Therapeutics can become a science : essay LIV / by William Sharp.

ESSAY LIV.

THERAPEUTICS

CAN BECOME

A SCIENCE.

BY

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"*Scientific Method.*—Conclusions are not evolved out of the inner consciousness; they are suggested by a large collection of facts."

J. B. LIGHTFOOT.

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ANALYSIS.

A Letter from an eminent physician.

My Reply.

I. Drugs, *in small doses*, have power to counteract morbid processes.

This power is governed by law.

II. Scepticism as to the power of drugs prevails. A hopeful sign.

III. Examples from practice. Diseases are not incurable by drugs. It is the duty of physicians to discover remedies.

IV. What is disease? Definition of words necessary. Distinction between a single method and a single remedy. The mender of watches.

V. What is experience? The majority of medical men have no experience of the power of small doses. The choice of the dose as important as the choice of the drug. Antipraxy, first proved by experiments in health, is confirmed by experiments in sickness. The use of large doses is a failure. The use of small doses is a success.

ESSAY LIV.

THERAPEUTICS CAN BECOME A SCIENCE.

"God, who made the world, has established throughout all His works fixed laws, and these often so definite as to admit of expression in numerical terms." KEPLER.

I can have no doubt that every phenomenon in the material world is governed by weight and measure. It is my duty to endeavour to prove this with regard to the action of Drugs on the living body of man. The contrary doctrine is so well expressed in the following letter by an eminent physician, that I cannot do better than begin by inserting it:—

"October 29th, 1888.

"DEAR DR. SHARP,

I am very much obliged to you for sending me your last pamphlet. [Essay LII, 'Therapeutics ought to become a Science.'] It surprises me how you feel vigour enough to enter upon these abstruse questions of logic, &c. I am quite sure that your motive and object are right.

"As before said, I have never got my mind to run in the same channels as your's. I never could get myself to believe in the possibility of a scientific Therapeutics; or rather, the possibility that there should be found in the world substances from the different kingdoms of nature which should counteract the morbid processes or disturbances in the body. (1).*

"I do not deny that there are drugs which do affect the system, but in the large majority of cases which I

* The figures refer to corresponding figures in my reply.

see and for which I prescribe, I do not see what great value can be set on the drug. It is given for the mind and not for the body. (2).

"If I look back on the past week and think of my patients—a hard-working city man with domestic troubles is always well when he has a holiday, but not being able to get one now, comes to me for physic.—A lady who has lost her husband comes with numerous complaints.—A young man, a hypochondriac, who has taken every kind of physic in and out of the pharmacopœia, and is no better. Then my out of door patients —a case of typhoid, in which I have seen every possible medicine given, but none have arrested the disease. Then again, perityphlitis, in which I know *Opium* is good until the place is repaired, but it is not curative; so that should the homœopathic, or any other theory, be true, it is only applicable in a few cases. (3).

"My difficulty is, in speaking of remedies for diseases, to know what *disease* is. I use the term for a broken leg, an ulcer, typhoid fever, consumption, and a host of maladies, and I cannot get myself to believe that there can be any method appropriate to all. It seems to be much the same as a man saying he has a method for mending broken watches. (4).

"As regards *doses* of medicines experience guides me. I have found *Antipyrin* of little good under 10 grain doses. *Iodide of Potassium* I give often in very large doses when smaller ones fail. So with *Quinine* and *Digitalis*. (5).

"I must say finally, that I am always pleased to see men like you working at Therapeutics—the most difficult of all subjects in Medicine. Again thanking you, and glad to find you in good health,

"I am your's sincerely.
—— ——."

(1). "I never could get myself to believe in the possibility of a scientific Therapeutics, or rather the possibility that there should be found in the world substances from the different kingdoms of nature, which should counteract the morbid processes or disturbances in the body."

There are two questions put together in this sentence, and reversing the order, they are these:—Is it possible

that substances can be found which have the power to counteract morbid processes going on in the body? And, if such substances are found, is it possible that their actions can be governed by laws?

In replying to the first question it is necessary to observe that the question is not on a matter of *opinion* but on one of *fact*, and, therefore, that it cannot be answered either affirmatively or negatively, by argument. The proof of a fact lies in evidence, not in argument; and the evidence must consist of facts, not of authorities. This being so, the question may be thus stated:—Are there known individual facts which give sufficient evidence that substances have been found which can counteract the morbid processes under consideration?

It will, therefore, be seen that the aspect of drug-action before us in this Essay is not that on which we have been steadily looking in several of the later Essays. We have been looking at their action in disordering health. We have now to look at their action in healing disease. We are, therefore, in pursuit of facts witnessing to us the truth concerning the power of drugs in counteracting morbid processes going on in an unhealthy body.

The field in which these facts are to be sought for is that in which experiments with drugs have been made on the sick. When we remember that these experiments have been going on uninterruptedly for many hundred years, we cannot but ask,—How is it that the question we are now engaged upon has not been answered long ago? Surely, the experiments must have been very badly made, or very negligently observed. For, is it not wonderful that the *possibility* of drugs conteracting disease should still be doubted? And does not the doubt proclaim, as with a trumpet, the false methods of experimenting which have hitherto been pursued?

Next, let it be observed that the action of drugs given in large doses as emetics, purgatives, diaphoretics, sialogogues, &c. &c. is not included in this question; it is well known that such doses do not counteract morbid processes, but produce fresh ones.

Let it also be observed that when several drugs are put together in a prescription, as is almost universally done, the effects following the administration of them

cannot have any scientific value. Nothing is proved by them which can help us in this enquiry.

Further, it must be remembered that no department of nature has become a Science until observations and experiments have been laboriously made on minutely small quantities in measure or weight. Any one familiar with the delicate observations necessary in Astronomy, as, for instance, to determine the precession of the equinoxes; or, in Chemistry, the minute and difficult experiments required to fix the equivalent weights of the elementary bodies; or, in Mathematics, the accurate calculations essential for the solution of any of its problems; or, in Botany, the patient counting of the glands of a flower of *Drosera* needful to discover that less than the one millionth of a grain of phosphate of ammonia is sufficient to cause the tentacles bearing these glands to bend through an angle of 180°, will not only frankly admit this, but will strenuously insist upon its necessity, and that a similar course of investigation in Therapeutics is the only one by which it has any chance of becoming a Science.

The conclusion we have now arrived at is this :—The main opportunities of witnessing counteracting effects are when small doses of a single drug are given. These small doses of a single drug have not been given until in recent years, and even during this brief period they have been given by a very small minority of physicians. The field of research, therefore, though at first it appeared a large one, is reduced to one of small dimensions; nevertheless it is one which, if cultivated as it deserves to be, will yield an abundant harvest of facts.

