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OF

THERAPEUTICS

A LECTURE

INTRODUCTORY TO A COURSE ON MATERIA MEDICA AND DIETETICS.

BY

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ON THE

POSITION AND PROSPECTS OF THERAPEUTICS.

A COURSE of lectures on Materia Medica, in its widest sense, should include an account of all the means and appliances which are employed to prevent, cure, or alleviate disease. It may be divided into Hygiene, or the means of preserving the health of communities and individuals, and Therapeutics, or the means of curing or alleviating disease. But this subject is so wide, that it would be impossible in a single course to consider all its departments, and on this account Materia Medica, in its ordinary sense, is held to include only certain parts of the great subject. Thus, in most courses, the whole department of Hygiene, though of great importance, is entirely omitted, or very cursorily considered, and from Therapeutics are subtracted all surgical operations,

which, as tending to cure disease, should theoretically form a part of it. Hence, gentlemen, the present course includes merely the non-surgical means employed to cure or alleviate disease. Now, these means are of various kinds, viz. medicines, ordinarily so called, diet, and climate; and we shall consider each in succession. As the most important and extensive, the medicinal agents will claim the amplest notice, and to them a great part of our time must be devoted; but the principles of dietetics and of climatology will demand a share of our attention, for you will find both, and especially the former, of great moment in the treatment of disease.

We shall first consider the different effects of medicines, and explain, so far as we can, their mode of action, and shall then take up the individual drugs, and describe their sources, nature, and properties.

In commencing, then, such a course of Materia Medica, the first question we have to consider is, whether the science and art which is to be the subject of our studies is one of real practical value. Scepticism upon this point has become so general with the

profession, as well as with the public, that I feel it most essential to devote some time to its consideration. It is scarcely necessary to lead evidence that this scepticism exists, when we see the number of otherwise intelligent people who are induced to confide in the absurdities of homœopathy, and in the numerous so-called specifics, which, according to their advertisements, cure all manner of diseases, for this could not be the case were there not a deep-seated want of confidence in the orthodox system of therapeutics. That this doubt exists to a great extent among minds of the highest class, both practical and theoretical, cannot be denied. Witness, in proof, the opinion of the great Napoleon expressed to his physicians during his long last illness—"Your disgusting preparations," said he, "are good for nothing; medicine is a collection of blind prescriptions, which destroy the poor, sometimes succeed with the rich, but whose results are more injurious than useful to humanity." Witness, too, the profound satire of Goethe, for he says in that withering disquisition on all human knowledge, in the first part of Faust:—

"The spirit of medicine is easy to be grasped;
You study through the great and little world

To let things go in the end
As pleases God.
'Tis vain that you through every science sweep,
For each man learns only what he can,
But he who strikes in in the nick of time
That is the proper man.
You are a pretty well built fellow,
And won't want much in confidence.
Man, if you but trust in yourself,
All other men will trust you too."

Such were the conclusions arrived at by two of the greatest men of modern times, and by many besides them. Was their conclusion correct? Is the art of medicine, so far as concerns treatment, nothing? Are all our vaunted remedies powerless? To all these questions I reply most unhesitatingly, no. Let us briefly consider the reasons for my answer.

First, then, I claim for medicine that it prevents disease. I do not here take into account the banishment of the plague from our country, nor the remarkable diminution in the frequency and severity of dysentery, for these are probably the results of better hygienic arrangements, nor the immense saving of life which vaccination is daily accomplishing, having rendered small-pox comparatively a mild disease, for

this is not attained by the use of drugs. But the disappearance of ague from the lists of fatal diseases is in part, at least, due to the advance of therapeutics, and the freedom from scurvy enjoyed by our fleets is a direct triumph of our art. In the one case, the administration of bark or quinine does sometimes prevent the occurence of ague in individuals exposed to malarious influences, and lemon juice effectually prevents the occurrence of scurvy. It is difficult for us now-a-days to appreciate the value of these benefits, for we know so little from our own observation of the ravages of these diseases. But if we recal the fact that about two hundred years ago they ranked among the six most fatal maladies, and that now a death from either is a rare event—when we think of fleets more than decimated with scurvy, and of kings dying of the ague—we learn something of the value of the services of therapeutics in these directions.

