



THE

FAMILY PHYSICIAN;

OR, THE

TRUE ART OF HEALING THE SICK

IN ALL DISEASES WHATEVER.

BY FREDERICK HOLLICK, M. D.

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CHAPTER I.

THE ART OF HEALING THE SICK, ITS HISTORY, PROGRESS, AND PROSPECTS.

Cause of disease.—Origin and progress of the healing art.—Its present state but little, if any, superior to what it was ages ago.—Its uncertainty demonstrated by the number of different systems, and the want of agreement among its professors.—Will it ever be more certain?—Probably it will, though not in all cases. Our wisest course would be to adopt proper measures for the *prevention* of disease, and not confine our attention so much to the means of cure.—Comparison of the results of the different systems, particularly Homœopathy and Allopathy, the two most opposite.—The result shown to be the same under all the different modes of treatment, and under no treatment at all.—The real curative agent is NATURE herself, who often effects a cure in spite of Art, rather than by its assistance.—As now practised, the Medical Art is rather an hindrance than a benefit, and it would fare as well, if not better, with patients if they were left alone.—Authority of Drs. Forbes, Grisolle and others on the subject.—Still the healing art *may* be made, and probably *will* eventually, to assist Nature, and accomplish much good.—Progress of medical reform.

HUMAN health depends on the observance of certain laws, which determine our relations with surrounding objects, and circumstances; the non-observances of those laws deranges the healthy action of the system, or produces *disease*.

Unfortunately those laws have been, and are now, but little observed, and are more neglected; consequently disease has prevailed, and always will, until the observance of them takes place. This knowledge the most important man can obtain, he seems to be late in acquiring. Eventually he will acquire it, there is no doubt, and then disease will be *prevented*, by removing all causes which

produce it. Till that time comes it will always exist, and we must do the best we can to mitigate its evils.

The suffering produced by disease has always prompted attempts to *cure* it, though, from deficiency of knowledge, but few efforts have been made to prevent it. *The art of healing the sick* has been practised from the remotest antiquity, and always esteemed as of the greatest importance. Unfortunately, however, though we have made advances in almost every other art, and have perfected most of the collateral sciences, yet in this most important one we are but little, if any, in advance of our ancestors. It is true we are better acquainted with the structure of the human body, we know more certainly the action of various remedies upon it, and, in some few cases, we have even applied our knowledge to the *prevention* of diseases. But still sickness prevails, and in every instance runs nearly the same course that it did in former times. Notwithstanding all our knowledge, and in spite of our many new and powerful remedies, we have still the same black list of *incurable* diseases, and succeed but little, if any better, with the *curable* ones, than our ignorant forefathers did with their charms and simples, or even than Nature herself does, in many instances, entirely unaided.

To show that I am not unsupported in these statements, I will here introduce a quotation from an article in the British and Foreign Medical Review, No. XLI., written by the editor, John Forbes, M. D., F. R. S.—Also editor of the Cyclopaedia of Practical Medicine. It is entitled “Homœopathy, Allopathy and ‘Young Physic.’”

Says Dr. Forbes, "we do not deny that medicine has made progress, or that it can cure diseases and save life;—we merely assert that the *superiority in the proportion* of the instances in which it does so, in the present day, is most *lamentably small*, all things considered, when placed side by side with the amount of any former day. In several of our commonest and most important diseases, it is hardly to be questioned that the proportion is little, *if at all*, on our side, and in others it is *manifestly against us*."

The experience of individuals, and the records of history, also prove the truth of these remarks, and substantiate my statements.

This is much to be regretted for humanity's sake, and it prompts at once the important question "is there any dependence at all to be placed in the *art of healing*, or is it a mere deception altogether?" This is a momentous question, and one which every person should ponder well upon. For my own part I believe that disease may, and will be, cured much more extensively than it ever has been, though I cannot but fear that it will never be entirely under our control. It will always be a serious evil, and will probably mock all our efforts, and put all our knowledge to scorn, in numerous cases, as it has done hitherto. Our wisest, and surest course, will ever be, *to adopt proper means for its prevention!*

But whatever success I may anticipate from other means of treating disease, I feel bound to say, that I expect but little from the means now mainly relied upon, namely, *the administration of drugs!* The *art of healing the sick*, practised on correct principles, may be a *reality*, but the *art of Medicine*, as

now practised, is for the most part sheer deception and imposition.