Again, it must be observed that the question asked is not—Are there counteracting substances known for *every* morbid process? But—Do we know a number of them sufficient to make us believe in them? And to make us believe that, if due pains are taken in the search, others will be found for those morbid processes for which, at present, we do not know any counteracting substances?

Let me now repeat the question :—Is it possible to find substances which have the power to counteract morbid processes? I answer unhesitatingly that it is possible, for that some such substances have certainly been found. Begging my readers to bear in mind the observations just made, as to the limits of the field from

which facts can be obtained, and also to bear in mind the nature and laws of scientific induction carefully explained in Essay LII, the following individual facts are stated as certain in themselves, and, when taken together, as sufficient to give an affirmative answer to the question asked.

Before giving these facts it may be useful to mention the *preparations* of the drugs which have been used, and which ought to be employed by any one feeling it to be his duty, and having the courage, to repeat them.

Solid substances, as metals, are prepared by triturating in a mortar one grain with ninety-nine grains of sugar of milk till there is a complete subdivision of the grain, so that each grain of the powder shall contain the hundredth part of a grain of the drug.

Liquid substances, as the sap of plants, are prepared by taking the plant when in perfection; bruising it in a mortar; squeezing the liquid through a cloth; adding to this an equal quantity of strong alcohol; allowing time for a sediment to fall; pouring off and preserving the clear liquid. Then, two drops of this tincture, (containing one drop of the sap of the plant), are added to ninety-eight drops of proof-spirit, and labelled the first dilution.

Generally, these triturations and dilutions are the preparations given. With a few drugs, such as Arsenic, Corrosive Sublimate, Tartar-emetic, and such as Chalk (Oyster shell), Sulphur, Silica, the subdivision has to be carried to a second or a third trituration or dilution; with the first-named because they are powerful poisons, and with the second because, in their crude state, they have little or no action, or it is not the action desired.

The following ten drugs are given as individual facts, which prove that it is possible to find substances having the power to counteract morbid processes, along with the observation that it would not be difficult to multiply this number tenfold. With each drug one case is given, only intended to illustrate what is meant by its counteracting power. This case, which is as much as the narrow limits of an Essay will allow, is to be viewed not as a solitary but as a representative one. The drugs are arranged alphabetically, so that nothing is to be inferred from precedency.

Aconitum napellus.

Every medical man is familiar with the morbid condition called febrile excitement of the heart, when under the influence of simple or of inflammatory fever. It is certain that this well known plant, prepared in the manner described, and given in doses of one drop or less of the first dilution, in a dessert spoonful of water, repeated, if necessary, a few times at short intervals, can counteract this morbid action of the heart. When the beats of the heart have become quicker, sometimes much quicker, than is natural in health, this quickness is removed and the healthy beats are restored. The power of these small doses of Aconite over the heart is such that if they are continued a little too long the beats of the heart will be made slower than is healthy. I have seen them reduce the number from 120 in the minute to 40, in a few hours. Aconite acts locally on the heart, and in this manner.

In *inflammatory* fever the disquieted heart is under the control of the small doses of Aconite, while some other drug can be given alternately with it, (a dose of one or the other every two or three hours, and sometimes, as in croup, more frequently), having its local action on the organ inflamed.

In cases of simple or inflammatory fever the power of Aconite in these small doses over the heart is so reliable that it is not likely that a better remedy can be found, or need be sought for. It may, with the utmost confidence, supersede the old antiphlogistic treatment of bleeding, &c., to the incalculable benefit of the sick.

Perhaps occasionally, an individual may be met with —I have not met with one—so insensible to the action of drugs that a larger dose than the first dilution may be required. There are many adults, and all children, for whom the second, or even the third dilution is better than the first.

The effect of Aconite in all *low* fevers is injurious.

Case.—Mrs. —. Heart disease hereditary; through life her pulse has been quickened immediately by *pain* coming on anywhere. When only three years old she was bled in the arms three times on one day for a pain in her side. For many years the same irritable heart was frequently manifested, and was never relieved in a

manner to be called successful. Since then, for many years this feverish excitement of the heart has often arisen, but two or three doses of Aconite 1, half a drop for a dose, have invariably, and in a very short time, counteracted this morbid process.

Bichromate of Potash.

Ozæna is a "morbid process" of a most disagreeable kind, and has hitherto been prescribed for with very little success. The modern treatment is thus described:— "The determination of the cause is of fundamental importance. If it be syphilitic, antisyphilitic remedies must be given; if connected with enfeebled constitution tonics and good diet must be enjoined. Under any circumstances the nose should be kept clean; it should be frequently washed out by means of either a syringe or the nasal douche, with a weak alkaline solution, or a weak solution of quinine, Condy's fluid, chlorinated soda, chlorate of potash, or carbolic acid; and either stronger solutions of the same agents should be occasionally employed as injections, or appropriate powders should be frequently blown in or sniffed up."*

We are indebted to Dr. J. J. Drysdale, of Liverpool, for testing the Bichromate of Potash in health. It acts powerfully on the interior of the nose. The men employed in the Glasgow bleaching works, where this salt is largely used, soon get catarrhs, and if they stay long, the septum narium is ulcerated quite through.

I have had many patients among the negroes of the West Coast of Africa, and among these ozæna of a very bad kind has been common. Every one of these cases has been cured by the *second* dilution of Bichromate of Potash, without any topical treatment whatever. The following is an English case:—

Case.—1870, July 6th. Mr. J. M—. A youth; for some time he had a sore nose; it is now a bad case of ozæna; he has been attended for it for seven months, by a medical man who recognises it and calls it ozæna. Potassæ bichrom. 1 was given him, a dose to be taken night and morning. On the 20th, as the effect of this had been troublesome rather than beneficial, it was reduced to the second dilution, and was continued, with intervals, till

* Dr. Bristowe, *Practice of Medicine*, 2nd ed., p. 639.

November, when the nose was well. In 1871, and in 1874, there were fresh attacks, when he came to me again, and each time the nose was cured by the same second dilution.

Bovista, (Lycoperdon bovista).

There is evidence that this drug, in small doses, possesses great power over the heart. I have seen it on many occasions. The following case shows how it can counteract the muscular excitement of that organ.

Case.—1862, Feb. 26. A lady from Buckinghamshire consulted me. She has a bilious constitution, but is generally in good health, and is very fond of hunting for which she has abundant opportunities. She has suffered since Christmas from palpitation of the heart; faintings; nausea; looks very sallow; the pulse is very feeble, but the heart's action is *vehement*—I may say startlingly so. She cannot ride now, and has got thin. Bovista 1 (a tincture) twice a day for three days; then Cinchona 1, twice a day for three days.