But besides preventing, medicine is of value because it cures, disease. I use the word cure in its strictest sense; I do not mean that it merely facilitates or hastens recovery, that is to say, nature's process of removing disease, but that it absolutely

checks the morbid action, and restores the sick person to health. Now, it is in very few diseases that we have this power, and very few remedies that produce this effect. Still there are some. Let me refer to a few instances. The two medicines to which we have referred as preventers of disease, are conspicuous also as curative agents. Thus bark and its most active principle quinine are almost unfailing remedies for ague and other periodic diseases; and lemon juice very rarely fails to cure scurvy. But besides these, we can point to the action of iodine in goitre, of iodide of potassium in periosteal or other swellings on the surface of bone, and to the action of iron in chlorotic anæmia. Again, in that most troublesome disease, granular inflammation of the eyelids, the regular application of caustics will suffice to produce a cure which almost never occurs when the case is left to nature. Medicine, too, sometimes saves life in a direct way when poisons have been taken into the stomach, but not absorbed in quantity sufficient to prove fatal. A powerful emetic rids the stomach of the injurious substance, and the patient is saved.

But descending from this high platform, on which I confess medicine has comparatively few

triumphs to record, I claim for therapeutics that it is eminently useful in assisting nature in her curative efforts. No man can be more satisfied than I am of the influence of nature, as the great curer of disease. At the same time, I am satisfied of the truth—that art can in many cases afford her efficient assistance. Let me adduce a few examples. A man in good health is, while heated, exposed to a cold temperature, and the function of the skin, as an excretor of fluid, is arrested. In consequence of this, additional work is thrown upon the kidneys—they are unequal to the task—and become inflamed. The patient and his friends are alarmed by the appearance of dropsy. The physician looks on with anxiety, knowing from this sign that injurious matters are accumulating in the blood. The curative power of nature now aims at re-establishing two functions—those of the skin and of the kidneys, but without success. The patient gets gradually worse, matters which should have been removed accumulate in the system, and being out of place there, cause mischief. But the intelligent physician, observing what are nature's aims, seeks to assist her. By external means, such as vapour and hot air baths, or by the adminis-

tration of internal remedies, or by both, he strives to re-establish the arrested perspiratory function, and thereby to relieve the congested kidneys ; or he may aim at this latter result by more direct external means ; or he may seek to establish a freer flow of the renal secretion. He may take up other indications of nature, and seek to remove the injurious substances which are accumulating in the system, by stimulating to an unusual activity other excretory organs. And when once the physician has succeeded in establishing an increased activity of any of these functions nature avails herself of the outlet. Here we see a pure and undeniable instance of the aid which art can sometimes give to nature.

Again, to take a simpler instance, we find a patient suffering from the presence of irritating matters in the primæ viæ; nature is seeking to get rid of them, but her power can accomplish it but slowly; art steps in and accomplishes the task by the simplest means, and the patient is well. Or, on the other hand, the primæ viæ are in a state of chronic irritation, and are causing much discomfort to the patient; we administer a few doses of a sedative and astringent medicine, and the patient is relieved.

Again, take the case of a patient suffering from a severe and exhausting fever. Nature is busied with all her might struggling with the poison that has entered the system. No power remains in the body for absorbing nutriment for its support. Scarcely can nature succeed in throwing off the enemy, or, exhausted, she is about to sink in the effort, when the physician, with a wisely administered stimulant, strengthens her power and turns the tide of victory in her favour.

Again, we are constantly meeting with young creatures of weakly constitutions, whose pale countenances and swollen glands tell of a low type of health. There is a want of stamina in their system; we pour in oil and wine. Increased vigour and returning health testify that we have supplied to nature what she stood in need of, and we have restored the patient in the meantime, and given him a greater capacity of resisting disease.

But the same strumous constitution may have passed into a yet graver condition. That dreaded malady consumption may have commenced its work upon the lungs, and the disease may be gradually progressing when the patient comes under our care. We

provide him with an abundant and nutritious diet, and administer to him cod-liver oil—and we often observe a speedy amendment, sometimes even a return of vigour such as the patient has not known before. The statistics of some of the chief cities of North America have shewn, according to Dr. Wood of Philadelphia, since the introduction of cod-liver oil, a diminution of mortality from 14.2 to 12 per cent. It may be doubted whether this was merely a result of the use of this remedy, but in the opinion of the very intelligent physician who makes the statement, it affords the leading explanation of the improvement; and whether this be so or no, the value of the remedy is beyond a doubt, and its effects are due to its affording a needed nutrition in an easily assimilable form. Here again, therefore, the enlightened physician aids nature, and entitles his art to a share of the credit of the cure.

