organ. Some affection of the liver always attends in such cases, and sometimes, as we have seen happens in stomach affections, even where the state of this organ has had no share in producing that of the brain, the latter is both supported and aggravated by it, so that the cure of the sympathetic not only becomes essential to that of the original disease, but often the most important part of the treatment.

From the great extent of the sympathies of the liver, many of the foregoing observations apply to a great variety of other cases. It would swell the present paper to too great a size, were I to attempt even cursorily to consider all; I shall therefore close it with a few, and but a few, observations on affections of the heart and lungs.

Next to the brain, there is no organ which so powerfully sympathises with the liver as the lungs. It is now above five-and-twenty years since I first, in my *Treatise on Symptomatic Fevers*, endeavoured to distinguish that species of pulmonary consumption which arises from affections of the liver, and to point out its appropriate treatment. A few years afterwards I presented to the Medico-Chirurgical Society a paper on this subject, which appeared in their Transactions, and which about ten years ago was re-published in my *Treatise on Indigestion*; and in a *Treatise on Organic Diseases*, published in 1830, I have en-

tered into the subject more generally, and pointed out other affections of the lungs which often have the same origin.

Although it is much less common for disease to spread from the lungs to the liver than *vice versâ*, yet this not unfrequently happens, and the affection of the liver then re-acting on the lungs, never fails to add to the obstinacy of the original affection, and to increase its tendency to return; so that, as we have seen with respect to the stomach and brain, the treatment of the sympathetic affection, in protracted cases, sometimes becomes the most essential, recovery being prevented by it alone; for, from the various causes which have been mentioned, wherever affections of the liver supervene, they are apt to become the most obstinate part of the disease. On this part of the subject I must also decline further to enter, the present paper having already extended beyond the limits I had assigned to it; I shall, therefore, only observe, that it affords many proofs illustrating what has been said of the state of the liver in diseases which, at first view, appear to have little relation to it. The liver being, on the one hand, an organ of little sensibility, and on the other of the most extensive sympathies, the reader will easily perceive how readily, in complicated cases, it may essentially influence the disease, and yet escape the attention of a practitioner who is not sufficiently aware of its peculiarities. I need hardly add, that in all cases in which it is concerned, whether primarily or secondarily, the medicine which so powerfully controls it forms a more or less essential part of the treatment, not only as far as relates to the speedy or protracted recovery, but often to the favourable or fatal termination.

The sympathy of the heart with the stomach is greater than with the liver, as many of the phenomena of disease evince; but such is the immediate sympathy of the stomach and liver, that, in many cases, the heart is almost as much influenced by the state of the latter as if its sympathy with this organ were more direct; and as we have no means of restoring habitual debility of the stomach without restoring the function of the liver, the treatment is pretty nearly the same in protracted functional disease of the heart as if it more immediately depended on the state of that organ.

It is of the first importance in the treatment of affections of the heart to inquire how far its organic diseases can be traced to long-continued functional derangement, and what share affections of the digestive organs have in supporting that derangement. These questions I have considered in a treatise just mentioned, to which I must refer the reader. Much of what is there said is strikingly illustrated by the case of Mr. Hobson, of Mary-le-bone Street, a well-known and highly respected member of our profession, related by himself in the number of this journal for the 22d of October, 1831, page 79. This case is equally illustrative of the power of sympathy in determining the phenomena of disease, and that of the minute and frequently repeated doses of mercury in controlling them.

Mr. Hobson had for thirty-four years laboured under symptoms of diseased heart, to which all the powers of his constitution were yielding. He had become pale and œdematous, with habitually oppressed breathing, which in a great degree incapacitated him for all active duties, and rendered him subject to frequent attacks that immediately threatened his life. Being a medical practitioner of the metropolis, he of course had the advice of many, and those the most skilful, and was regarded by all as labouring under confirmed organic disease of the heart, so that no attempt was made but with a view to present relief, and he had not for some years left his house without his name and address in his hat, fearing that he might not return alive. I was led from many circumstances, notwithstanding the severity and long-continuance of the symptoms, to regard the affection of the heart as chiefly sympathetic. The function of the liver was always more or less, and occasionally, much disordered; and several of the symptoms led me to believe that if organic disease of the heart did exist, it was not in sufficient extent to cause the effects I witnessed.