May 14. Letter.—"The heart symptoms are decidedly better, my general health is good, and I have quite recovered my strength and appetite."

1865, Feb. 25. This lady says:—"I was cured [by the Bovista] three years ago, and have hunted as usual."

1867, July 8. She is "very well."

If it is asserted that Bovista in small doses can sometimes counteract the morbid processes going on in valvular diseases of the heart, at least in their earlier stages, I fear Dr. Bristowe will smile; for he says:—"In treating of valvular diseases we must never forget that we are dealing with affections which, in the nature of things, are incurable; that valvular defects tend, on the whole to increase."* This, no doubt, is the general experience; happily, it has not been mine.

Cantharides.

In 1693 Dr. John Greenfield was committed to Newgate by the President of the Royal College of Physicians in London for prescribing the Spanish Fly for inflammation and ulceration of the bladder. Nevertheless, it is certain

* *Practice of Medicine*, 2nd ed., p. 513.

that Cantharides, in small doses, have the power to counteract these morbid processes. The doses given by Dr. Greenfield were too large, and would have done harm instead of good, had they not been antidoted by the addition of *Camphor*.

Case.—1879, Sep. 8. While I was at the seaside a gentleman from London consulted me in the following circumstances: his age is 53; two medical men in London believe that he has stone in the bladder, and propose an operation; they have sent him to the sea to improve his general health preparatory to undergoing this operation. He is suffering much from irritability of the bladder; has a great deal of pain; and a large discharge of mucus.—Tincture of Cantharides 1, half a drop three times a day.

Sep. 24. He has been visited daily, and the medicine has been continued; he is greatly benefited; has now no pain; no discharge of mucus; and is disturbed only once in the night. 25th. This gentleman returned to London to-day; all need for an operation having vanished.

Chamomilla, (Matricaria chamomilla).

This plant has been to me as reliable and efficacious in counteracting morbid processes in its own sphere as Aconite has in its sphere. Of the organs I have found it act upon, the liver is the most important. In such cases it has been given, I think exclusively, in the first dilution, in doses of one drop, or the fractions of a drop.

Case.—1871, June 14. Mrs. McK—. Visited, age 50; married four years; has one child two years old; three years ago she suffered from a spasmodic pain in the region of the ovary; was taken up to Sir Spencer Wells for this, but, they tell me, he could not form a satisfactory opinion about it; this pain disappeared when she became pregnant, and has not returned; she could not nurse; the catamenia have scarcely returned since. Three months ago she was suddenly seized with pain in the stomach and liver, and became jaundiced; has been very ill ever since; has no appetite; the motions are light-coloured; the urine red; she is very thin; and so weak that the physician who has been attending her has told her husband that he must make up his mind to lose

her. The tincture of Chamomilla 1, in drop doses, was given her three times a day. With some interruptions this was continued till August 21, when she was quite well.

Chamomilla also disperses the enlargement of lymphatic glands in the neck. It has other counteracting powers, in still smaller doses, as on irritated nerves.

Conium, (Conium maculatum).

During many years a large number of cases of tumors in the breast of various sizes, and called by different names, but some of them certainly *scirrhus,* have been entirely removed by the first dilution of Conium. It counteracts the morbid process going on in them. It is especially successful when the tumors have been caused by blows. One case seems but a feeble representation of so many. I gathered the plant—a magnificent one—and made the tincture.

Case.—1853, May. Miss C— has a hard and painful tumor in the left breast; about the size of a marble; it has been increasing for some time.

Tinct. Con. 1 night and morning.

This was continued for six weeks, when the lump was gone.

Ignatia, (Strychnos Ignatii).

Ignatia is a drug having a sphere of action embracing several diseases. It is here introduced as one of the agents which powerfully counteract the morbid processes going on in hæmorrhoids—a common ailment productive of great suffering. I have given it in a multitude of cases, and have been astonished at its efficacy.

Case.—1872, April 9. A gentleman from London consulted me; rather past middle age; leading a sedentary life; he says, he "has been a martyr to piles for years;" for the last two months when the bowels are moved they have bled a great deal, sometimes as much as half a pint at a time; generally the blood is dark, but sometimes it is a bright red; with the motion he has prolapsus ani; there are protruding piles, and a large fringe; the urine is very thick when passed, and for a fortnight there has been a brick-dust sediment. He has had much medical advice.

Tinct. Ignat. 1, night and morning for twelve days.

April 20. Consultation.—He has been very much better; *no bleeding;* and the prolapsus is more easily returned. The constipation continues.

Tinct. Ignat. 1. a dose at night; and for the constipation, Sulphur 1, a dose in the morning, each for a week.

He was cured with this and went to Benrhydding to recruit his strength. The *dose* must not be forgotten. It is the first centesimal dilution.

Ignatia can often relieve distress of mind, so far as that can be reached through the body.

Lycopodium, (*Lycopodium clavatum*).

The sporules or grains of Club-moss, when triturated, burst and discharge a little oil; minute quantities of this can, at least sometimes, counteract the morbid process of suppuration. They cured the following severe case of abscess in the kidney.

Case.—May, 1858. An old lady; very ill, with abscess in the right kidney; I did not think she could recover. In consequence she was taken up to London, and was seen there by Dr. Bence Jones, who gave in writing the same diagnosis, and said he anticipated a fatal result. The patient was then brought back to me. The quantity of pus discharged every day along with the urine could not be measured, but it was very great indeed. After trying a few remedies without benefit, on July 19th I gave her the second trituration of Lycopodium, about half a grain for a dose, night and morning. In August there was "a fierce aggravation;" the medicine was stopped; and at the beginning of September the urine was clear, and the patient was well. She remained well through 1859 and 1860, and never had a return of the abscess.

I have seen Lycopodium cure boils, and even a carbuncle in a very old gentleman.

Sambucus, (*Sambucus nigra*).

The Elder has hitherto been thought meanly of as a medicine. In minute doses it can save life, as I have seen more than once. A tincture made of the fresh inner bark of the young branches, taken when flowers

and young fruit are on the trees, is the part to be used. In the first dilution of this tincture it is an admirable remedy for some cases of croup and asthma, and it has saved life rapidly ebbing away in the laryngismus stridulus of babies.

Case.—It has also repeatedly rescued an octogenarian from imminent suffocation, when he was suffering from attacks of capillary bronchitis, called also peripneumonia notha, and catarrhus senilis, and by an older and better name—suffocative catarrh. A dose of one drop of the first dilution, repeated in a minute or two if necessary, has not yet failed to remove the spasm—*id est*—to counteract that morbid process, which, if not counteracted, must very quickly end life. Not that this is the only remedy by any means. A little camphor water containing one grain in a thousand of water; the tincture of Musk in the first dilution, two or three drops for a dose; and Lobelia in the first dilution, can also be efficacious in this alarming condition.