I am quite aware, gentlemen, that you may object to my statements, saying that in all the instances I have specified, I have claimed for art what nature alone had effected; that though the medicine was given, the effect was due, not to it, but to an effort of nature. It is somewhat difficult to deal with such an objection, coming especially, as I assume it to do, from

those only commencing their therapeutical studies, but in the meantime I offer you two considerations. The first is, as to what experience has taught the profession, the second, what your experience will afterwards teach you.

Numerous observations have established the fact that different drugs produce upon the healthy system effects precisely analogous to those which we have ascribed to them in disease. Thus no one can deny that the hot air or the vapour bath produces copious perspiration, and that the same effect is produced by certain internal remedies. And all are familiar with the action, in the healthy body, of cod-liver oil, of sedatives, and of alcoholic stimulants. And as to your own experience, gentlemen, that is yet to come. When you observe the practice of others, or treat cases on your own responsibility, you will often be able to satisfy yourselves that you can favourably modify morbid processes by the administration of medicines.

But, gentlemen, I claim for medicine a further merit, that it relieves suffering, and this is a merit which we cannot afford to despise. I know few positions more trying for a physician, than when he is

obliged to say to his patient that he can afford him no relief, that he must leave him to suffer on in unabated pain. Conceive, on the other hand, the case of one who, from some ailment, spends the night in a vain straining after sleep, harassed perhaps by constant pain, or kept awake by an incessant cough; this patient, after nights of sleepless suffering, and days rendered miserable by the want of the night's repose, receives from his physician some simple sedative, sleeps the whole night through, and awakes in the morning with a world of gratitude to the medicine which has procured him immunity from suffering. Or again, a patient has some inflammation of the skin, or a painful ulcer, and his life is embittered by the irritation it produces—the physician applies a local sedative—the patient feels himself a new man, and blesses the art which has given him such relief. Who has not seen the wretched victim of cancer enabled to forget for a while his suffering under the influence of a well-timed narcotic? or a poor consumptive lifted for a time above his weakness by a simple stimulant?

I need not multiply examples of the relief which medicine gives. Your daily visits to the surgical

theatre teach you how the administration of a drug—a single dose of it—can save the patient from a mortal agony, and reduce immensely the shock which the system must sustain from any severe operation. They teach you, too, how this drug, reducing the patient to the stillness of death, may save his life by enabling the surgeon, by a delicate dissection, skilfully to avoid vitally important parts. This science which some men despise has given us chloroform. Need I say more to convince you that it is not altogether worthless?

Thus far I have endeavoured to shew that our science of therapeutics is of value to our patients, but I claim for it the merit of being useful in teaching us the nature of disease. The facts that the power of an individual remedy varies in different cases of the same disease, and that an individual disease may be relieved in different cases by different remedies, are susceptible of two explanations. One is, that as no remedy is uniformly serviceable, and as the same disease may disappear under a variety of remedies, art has nothing to do with the cure—it is entirely due to nature. Another view is, that the so-called individual disease in reality consists of a number of diffe-

rent diseases, each of which has its appropriate plan of treatment.

Thus, in diabetes mellitus, good results have been obtained by the most opposite plans of treatment. Some cases have been benefited by feeding with sugar, while others have been injured thereby, and on the contrary benefited by abstinence, not only from sugar, but from any food capable of being converted into it. Now, how can these facts be explained, unless on the hypothesis that there are more forms than one of diabetes? And to this opinion I think both pathologists and clinical observers are coming. Or, to take an instance in which the differentiation of the diseases has already been accomplished—it was observed by physicians that some cases of paraplegia improved under blisters, while others improved under ergot of rye, and yet others under strychnia—each remedy failing in the cases in which the others proved successful. Brown Sequard's observations have led to a tolerably clear distinction of several forms, and to some suggestions as to the remedies which may be useful in each. Had any one taken up the indications afforded by the different effects of the different remedies, he might have unravelled this

question from the one end which Brown Sequard has, in so far, done from the other. In many diseases which we now deem so many individual ailments, we observe corresponding facts, let us endeavour to take up their indications, and we may arrive at some most interesting, important, and practical results. Hippocrates embodies this truth in one of his aphorisms—for he says, "Naturam morborum curationes ostendunt."