The fact is, and there is no use denying or concealing it, the practice of medicine is, for the most part, a mere matter of guess-work and experiment, or slavish adherence to mere empirical routine. It is not based on established principles, nor supported by facts and reason, but is often in opposition to both.

It is true that disease is often cured while under medical treatment, but it does not follow that it is cured *by the medicine*, it may have been by other agency, or even *in spite of it!* But even admitting that a certain prescription sometimes cures any particular disease, the fact is of little importance, except to the individual. It is most likely a *fortunate accident*, and the same result may not happen in a thousand similar cases, neither with the same doctor nor with the same medicine! which proves, as I remarked before, that it is mainly a matter of guess-work and experiment.

As evidence of its uncertainty, we need only refer to the numerous systems of practice, opposed to each other in every essential particular—to the numerous parties into which each system is divided—to the bitter opposition of great medical leaders, and the difference in their opinions and practice in the simplest cases. Every new medical work teaches a new doctrine, and every day almost brings a new system into *fashionable* repute.

In the article above referred to, Dr. Forbes thus speaks on the same subject:—"This comparative powerlessness, and *positive uncertainty* of medicine, is also exhibited in a striking light when we come to

trace the history and fortunes of particular remedies and modes of treatment, and observe the notions of practitioners, at different times, respecting their positive or relative value. What difference of opinion, what an array of alleged facts directly at variance with each other, what contradictions, what opposite results of a like experience, what ups and downs, what glorification and degradation of the same remedy, what confidence now, what despair anon, in encountering the same disease with the very same weapons; what horror and intolerance at one time of the very opinions and practices which, previously and subsequently, are cherished and advised! To be satisfied on this point, we need only refer to the history of one or two of our principal diseases, or principal remedies, as, for instance, fever, pneumonia, syphilis; antimony, bloodletting, mercury. Each of these remedies has been regarded, at different times, as almost specific in the cure of the first two diseases; while, at other times, they have been rejected as useless or injurious. What seemed once so unquestionably, so demonstrably true, as that venesection was indispensable for the cure of pneumonia? and what is the conclusion now deducible from the facts already noticed in the present article, and from the researches of Louis and others? Is it not that patients recover as well, or nearly as well, without it? Could it have been believed possible by the practitioners of a century since, that syphilis could be safely treated, and successfully cured without mercury? or that it could ever be questioned that mercury was not a specific in the cure of this disease? And yet what are the opinions and the practices of the surgeons of the pre-

sent day, and the indubitable facts brought to light during the last thirty years? Are they not that mercury is not necessary (speaking generally) to the cure of any case, and that it is often most injurious, in place of being beneficial? The medical god, mercury, however, seems as unwilling to be balked of his dues, as the mythological; if he has lost the domain of syphilis, he has gained that of inflammation; and many of our best practitioners might possibly be startled and shocked at the supposition, that their successors should renounce allegiance to him in the latter domain, as they themselves had done in the former. And yet such a result is more than probable, seeing that there exists not a shadow of more positive proof (if so much) of the efficacy of the medicine in the latter, than in the former case."

I do really believe that it would be possible to find authorities, and great ones too, both *for* and *against* the use of nearly every medicine, in nearly every disease. As an instance of this, M. Lugol wrote a celebrated work on Scrofula, in which he strongly recommends iodine for that disease, and states that he cured thirty-five cases out of one hundred and five with it. But more lately, Mr. Philips has written an equally celebrated work on the same subject, in which he speaks of iodine as being of doubtful efficacy, and says that M. Lugol's thirty-five cures would have been effected by suitable clothing, food, air, and exercise, in proper season, as well without iodine as with it. He also says it is "a matter of doubt" with him whether *sea water*, and *sea bathing*, are useful in such cases; contrary to nearly all previous authority.

And in respect to *mineral waters* he gives a number of statistics from which he draws the conclusion, "that they are more indebted for the credit they possess to the enthusiasm of friends, than to the faithful register of the cures which, it is alleged, have resulted from their employment." How different is this from what has generally been taught. *When doctors disagree who shall decide between them?* A witty Frenchman once said, "If you are sick send for a doctor, and if you don't like his medicine, I will soon find you another who will prescribe something different." The celebrated Dr. Dunglison, in his "Medical Student," has the following remarks, as an explanation of the causes which lead people to put faith in quack medicines.