Tartar emetic, (*Potassio-antimonic Oxytartrate*).

In cases like the last, but in the absence of spasm, and in common bronchitis, this drug is an admirable remedy. In the following case of still more serious mischief, it was impossible not to see its counteracting power.

Case.—1866, Dec. 14. Mr. S—, age 17, a strong and healthy young man; has been ill a few days; is in bed, breathing very hurriedly; coughs on moving, or attempting a rather deeper breath; is exceedingly weak; respirations above 30 in the minute; pulse about 100, very compressible; no resonance over the right lung; very little respiratory murmur.

Phosphorus 2 (in tincture) in the day. Aconite 1 at night.

15th. Has slept a little. Sulphur 2.

16th. Has slept more; respirations 28; pulse 100; sounds much the same.

17th. All the symptoms improved except the *mat* sound. Sulphur 2.

18th. Good night; appetite returned; respirations 20; pulse 90, but no improvement in the sounds, and the figure of the right side of the chest is visibly

altered, it is distended by a considerable effusion in the pleura.

Antimon. tartariz. 1 (trituration), two grains in twenty doses, four a day, (1000th part of a grain in each dose).

22nd. He has taken the twenty doses in four days; each day there has been a slight improvement in the breathing. Yesterday the increase of the respiratory murmur was decided.

24th. Very much increased murmur. After this he steadily recovered, and until now, 1889, has had no return of this ailment. The healthy figure of the chest was not long in being restored. The first time I saw Sir Thomas Watson after this case occurred, I told him of it and he was greatly interested in it.

Here is a group of facts sufficient to answer the first question affirmatively, and to prove that "it is possible to find substances which have the power to counteract morbid processes going on in the body," to the satisfaction of unprejudiced thinkers. But, alas! the majority of medical men are not unprejudiced thinkers, and they are sure to find some excuse for not being satisfied. It is easy to say the facts are not sufficient. So I will begin again, and will patiently place before them another group of similar facts, as true and as pertinent as the first group. The drugs speak reproachfully, and demand a hearing.

Belladonna (*Atropa belladonna*).—To me it is certain that this plant, in doses generally not exceeding one drop of the first centesimal dilution of the tincture, repeated at longer or shorter intervals according to the severity of the case, can counteract the morbid processes going on in inflammation of the brain, the eyes, or the throat. It is not meant that this includes complications nor stages of disease which have advanced beyond inflammation. And, perhaps, it may be necessary to remind my readers that this "tincture," like other tinctures of plants, consists of half sap and half alcohol.

Bryonia (*Bryonia alba or dioica*).—To me it is certain that similar doses of Bryony can often remove constipation. They can relieve the pain of pleurisy; and also many muscular pains.

Castor oil (*Oleum Ricini*).—To me it is certain that minute doses of Castor oil can cure forms of diarrhœa, especially in children, but not exclusively in them. I have used a trituration of two drops of the oil in 100 grains of sugar of milk, and have given one grain of this every two or three hours while the diarrhœa continued. It was after testing it in health, and finding that these doses, taken night and morning for a few days, constipated the bowels, that they have been given as a remedy for diarrhœa.

Cinchona.—To me it is certain that similar doses of the first dilution of the common tincture of Bark (simple tincture) can remove headaches arising from loss of blood (*e. g.* by excessive catamenia). These doses have a very beneficial action on the liver in some evil conditions of that organ. They also often act in the manner expected, but only occasionally obtained, from what are called tonics.

Creasote.—To me it is certain that one drop of the second dilution of this remarkable substance can at once stop some kinds of vomiting, even when the patient is extremely exhausted by the long continuance of the sickness.

Ipecacuanha.—To me it is certain that a dose or two of one drop (or less) of the first dilution of the tincture of ipecacuanha can also quickly arrest certain other kinds of vomiting, as when there is much retching and vomiting without serious disease. It has also great power in counteracting other morbid processes, as in the respiratory organs (*e. g.* bronchitis and asthma), and in hæmorrhage.

Opium.—To me it is certain that one drop of the first dilution of the common tincture of opium, taken night and morning for two or three days, can remove constipation from torpor of the bowels. And similar doses, given at short intervals, have the power, and how precious it is! to cure venous congestion of the brain, sometimes even when that amounts to apoplexy. I have not lost a patient from what is called obstruction of the bowels, nor from apoplexy from congestion for forty

years. These doses of opium are a good remedy for fright.

Phosphorus.—To me it is certain that a few doses of a drop of the second or third dilution of Phosphorus can cure inflammation of the bowels. I have seen the most acute pain, and tenderness which could scarcely bear to be touched, removed by the first dose, so that the patient, who was *in extremis* from pain, fell asleep in three or four minutes—and had no return of the pain, but on the contrary a speedy restoration to health. The illness had been going on two days before my visit. Some forms of giddiness are removed by these doses of Phosphorus, and it can help to cure pneumonia.

Stramonium.—To me it is certain that a few doses of the first dilution of the tincture of Stramonium can quiet the screams in delirium from inflammation of the brain. I have a vivid recollection of this.

Veratrum (*Veratrum album*).—To me it is certain that the first dilution of this tincture of the root, in drop doses, has great power over diarrhœa arising from cold, and over choleraic diarrhœa, and it has been found successful even in Asiatic cholera by those who have had this dreadful epidemic to deal with. I gave it, along with acetate of copper for the cramps, in the only case I have seen in Rugby,—it was a severe case, a traveller in passing, but his recovery was rapid and perfect. I believe others have given it in the first *decimal* dilution for Asiatic cholera.

We are seeking an answer to this question:—"Is it possible to find substances which have the power to counteract morbid processes going on in the body?" We have now seen the effects of twenty individual and well known drugs, which show us their affirmative answer in the plainest possible manner. Each drug speaks to us particularly. They join in a chorus of harmonious voices. They are, indeed, the voices of small things, but their sound is as loud and distinct as twenty peals of thunder.

Again I hear the murmurs of incredulity, and I will begin a third time, and will meekly set before my medical

brethren another group of drugs. Peradventure their testimony may prevail.

Aloes.—A few doses, each consisting of one grain of the second trituration, cure some cases of hæmorrhoids. In my practice at Bradford I met with, from time to time, cases of piles caused by large doses of Aloes taken in aperient pills.

Arnica.—It is generally believed that some cases of hemiplegia are caused by a slight extravasation of blood in the brain. When patients do not die but recover, the certainty of this diagnosis cannot be verified by examination, and so may be doubted or denied, but I do not doubt that doses of one drop of the first dilution of Tincture of Arnica taken two or three times a day, can cause a small clot of blood to be absorbed in the brain. The power of Arnica over bruises of other parts is well known.