From these considerations, gentlemen, I think you must concur with me that the science of therapeutics is of more practical value than many suppose. We have seen how it prevents some diseases, how in others it affords us the means of absolute cure, how in many others it enables us to assist nature in effecting recovery, how by it we can relieve many of the thousand ills that flesh is heir to, and how it affords to us indications of the nature of disease, thus leading us to a more perfect knowledge of its nature and treatment.

But like all other popular errors, so wide-spread a distrust in therapeutics cannot exist without some foundation in fact, and the clear determination of this ground will, I think, be of essential value to us at the

present stage of our inquiry. It will enable us, fully appreciating these grounds, to avoid, so far as possible, giving any occasion for want of confidence in our art.

What, then, are the grounds of this distrust? The first, and by far the most important, is our real want of power. It is best to put it in its broadest and fullest light, that when you come to treat disease you may not be disappointed, and become utterly sceptical; therefore, gentlemen, I assure you that in a vast number of cases medicines are powerless. In many a fatal result ensues in despite of medicine, and in many others recovery takes place by nature's efforts, altogether independently of the remedies employed. Of the former, I presume you have no doubt, and the truth of the latter is proved from a variety of sources which have been indicated by the late Sir John Forbes in his excellent work on "Nature and Art in the cure of Disease." The evidence is derived principally from the following sources—from the history of ancient nations, and of uncivilized peoples in our own day, who seem to have an average mortality from disease very little exceeding our own, though with them the practice of medicine does not or did not exist; from

the history of individuals or bodies of men who have passed through disease beyond the reach of medical interference, as in the case of seamen taken ill during a long voyage in vessels not provided with a surgeon; from the results of the expectant mode of treatment in its various degrees; from the published records of cases treated successfully on the most opposite plans; from the successes attained, and so-called cures effected, by many quack nostrums; and lastly, from the practice of homœopathy. One and all of these has been followed by an amount of success not very much behind that attained by ordinary medicine, demonstrating that in all there has been some particular power at work determining the successes and the failures irrespective of the treatment; and what power is this but the vis medicatrix naturæ?

The recognition of this fact, either as a general truth, or in relation to any one of these systems, has greatly contributed to the existing distrust in medicine, but more especially when combined with other causes, to which I shall presently advert. I have already shewn how orthodox medicine is of value, and, therefore I say, that with all the imperfections which I acknowledge, it is worthy of being held to. It cer-

tainly is advancing, though slowly, and we may hope that it will go on, and in time arrive at a position more equal to that of the other sciences. This can only be, however, by slow degrees. By sedulously working we may add little by little, till from many hands it may grow up to an importance to which it has at present no claim. It is the fault of the subject rather than the workers that this cause for distrust exists to such a degree, but there are other causes which the physician can avoid, and to these I must now advert.

In days not very long gone by, it was believed, both by the profession and the public, that patients who died, died by the hand of nature, and patients who recovered were cured by the doctor. There was a degree of untruth in both these opinions. In those days, corresponding with that strong belief, all manner of drugs were administered, and in enormous quantity; and this, I fear, continues the rule with many practitioners to the present time. Now this practice acts injuriously in two directions. To the patient, in that his system is drenched with drugs, for which there is no necessity, and to the science and art of medicine, in that intelligent people, knowing that cures

may be effected in many cases by simple means, react against taking these huge doses, and thereby have their confidence in medicine shaken.

But on the other hand, of late years a new fault has developed itself, a system of under-drugging, less pernicious than the old polypharmacy, but certainly also wrong. It is fashionable now-a-days in some quarters for doctors to give no medicine, but to leave all to nature. In some cases this practice may be right, but in most it is wrong; and may not some practitioners shelter their ignorance of medicine under a pretence of distrust in its powers? How much such a system tends to shake the confidence of the public in the resources of our art I need not point out; and here we have a third ground for the popular want of trust.

Therefore, gentlemen, let me entreat you, while avoiding the injurious system of polypharmacy on the one hand, to make yourselves practically acquainted with the action of remedies, so that you may not drift into a miserable system of under-drugging on the other.

I have thus shewn that the existing want of faith in medicine springs from sources whose importance cannot be denied, but I think I have rendered it no

less obvious that medicine, judiciously employed, is capable, in most cases, of producing most beneficial effects in alleviating suffering, aiding recovery, or even effecting a cure.