For many months he steadily pursued the plan of treatment which I have laid before the reader, taking half a grain of blue pill three times a-day, combined with such other means as tended to restore the digestive organs, and relieve the occasional more severe attacks. This plan had not been continued for many weeks before symptoms of amendment appeared, and in the course of a

twelvemonth I had the satisfaction to see him relieved from every symptom of diseased heart. His colour became healthy; the dropsical swellings left him, and he was restored both to the appearance and functions of health. He was so impressed with the plan of treatment which had been pursued that he published the account of his case to which I have just referred, and which, as he was in every respect so well qualified, will make a stronger impression on the reader than any account of it I could give.

I could mention several similar cases, though of less continuance, in one of which the symptoms of organic disease of the heart were quite as strongly marked, and which, after a continuance of many years, yielded as perfectly to the same means.

Enough has now been said to illustrate the two great objects I had in view in the present paper. The extensive influence of sympathy in the phenomena, and consequently the necessity of never losing sight of it in the treatment of diseases; and the power of mercury in influencing their progress, arising from its influence on the extreme parts of the sanguiferous and nervous systems, on which the functions of life immediately depend, and its controlling the affections of the organ whose sympathies are at once the most extensive and the most powerful.

It would not be difficult to shew, that on the power of sympathy the phenomena of general diseases wholly depend; and all internal local diseases may be so simulated by their corresponding sympathetic affections, that there is often great difficulty in distinguishing them—a difficulty not a little increased by the constant tendency of the sympathetic to change into the real disease, which frequently, in regulating the treatment of the different stages, renders morbid dissection itself, in general our surest guide, fallacious.

The effects of sympathy, which under all circumstances is constantly operating in our frame, have never been disregarded by physicians; and the powers of mercury have in many respects been well understood by them. It is not difficult to prove, however, that the former have not sufficiently commanded their attention, nor have they sufficiently investigated the latter.

Even in the present state of medicine in this country, one of the most frequent and fatal errors is the treatment of the sympathetic, which in a great proportion of cases becomes the most prominent, disease, without the necessary attention to the original affection, obscured, but not removed by it; for it is in vain to attempt to obviate a consequence, if the cause be still allowed to operate, a far less degree of which will support than that which originally caused the train of symptoms to which the attention of the practitioner is too often unfortunately confined.

The principles on which mercury operates have, as far as I am capable of judging, been in several respects misunderstood, and consequently the means by which we may as much as possible obtain the good and avoid the bad effects of this medicine, in several ways mistaken. The attainment of these objects the reader must have perceived, if I have been so fortunate as to carry him along with me, in a great measure depends on a correct knowledge of the laws of sympathy. Without this knowledge, however well the operation of mercury may be understood, its correct application is impossible.

No practitioner can avoid seeing, under certain circumstances, the beneficial effects of this medicine, employed, either as an active and present, or as an eventual and more slowly operating means of cure. These are often apparent to the least observant, but to distinguish all the cases adapted to its employment, and to regulate it in the most beneficial manner, require a more extensive knowledge of the nature of disease, and the effects of the medicine, than at first view appears. No one can be more sensible than myself how much remains to be done in these subjects. All I have attempted is to give the result of my own experience relating to them, and point out what appears to me to be the proper mode of investigating them; and particularly to press on the reader that while our attention is confined to the more prominent symptoms of disease, and the more immediate effects of the medicine; we may do much mischief by so active a means, and we shall certainly lose much of the advantages it is capable of bestowing.

Cavendish-Square,
Feb. 1832.