Arsenic.—A few doses of the second or third dilution of Arsenic can cure some cases of gastritis.

Baptisia.—It is constantly boasted that no medicines of any kind can arrest specific fevers. I do not think that a remedy for typhoid fever has yet been discovered possessing a power equal to that of *Aconite* in inflammatory fever, but I am sure I have seen typhoid arrested in its early stage by one drop doses of the first dilution of the Tincture of Baptisia (tinctoria) given every three hours for two or three days and then less frequently for some days longer.

Copper.—A few doses of the first dilution of the Acetate of Copper cure the cramps of Asiatic Cholera.

Digitalis.—It is not doubted that Digitalis acts specially upon the heart; and "medicinal" doses of it are frequently given to reduce the excessive beating of that organ. It is not denied that these doses commonly fail. It is quite certain that drop doses of the first dilution of the tincture of Digitalis often strengthen the action of the heart when it is very feeble.

Nux vomica.—One drop of the first dilution of Tincture of Nux vomica is sufficient to cause to cease, in some cases, very severe colic arising from spinal irritation, and in so short a time as to excite great surprise.

Pulsatilla.—One drop of the first or second, or sometimes even the third dilution, taken twice a day, with

intervals of omission during a length of time varying from a few weeks to a few months, can cure some cases of chronic indigestion, which has existed for years.

Rhus.—What was said of Baptisia may be repeated of Rhus toxicodendron. Typhoid fever may sometimes be arrested in its early stage by one drop doses of the first dilution of Tincture of Rhus, given every three hours. In these early days of the search this is more than might have been expected, and it assures me that even better remedies than Rhus and Baptisia may be found, if only the search is diligently pursued.

Secale cornutum.—Every practitioner knows by sight the little spots of *purpura hæmorrhagica*, and will acknowledge that they are an unwelcome sight. They are not uncommon in young persons. I have seen them disappear entirely under the counteracting influence of doses of one drop of the first dilution (if I remember right) of the Tincture of Secale cornutum, taken twice or three times a day for a week or two.

Here is a three-fold cord which is not quickly broken, which cannot be broken at all by authority or by argument; much less can it be broken by abuse or by ridicule; neglect may delay but cannot prevent men's minds being ultimately bound by it, for it is made up of facts, and "words which conflict with facts are idle breath."

The three groups contain thirty drugs; they show that each drug has power, in small doses, over some well-known ailment. Other groups, having like power, might be added, but it would be useless. If men will not be convinced by the plain testimony of these thirty drugs, neither will they be convinced by any imaginable number of additional witnesses.

The facts are given from my own experiments, and I find it impossible to resist the conclusion that they answer the question of my correspondent affirmatively, and testify in the plainest manner, that "it is possible to find substances which can counteract the morbid processes or disturbances going on in the body."

We may now advance to the second question—"Is it possible that the action of these substances can be governed by laws?"

On this subject what does *à priori* thinking say? That one is filled with amazement *that it can be doubted* that the phenomena of nature, on every side so incessantly presented to our notice, are, without exception, under the government of laws which they have no power to disobey. Take any example that you like and *think* about it, and surely your mind will be penetrated with a profound conviction that both the material and the physical forces concerned in that example are irresistibly controlled by laws. It is difficult to imagine that serious thinking and sound reasoning can arrive at any other conclusion.

And what does *analogy* say? It is true that many departments of nature, on first looking at them, seem unmethodical and confused. If we remember how irregular the motions of the planets must have appeared before the labours of Copernicus, Kepler, and Newton, we shall not wonder that to discover the laws which govern these motions would be thought by many to be a hopeless task; but it has not proved to be so. Look at the tides and waves of the sea, and even at the ripples in a pool of water after rain in the streets, how disorderly they seem, and yet how much regularity the laws of gravitation and hydrodynamics have taught us about these phenomena; the facts of chemistry were in as great confusion before Richter and Dalton as those of astronomy were before Kepler and Newton. So of the air before the science of pneumatics; so of electrical and magnetical and many other phenomena now known, notwithstanding all appearances to the contrary, to be governed by laws. Analogy, therefore, steadfastly confirms *à priori* reasoning that even organic living processes are methodical and regular, and that it is not only possible but almost certain that the actions of the substances which counteract morbid processes are also governed by laws.

Let me repeat—all inanimate nature is found to be governed by laws in all its actions. If, then, the mineral kingdom is under law in everything, *à fortiori* the vegetable and animal kingdoms must be so too. It seems to me to be contrary both to right reason and to analogy to think that they are not so governed. The laws which govern living beings may not be the same,

or at least, there may be additional ones, and, doubtless, it will be difficult to discover them; but, assuredly, it is man's duty to try to discover them, and especially the additional ones. In the last century it was attempted to explain vital phenomena by mechanics and mathematics—this was an eminent failure. Now it is attempted to explain them by chemistry—this, in my judgment, will turn out an equal failure. But that laws exist and do govern vital phenomena is rendered so probable both by *à priori* reasoning and by *analogy*, that proofs of their existence ought to be sought for till this probability is turned into a certainty.

Proofs can be found only in *facts;* these are to be sought for by observation and experiment; we remember that we are not now concerned with *all* vital phenomena, but only with those connected with the counteracting of morbid processes by drugs; and we have to seek and consider facts bearing upon this question. We have seen that there are facts proving that drugs *can* counteract morbid processes, and we have now to discern, if we can, that these counteractions are brought about under the influence of laws.

To help to clear this subject let me first point out the *contrast* between our present research and that of Astronomers, Mechanics, or Chemists:—with the inanimate bodies with which these investigators are concerned, *it is force operating on inertia;* with the living bodies we have to deal with, *it is inertia in contact with spontaneity.* By spontaneity is meant the voluntary actions of living protoplasm. Experiments have very clearly proved that when any quantity, large or small, of a drug is, by any means, brought in contact with the living protoplasm of a *healthy* organ, the action of that living matter is influenced and changed—it is disordered or made unhealthy. On the other hand, the facts recorded in this Essay abundantly prove that when a minute quantity of a drug is similarly brought in contact with the living protoplasm of an *unhealthy* organ, the action of that living matter is also influenced and changed—the organ is often restored to health. Were this known only of a single drug, it would be a remarkable phenomenon, but as a solitary one nothing could be inferred from it. When it is known of many drugs, the inference that it belongs to *all* drugs

is irresistible—it is a scientific induction; it is a law-fact.