While it is in the power of every one of us to avoid the systems of over and under drugging, it is more difficult for us to overcome the other cause of distrust in our art—our real want of power. But may not this cause be overcome? I think it can. It is being overcome daily. It is the duty of us all to try to overcome it. Let us consider the best methods of so doing.

In order to place our science and art of therapeutics in a satisfactory position, we must endeavour, first, to make out the natural history of disease; second, the actions and mode of action of remedies; and, thirdly, applying these remedies, whose actions we have determined, to diseases whose natural history we have ascertained; we shall then be able to judge in what manner and in what degree our medicinal interference influences disease, promoting or hindering recovery, alleviating or increasing suffering. Each of these questions would require an immense amount of observation and research for its satisfactory solution;

but not until this is effected can medicine assume its proper rank among the applied sciences.

It is very curious to remark how little we really know of the natural history of disease, that is to say, of the course that disease would take if left to itself. The practice of the medical art has been so confounded with the administration of drugs, that very few cases are left without treatment. We cannot, of course, set aside what we know of the uses of drugs, and few practitioners can conscientiously abstain from the use of remedies which, from student days, they have been accustomed to trust; therefore, information upon this point can but slowly accumulate. Still some of the sources to which I have referred, as giving us evidence of nature's power to cure disease, are available for this other object. Thus, the results of homœopathic treatment—I mean the true, original homœopathic treatment of Hahnemann with its infinitesimal doses—may be taken as affording us, in the case of each disease treated according to its rules, a specimen of the natural course of the malady, influenced only by the moral effect of faith and hope—two influences which experience will soon teach you are of great importance.

Our knowledge of therapeutics is also unfortunately not very profound, either in regard to the physiological action of remedies—that is, the effects they produce on a healthy individual, or their therapeutical action—that is, their action on patients suffering under different diseases ; and of the mode of action we know almost nothing. We are well enough acquainted with the effects of opium on a healthy person, and have some idea of its influence in disease, but we are entirely ignorant of its mode of action. The same is true of antimony ; we know well enough its diaphoretic and its emetic properties, but who can tell us the mechanism by which these actions are produced ?

We have now to inquire what are the best means for improving our knowledge of the effects of drugs. In this we shall be best guided by observing how the knowledge we already possess has been obtained. In doing so it will be convenient to consider, first, the circumstances that have led to the introduction of new remedies, and, second, the plans that have been adopted for testing remedies so introduced. The properties of some medicinal agents have been discovered by the observation of effects following their accidental admin-

istration. Thus, a person suffering under some grave malady happening to take a quantity of any substance, and soon thereafter beginning to improve, the recovery was ascribed to the influence of the substance so taken, and in the next case of a similar kind, the same remedy was administered. Proving again successful, it would be subjected to further trials, and continuing to produce beneficial effects, it would rank as a recognized medicinal agent, useful in certain diseases. Old legends tell us, that the value of cinchona in ague was discovered in this way. An Indian who had long suffered from this malady encamped beside a little pool, fringed with cinchona trees, some of which had fallen into its waters. Bitter as it was, he drank of this pool, and to his wonder and delight he felt his ague no more. Whenever he was threatened with a relapse, he returned to the pool and found health in its bitter waters. The action of plants on the lower animals has sometimes suggested their employment as medicines. Old authors assert that, from the accidental observation of a goatherd, that his goats were purged after partaking of the Hellebore, that plant was introduced as a remedial agent.

Besides such accidental discoveries, we must bear in mind that many substances were first used from theories existing in the minds of the early practitioners of our art, or in answer to the simplest suggestions of nature. Thus, in order to relieve the heat attending inflammatory affections of the skin, old practitioners applied cold in various forms; one applied ice, another cold water, and a third the cool blades of large-leaved plants. Besides such natural suggestions, drugs have been recommended, on the strength of the most curious fancied resemblances between parts of the plant from which they are prepared, and different organs of the body — nay even upon resemblances between chemical compounds and various tissues. The common eye-bright — euphrasia officinalis — as innocent a plant as ever bloomed, acquired a reputation as a remedy in eye diseases, from the exquisite eye-like colouring of its flowers; and the maiden-hair fern, the adiantum capillus veneris, from the hairy covering of the spore case, was deemed a cure for baldness! I need not say more to convince you of the absurdity of the suggestions founded upon such analogy, and yet it is worth while to remark, that some of these medicinal agents have continued in use long after the ab-

surdity of the grounds on which they had been recommended was recognized.

Botanical affinities have afforded numerous valuable suggestions, but are not to be trusted implicitly, for we see closely allied plants possessing very different properties. Thus, in the Solanaceæ we have several species of plants which possess narcotic properties, as Hyoscyamus niger, Atropa belladonna, and Solanum Dulcamara, closely allied to another genus, Capsicum, which yields us our cayenne pepper, and to yet another which affords us the common potato. Again, in the natural family Umbelliferæ, we have the various fruits commonly called carraway, coriander, and anise seeds; we have the nutritive carrot, and the poisonous hemlock. And again, in the Cucurbitaceæ, even in one genus, we have the cucumis melo, or common melon, and the cucumis colocynthis, or colocynth plant. Still in many natural families the analogies are distinct, as in the Ranunculaceæ, Cruciferæ, Coniferæ, Melanthaceæ, and Gramineæ; and thus you can easily see how many valuable suggestions have sprung from this source.

Similarity of chemical composition, again, has been the means of suggesting new remedies. Thus Dr.

Simpson was led, I believe, to use chloroform as an anaesthetic, from its analogy to ether, which had been in use. Searching about for a substance which should combine with the anaesthetic properties of ether, a more ready vaporizability, he obtained some of this now famous remedy, tried it in a few cases, and soon established for it a reputation as one of the most valuable of drugs.

Again, medicinal agents have been recommended, as they seem to possess special properties which would be useful in certain diseases. Thus M. Fouquier was led to recommend nux vomica in paraplegia, because in that disease the functional activity of the cord was diminished, while nux vomica was known to have the power of stimulating that activity.

Such are the circumstances which have led to the first introduction of medicines; we have now to inquire into the plans which have been adopted for testing their value. It must be obvious to any one who thinks on the subject, and still more to any one who observes the course of medical practice, that vast numbers of medicines are recommended on various grounds, and

even brought into use, which are proved by experience to be utterly worthless.

Two chief methods have been employed to test farther the action of drugs. The first of these is to continue using the remedy in the class of cases for which it was first recommended, and by repeated trials ascertain whether it be useful or no; and then by more and more careful analysis make out exactly in what cases it is useful. Doubtless many valuable facts have been arrived at in this way, but from what we have already said of the curative powers of nature, you will readily perceive the dangers to which all observations of this class are exposed.

It has been too customary for our profession to take a drug into favour without sufficiently testing its properties, or inquiring into the class of cases for which it is suitable. Thus injury is done to the patient, in that other drugs which might be more useful are kept from him, and injury is done to those who recommended it, by its administration in cases for which they might not deem it suitable.

But a greater evil is the confounding of the *post* with the *propter hoc*. In numberless instances this is done. A remedy is administered, and soon thereafter

improvement sets in. The doctor jumps to the conclusion that this improvement is the effect of the remedy. The treatment is adopted. He sees with delight that every patient improves after having taken the remedy for a few days, for a week, or even sometimes after the first dose. He hastens to announce his great discovery, and so we obtain another specimen of what is, alas! too common in our museum of medical knowledge—a false fact. How numerous have been the substances warranted to cure fevers and inflammations, which we now know run on to a favourable termination if the patient's strength be sufficient to support them. Let me bring forward another instance.

A severe epidemic has visited a district; many individuals have been attacked by the disease, and numerous fatal cases have occurred. The practitioner is grieved at the non-success of all the plans of treatment in which he had been taught to rely, and is convinced of the uselessness of the ordinary remedies. Time passes on, and the district is visited by another epidemic. Satisfied by past experience, the practitioner has not recourse to the old treatment, but adopts one of his own. In his first case a speedy improve-

ment takes place, and in every succeeding instance he meets with a like success. He triumphantly publishes to the world the virtues of this new remedy, never taking into account that it was but a milder epidemic he had been treating. But the enemy pays yet another visit, and his vaunted cure comes again into requisition, but the disease is as intractable as at first, and he finds his treatment useless. Meantime our profession has gained another false fact, which may live on for many years.