A few small doses of a drug act upon a diseased organ and restore it to health; this is an individual fact. This is the first step. By experiments with many drugs in their small doses, it is found that this power of restoring disordered organs to health is possessed by them all—not that any drug can act upon any organ, but that each drug can act in this favourable manner upon some organ—and these individual facts taken together are a law-fact. This is the second step. It follows that a law-fact must be governed by a law. This is the third step. A law must have a law-giver. This is the final step. God has mercifully provided for us these minute doses of drugs for the relief, if not always for the cure, of our bodily sicknesses, just as He has treasured up for us under the soil, vast beds of coal to warm us when we are cold.

Truth is many-sided, and some may prefer to look at the facts we are now considering on a different side of them. They will agree that the action of Aconite on the heart, for example, is an individual fact, and that the local actions of all other drugs are, similarly, individual facts. But the summing up of these individual facts, which I have called a law-fact, they may prefer to call a *law;* inasmuch as this summing up is not perceived by our bodily senses but by our minds. In this view each individual fact is a law-fact. As regards the question before us, it will be recognised at once that looking on this side entirely harmonizes with the result arrived at by looking on my side. In the conclusion to be drawn from them the two views coincide, and jointly reply that the counteraction of morbid processes by small doses of drugs is under the government of law.

My correspondent says: "He never could get himself to believe *in the possibility* of a scientific Therapeutics." He is respectfully requested to ponder over, with patient thought—he has plenty of ability to do this—the series of facts which it is my privilege and my pleasure to lay before him. Surely, reflection will present these facts in a very wonderful light. Here are minute quantities of drugs—each travelling in the blood

until arrested by its own organ—and being small enough to reach the living protoplasm, there producing effects suggestive of many marvels, and giving endless pleasure to any one who will observe and think.

Perhaps a few of these marvels, as they have struck me, may be mentioned. A first marvel is the fact that each drug acts upon a specified part (or parts) of the living body. As yet we have not the slightest knowledge of the reason of this. Why is the presence of Aconite, or Bovista, or Digitalis, manifested in the heart? Why does Bichromate of Potash bore a hole through the septum of the nose? Why do other drugs act upon other organs? We do not know any more than why eight parts by weight of Oxygen combine with one part by weight of Hydrogen to form water, and yet no one on this account doubts the law of chemical combination in fixed quantities. What we do know is that *local action* is a property belonging to all drugs. This is visibly a law-fact and necessitates the idea of a law to govern it.

A second marvel is that the quantity of each drug, to be counteracting to a morbid process going on in the organ, must be a minute quantity—a quantity so small, and so thoroughly subdivided, that it can reach the protoplasm. Larger quantities may act mechanically or chemically on the organ and cause further or fresh morbid processes, but counteracting power is neither mechanical nor chemical. For distinction it may be called a vital action, but whatever we call it, it must be governed by law. When curative effects follow larger doses, as they sometimes do, the action may be brought about by the removal of some mechanical or chemical obstacle, or by some small portion of the dose reaching the protoplasm.

A third marvel is that the effects produced by these small quantities are the contrary of those produced by certain larger ones. This also necessitates the idea of a law. It has, indeed, been said by some that such contraries are "unthinkable." They may be so to these persons; for their sakes this is to be regretted, because it only describes the limit of their powers of thinking, or the lack of information by which thoughts are supplied, and does not affect others who are able without any difficulty to think them.

A fourth marvel is that the dose given ought to be so small that no perceptible effect is produced by it beyond that of counteracting the morbid process. Anything beyond, or in addition to, this—often called an aggravation of the disease present—proves that the dose has been too large. That a cure is possible "without evacuation" was contended for by Sydenham, against the orthodox doctrine of his contemporaries, and for this he was soundly rated; nevertheless, to cure and only to cure, is the physician's plainest duty. Hippocrates said, "The physician ought to do good to his patient, or at least he should do no harm;" but more than this is true—he ought to do good to his patient without at the same time doing any harm.

It seems to me that there is no room for doubt as to the truth of these four marvels; a fifth is probable from some experiments, but needs to be confirmed by additional ones. It is that each drug, in its small doses is an *antidote* to the injurious effects of its large doses. At present this is mentioned as probably a fact; if it should be confirmed by further experiments, it will then be the reason why these small doses are antidotes to the same morbid processes arising from other causes, *e. g.* if small doses of opium antidote a congestion of the brain brought on by a large dose of opium, then we can understand that the same small doses may counteract a similar congestion brought on in some other way. As a principle for Toxicology this was the subject of Essay XXVII, published in 1875. There is nothing in Allopathy or Homœopathy to suggest this antidotal power; it is not an *aliud*, nor a *simile*, nor an *idem*, it is not something else, nor similarity, nor identity. It is generally supposed that the action of different doses of the same drug differ only in degree; the difference is not one of *degree* but of *kind*, and the difference is so great that it amounts to opposition.

All these things appear to me to be so obvious that it is another marvel that others do not see them, indeed, that they have not been recognised and accepted long ago. A principal reason why they have not been seen is that hitherto in practice all drugs have been given in doses too large, and no drug has been given alone. And there is another reason; men do not use the faculties they have been endowed with. It was, I think, Professor

Sedgwick, of Cambridge, who said, "Man has an inborn capacity of rising from individual facts to general laws." How few profit themselves or others by the exercise of this capacity! In most men it must be shrivelled up in their minds like those parts of their bodies that are called "rudimentary organs."

(2). "I do not deny that there are drugs which affect the system, but in the large majority of the cases I see and for which I prescribe, I do not see what great value can be set on the drug. It is given for the mind and not for the body."

The many long years of practice which the writer of the letter has had qualify him, and the eminent position he holds entitles him, to write on this subject; and they give to what he writes a claim to be accepted as true. It follows that the judgment pronounced in these words need not be questioned or appealed against. It is to be owned that practical experience up to the present hour finds that the use of drugs as medicines is, indeed, conventional, but otherwise is of little or no value. Others will even go further than this, and maintain that medicines, as hitherto prescribed, not only are of little value, but that they have done more harm than good.

These being the convictions of the present day, it is not wonderful that a profound scepticism as to the usefulness of drugs as remedies for disease should prevail, nor that it should find expression in the words, "I do not see what great value can be set on the drug." It is added, "It is given for the mind, not for the body!" Patients still go to their doctors *for physic*, and expect, as they have been drilled to expect, a prescription as well as advice; so a prescription has to be given them. Let me remind my readers that this is the upshot of the habits so long persisted in, of prescribing large, or as they have been called medicinal doses, of drugs, and the mixing together of several drugs in one prescription.

And let me place side by side with this the upshot, so far as it yet appears, of prescribing minute doses of drugs, and one drug at a time. After many years of active experience I have the most entire conviction that some substances have been found which, *in minute doses*, and given *alone*, can be sent to some diseased organs

and there counteract the morbid processes going on. And I cannot doubt that, by further experiments, other substances may be found, which shall be remedies for those organs and their diseases that, at present, are considered incurable.