The second method is by trying the effects of the drug on the healthy body of man and of the lower animals, and thereby learning the exact properties and modes of action of remedies, and then applying them in cases of disease in which such action seems desirable. This is of course a greatly more laborious mode of investigation, for, instead of consisting of a simple administration of a drug to a number of sick people, and watching whether they get well, it implies a minute and long-continued inquiry. In submitting a so-called remedial agent to such an examination, the main points to be ascertained are the effects it produces in the system, and the mechanism by which they are produced. And, further, or almost as a step

towards these, we have to ascertain the organs by which, and the form in which, the substance is passed out of the system, if it be passed out.

Having made out these points, that is to say, all regarding its physiological action, it remains to try its effects in various forms of disease in which it seems to meet the indications of nature. And this again is a matter of no small difficulty, requiring a bold as well as a wise physician to accomplish. You will readily perceive how laborious and difficult such an inquiry is, when you consider the points to be ascertained, and the many obstacles to our ascertaining them; but I must say that I believe it is only by such investigation that the science of therapeutics can be brought to a position, such as its importance entitles it to occupy.

I have shewn to what errors the former method of investigation has led, but I do not wish you to form too low an estimate of the valuable services it has rendered; only, I assert that it has not sufficed to put our science on a satisfactory footing, and that the latter method is more likely to do so. It certainly is less likely to lead us into error, and were it more practised we should have fewer false facts to bring

discredit upon us. Thus, to take a single example, you have all heard of the wonderful virtues of sarsaparilla, and yet the most independent observers have doubted its efficacy. How did it obtain its reputation? Because it was tried only by the former method. Had those practitioners who first fancied they saw it useful only tried it by the second method, they would have found it equalling in activity the celebrated *extractum graminis* of Professor Skoda. But what did they? They fancied that in process of time it could cure this malady, and so they continued to give it; and watched and watched their patients till nature cured them, and then they delighted themselves in the success of their remedy.

At the same time, gentlemen, you must bear in mind that some drugs possess therapeutic properties of which we could obtain no hint from a study of their physiological actions. For example, it would be impossible in the present state of our knowledge to predicate the antiperiodic property of quinine, from observation of its physiological effects. On this account I must caution you not to assume that you have ascertained the whole truth as to the powers of

a substance, when you have tried it only on the healthy body. You must try it also in disease. You must combine the two methods of investigation; but rest assured, that if a substance be absolutely inert physiologically, it will be so therapeutically too.

In conclusion, gentlemen, let me urge upon you the importance of your mastering this subject, which we are to study together. Remember that in practice, after you have established a diagnosis, you must determine the treatment. You must readily call up the proper remedy to give. You must give it in doses and in a form suitable to the patient. And conceive to yourselves your position, if in a case requiring immediate treatment you were ignorant of the remedies that should be employed, or had only sufficient knowledge to make your ignorance perceptible to yourselves; but I am sure I need not press upon you such considerations, for your own sense will lead you to study it carefully.

Further, gentlemen, let me advise you to try to contribute something to our science of therapeutics. Consider its importance and its imperfections, and reflect upon the immense good which any man does who

adds to our knowledge of it. Of all the substances included in the list of the materia medica, there are very few whose actions we understand; but vast as is their number, if every young medical man who has time and opportunity would set himself honestly to determine the actions of *one* of these drugs, according to such a method as we have described, we should ere long obtain an amount and accuracy of information not yet dreamt of in our philosophy. Besides those already in the pharmacopœia, chemistry is constantly furnishing new products, some of which may be of the greatest value, and a great field is open in determining the active principles of plants—a work which has been to a considerable extent accomplished, and with most satisfactory results, but which yet offers a fine field for an inquiring student. But in all such investigations, if you incline to undertake them, be careful to cultivate a love of truth, for that is the great quality for a student of nature. Love truth for its own sake, and you will so observe and so experiment that your results shall last. Without this you are constantly apt to be led away by your own theories, and, though you may by a straining of facts, or a hasty induction, attain a temporary notoriety, remember it

is by an honest and careful investigation that you can best succeed in the long run.

To what extent our art may improve, it is impossible to say, but I am convinced that as it progresses, it will become more and more a preventer of disease. As we better learn the causes of maladies, we shall be better able to prevent their occurrence. This certainly is the noblest function of our art, though one for which the world gives us little thanks. The diseases which, two hundred years ago, were the leading causes of death in this country, are so no longer ; the maladies which contribute most to our mortality bills may hereafter be rendered as innocuous as these are now. An hundred years hence, it may seem as curious to our successors that the Consort of Queen Victoria died of typhoid fever, as it seems to us that James the First of England died of an ague.