I think this is a direct answer to the quotation from the letter. But the quotation also presents another view of a very hopeful and encouraging kind. Sixty years ago the prevalent conviction, on the subject of giving medicines to patients, was that without medicines—and plenty of them—no ailment could be recovered from, so they were given profusely. For schools the "black draught" was ordered in casks, and when complaint was meekly made that it griped dreadfully, the reply I have heard was,—"Ah! you see how necessary it was!" All this I vividly remember, and rejoice to think that the great error of that time is in course of correction, and that eminent men are willing to tell us they "do not see what great value can be set on the drug." The former darkness is visible, and this is the first step towards seeing the approaching light. For this I respectfully offer to my correspondent my congratulations and thanks.

(3). "If I look back on the past week and think of my patients—a hard-working city man with domestic troubles, is always well when he has a holiday, but not being able to get it now, comes to me for physic." A good representative case of brain-fag and mental worry. What was prescribed for him I do not know, but will venture to say that there are two or three drugs—*Anacardium* is one—which, if given in small doses, would have done this patient good. No doubt, salutary moral advice would also be given him, and the medicine would be taken only while waiting for the holiday.

"A lady who has lost her husband comes with numerous complaints." Before prescribing for these complaints, of course, one ought to know what they were, but without losing sight of the moral and spiritual support needed to carry a heart through such a bereavement, I am quite sure that good may be done by medicines for the "numerous complaints." *Ignatia* in small doses would have been one of these. It is certain that

the mind acts upon the body, and it is equally certain that the body, in its turn, tells upon the mind.

"A young man, a hypochondriac, who has taken every kind of physic in and out of the pharmacopœia, and is no better." I should have told this young man, as probably my correspondent did, that he was poisoned by physic, and I should have tried to persuade him to cease from taking any more except what I gave him, and to set himself to some hard work. The medicine would have been *Nux vomica* in small doses.

"Then, a case of typhoid, in which I have seen every possible medicine given, but none have arrested the disease." Among the "possible medicines" has a fair trial been given, in the earlier stages of the fever, to *Rhus toxicodendron* and *Baptisia tinctoria*, in small doses? And in the later stages, when the effluvia are fetid, and the condition seems hopeless, to *Sulphuric acid* in small doses? It is probable that my correspondent has not seen any of these medicines given in cases of typhoid. I have seen this fever again and again arrested by them, although it is most likely that better medicines than these will be discovered when medical men are willing to go in search of them among the small doses.

"Then again, perityphlitis." At the time of writing —I am writing at Llandudno without books—I recollect distinctly only one case of disease of the cæcum. A lady who had been under the care of physicians for eight years with a tumor in that region, and had received no benefit. I gave her small doses of *Lachesis* for a few weeks, and they brought away an incredible quantity of hard scybalæ, the size of walnuts, each covered with a white false membrane. At the end of that time the tumor had disappeared and the patient was well.

"So that, should the homœopathic, or any other theory be true, it is only applicable in a few cases."

I hope my correspondent will not be offended if I say that this is a great mistake. It has been maintained throughout these Essays, and has been adhered to in practice since 1850, that every form of disease (excluding mechanical injuries and conditions requiring the mechanical aid of surgery), ought to be treated, and may be treated, by drugs in small doses. It is my belief that physicians are not justified in pronouncing any disease incurable, or in handing it over to the surgeon for

operations. It seems to me that it is their duty—a duty which they cannot neglect without blame—to search for remedies for every disease, and not to persuade themselves that their duty is discharged until these remedies have been found. And further, it is their duty to seek for them where they may be found, *among the small doses of drugs.*

Before leaving this part of the letter, I should like, with great respect, to recommend the writer of it the next time he meets with a case, which he will know by the old name of sthenic inflammation of the brain, to prescribe *Aconite* and *Belladonna* in doses of one drop of the first dilution alternately every hour and a half or every two hours; and the next case of erysipelatous inflammation of the head and face, even if delirium has come on, to give *Rhus* and *Belladonna* alternately in the same doses and intervals. If my experience may be at all relied upon, he may be assured that he will not be disappointed in the results. If he declines to do this all that can be said further is this:—I have tried these experiments, he has not.

(4). "My difficulty is, in speaking of remedies for diseases, to know what *disease* is. I use the term for a broken leg, an ulcer, typhoid fever, consumption, and a host of maladies."

This is a striking illustration of the necessity for the definition of words. I never before met with a broken leg among diseases, but thought that *mechanical* injuries like fractures and dislocations, as well as wounds, were universally classed as cases needing the *mechanical* skill of the surgeon. Of course, inflammation or other ailments may be caused by, or follow, such injuries, and these will need medical treatment. I hope my correspondent will in future recognise this distinction. The thing to be desired and laboured for is that *all diseases* should never cease to be treated *medically*, and only mechanical difficulties be mechanically treated.

"I cannot get myself to believe that there can be any method appropriate to all. It seems to me much the same as a man saying he has a method for mending broken watches."

Here a single method and a single remedy are con-

founded. They are very different things. To treat all inflammatory diseases by antiphlogistics was a single method; to treat all chronic diseases by hydropathy is to use a single remedy. These Essays are entirely opposed to the advocacy of any single panacea. They are devoted to the study of drugs as *medicines*, and to the discovery, if possible, of the laws which govern their action, and from which rules of practice may be deduced. All other means, whether belonging to food, exercise, air, clothing, nursing, or other hygienic matters, are left entirely uninterfered with. If any laws of drug-action are supposed to be discovered, which do not apply to *all* drugs, then they are not true. If these laws do belong to all drugs, then the *method* of treating diseases by medicines inferred from them, must be "one method appropriate to all." There is no other alternative.

The simile of the broken watches is precisely the right one; there could not be a better. A watch or clock is a machine constructed of materials; some of the mechanical powers are brought into requisition, as the lever, the wheel and axle, and the screw; besides there is elasticity with its laws in the spring, or there is the pendulum with its laws. The watch mender has minute instruments adapted to each of these powers and properties, and he uses them, under the guidance of the governing laws, with exact discrimination. These instruments are various, and each of them is delicately fitted for the work it has to do. He does not use a blacksmith's hammer or pincers. So drugs, in the hands of physicians, should be used for the work which belongs to them according to the laws by which their action is governed. Would that it were not necessary to add that each drug ought to be used with a delicacy adapted to the fineness of the machinery it is intended to put right, or to remark that the finest machinery of the watch is rude and coarse compared with God's workmanship in the construction of our bodies. The large doses still in such universal use are the blacksmith's hammer and pincers. If the watchmaker observes the laws of mechanics while making or mending his watch, assuredly, the physician ought to study and try to obey all the laws of organic and living nature, for we may be sure that God has not only created the materials of our bodies but also the laws according to which these materials have been

put together, and by which they are maintained from moment to moment. Two things are wonderful to me :— that there are practical men who doubt the existence of laws ; and that there are scientific men penetrated with the conviction of the universality of laws, but who think them irresistible and uncontrollable. Cannot God, who made them, suspend or alter their operation, quite as certainly as, and much more easily than, the watchmaker can stop or alter the going of his watch ?

(5). "As regards *doses* of medicines experience guides me. I have found *Antipyrin* of little good under 10 grain doses. *Iodide of Potassium* I give often in very large doses when smaller ones fail. So with *Quinine* and *Digitalis*."

First, a few words about experience, and then a few more words about doses. And, what is *experience?* It is knowledge on any subject gained by observation and experiment. A sailor gets his experience on board his ship. A clergyman obtains his in his parish. A physician his in his practice. We hear widely different, even opposite characters given of experience; by some it is extolled as the most precious of all knowledge, by others it is condemned as slippery, perilous, and only likely to make one stumble. How is this? Because, on the same subject, the experience of one man differs from that of another both in degree and in kind. One sailor will not only learn ten times more than another sailor on the same voyage, but his knowledge will be ten times more accurate than that of his companion. So of physicians practising together in the same country and at the same period, one will be learning something every day, while the knowledge, or want of knowledge, of another will be very nearly stationary. It cannot, therefore, be surprising if the experience of the one is valuable, while that of the other is worthless. It is this latter experience that Hippocrates condemns as "deceitful." It is deceitful because it is so little, and it may be truly said of it that this "little knowledge is a dangerous thing."

It may fairly be remarked that the letter I am replying to is a representative letter—it represents the opinions and views of a crowd of medical practitioners, and it is hoped that this will prevent what follows being

taken as personal—I am very anxious not to offend my correspondent—what is said is to be taken as applicable, like a singular noun of multitude, to many. It has to be said, and it is said with great regret, that, as regards the action of medicines, the experiments made by these physicians have been so few in quantity, and so restricted in kind, that their experience falls under the condemnation of Hippocrates, that it is "deceitful;" and under the warning against little knowledge, that it is "dangerous."

It will be difficult to convince them of the truth of this startling judgment, but let me respectfully ask them to *think*. It is agreed that experience is knowledge acquired by experiment and observation. Now, surely, they will have no difficulty in seeing that they have never experimented with the small quantities of drugs talked of in these Essays, and that they have not availed themselves of opportunities of observing their action on disease. And this being admitted, it is open to every one to judge whether all such practitioners are not necessarily unacquainted with the effects of such doses, and, therefore, incompetent to have an opinion about them?

It will, I think, be understood that the experience here spoken of and condemned as deceitful and dangerous, is the experience got by prescribing what are called "medicinal" doses. In these are included "very large doses when smaller ones fail." And that the "smaller ones" here mentioned, are very much larger doses than those recommended in these papers.

A short time ago two hospital physicians were conversing together about homœopathists, when one said to the other: "They know a thousand times more about drugs than we do!" This will serve to show that the language I have used in the above paragraphs is not exaggerated.

And now a few more words about doses:—It is needful to impress upon my readers that in prescribing for any disease the physician ought to bear in mind that the choice of the *dose* is on a level of importance with the choice of the *drug*.

Next, that the rules laid down for determining the doses of medicines by successive authorities have been very different and of small value; that of the age of the

patient has prevailed the most: it has some true application, but only to a limited extent. The latest rule is a remarkable one; it is given by Dr. Lauder Brunton, who says, the dose is to be determined by the weight of the patient's body. Happily, science is not bound by authorities. Its business is to discover the *actions* of the doses of drugs, and the *laws* that govern them, by experiments, and to infer rules of practice from these laws. In this manner the following facts have been learned:—

Each drug, in whatever dose it is given, has an action in some part or parts of the body in preference to others —this is its *local* action; the organ which thus appropriates it is its *seat*.

The *kind* of action which takes place in this seat varies with the dose. There are certain larger and smaller doses of each drug whose kind of action is contrary the one to the other. This fact necessitates the prescription of the smaller doses for ailments the *opposites* of those for which the larger, or medicinal, doses have heretofore been prescribed, *e. g. Digitalis* must be given for a weak heart, instead of an excited one. *Opium* must be given for coma, instead of wakefulness, and for constipation, instead of diarrhœa.

That this contrary action of certain larger and smaller doses is true has been proved by experiments in health, and it is within the province of this Essay to add, that this truth has been abundantly confirmed by innumerable experiments in disease; these have been made by myself with more than a hundred drugs.

And let me insist upon this, that the question of the action or non-action of minute doses of drugs is a purely practical question. It involves no theory; it admits of no argument; it can be solved only by experiment.

The disadvantages of giving to the sick "medicinal doses" are:—

(1). Their large quantity often makes them act destructively on diseased organs; and so they do more harm than good.

(2). Their action is often upon healthy parts; and so new ailments are added to those already existing.

(3). The practical result, as acknowledged by my correspondent, and by all observing practitioners, is a

failure. Such a failure that Sir John Forbes, after fifty years of practice, says, "The Art of Medicine must either end or mend." Now, as it cannot end, for men will continue to fall sick, and will have something prescribed for them, it must be anxiously enquired, Is there any path discoverable by which it may be mended?

The prescribing minute doses of drugs is a new path, and those who have walked in it testify boldly that the Art of Medicine is "mended" by it. So far as this path has been pursued it is not a failure but a success.

The advantages of giving these minute doses are :—

(1). They act gently on the diseased part; there are no aggravations or other disturbances perceptible.

(2). There is no action upon healthy parts; and surely it is best to let "well" alone.

(3). When the right drug and the right dose are given the effect is salutary; the morbid processes going on in the part are counteracted, the sick man is restored to health.

The view sketched in this paper leads, I think, irresistibly to the conclusion that therapeutics can become a Science; and a Science which can be applied in practice with great success.

Teachers of Medicine and their pupils never worked harder than they do in our day, but their teachings and studies, as they have been in past days, are wide of the mark; they leave off where the real work ought to begin. Modern Chemistry is a noble science, and is more relevant than former studies have been; but it is not, and never can be, Therapeutics. The Medical Profession still exposes itself to the satire of Chaucer, though that arrow was shot five hundred years ago :—

> "With us ther was a DOCTOUR OF PHISIK,
> In al this world ne was ther non him lyk
> To speke of phisik and of surgerye;
> For he was grounded in—*Astronomye*."
>
> (The Prologue.)

HORTON HOUSE, RUGBY;
Jan. 21, 1889. (*My 84th Birthday.*)

BY THE SAME AUTHOR.

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