"The vacillation from sect to sect, which, at one time was more characteristic of our profession than it is at present, has perhaps encouraged all this, by impressing the public that we ourselves have no fixed principles to guide us, and that the unprofessional might accidentally light upon something which might be more satisfactory for the removal of disease, than the members of the profession itself. They have seen physicians, at one period, believing that almost all diseases are to be treated by stimulants: at others, embracing the view that they require the most powerful antiphlogistics, or sedatives; at others, again, referring them to some particular part of the economy—the lining membrane of the stomach, for example; and, after the lapse of a few short years, discarding this view, and becoming—what they ought always to have been,—essentially eclectic. They have seen Humourism, and Solidism, Brunonianism and Broussaism, sup-

ported in turn, and in turn abandoned, by the self-same persons; and they have felt,—what has after been expressed, and with some is considered almost proverbial,—that all medicine—regular medicine—must be uncertain, and consequently not superior to the emanations of empiricism, seductive, as they are, by a long array of successful cases, and of successful cases only, that are always brought forward in their support.”

It cannot be maintained that any one mode of practice now extant is much, if any, superior to the others, for, if it were, common sense tells us it would soon supersede them. They are all alike uncertain and have all about the same chances for doing good and evil. This is true, I believe, of all alike, regular and irregular, empirical and scientific. I have taken great pains to keep lists of all persons I have met with, or could hear of, who had been under any kind of medical treatment; and, so far as my data extend, I find the number of cured and uncured to be about the same under them all. The same fact is exhibited by the reports of hospitals, and other institutions, where the patients are under totally different modes of treatment: they vary little, if any, from each other. Let any person collect his own experience on this subject, let him inquire of all his friends; he will find one adhering to the regular practice, having found no benefit from any of the irregular or new fangled systems.—Another will tell him he was under the regular practice so many years, took so many gallons, or pounds of medicine, which did him no good, and he was cured at last by a couple of Homœopathic powders, almost invisible. The third will tell him

he tried Allopathy and Homœopathy without success, and was cured at last on the Thomsonian plan. The fourth puzzled all the doctors for a long time, and was cured at last by a bottle of some quack medicine,—the fifth was raised from his death-bed by some kind old woman's recipe, after all other means had failed,—and still another was cured by leaving off taking medicine altogether, having previously emptied the apothecary's store several times,—some have been cured by Mesmerism, and some by Hydropathy, while others have been made worse by them.

This singular and puzzling similarity of results from opposite modes of treatment, is the most striking when we compare two so opposite that if one be true the other must necessarily be false—Allopathy and Homœopathy for instance. It is much to be regretted that we have not more data than we have for this purpose, as I have no doubt but it would still further bear out my statements. The number of homœopathic institutions from which we have reports is small as yet, though we shall probably soon have more, as the system is daily extending, and lately has been adopted by the professor of medicine in the University of Edinburgh, W. Henderson, M. D. In the article already referred to, by Dr. Forbes, are some Reports of this kind, sufficient for our purpose, and as they are given by an opponent of Homœopathy, though a very fair one, we may rely upon their accuracy.

The first is a report of the hospital of the Sisters of Charity, at Vienna, which was opened in 1832, and placed under the charge of Dr. Fleischman, "a regular, well educated physician, as capable of form-

ing a true diagnosis as other practitioners, and he is considered by those who know him, as a man of honour and respectability, and incapable of attesting a falsehood." * * * "The patients have been treated according to the homœopathic system exclusively." This Report is translated in the introduction to the study of Homœopathy, by Drs. Drysdale and Russel. It exhibits "a tabular view of the cases treated at the hospital during eight years,—from the beginning of 1835 to the end of 1843. The total number of patients treated was 6551, (six thousand five hundred and fifty-one) and the following are the general results :

Remaining from 1834,	-	-	-	-	27
Admitted,	-	-	-	-	6524
Cured,	-	-	-	-	5980
Dismissed uncured,	-	-	-	-	112
Died,	-	-	-	-	407
Remaining,	-	-	-	-	50

The list includes all the usual diseases, acute and chronic, found in hospitals, and some surgical cases." The tables are not, it seems, so full in detail as to enable us to institute a comparison between them and similar ones from allopathic institutions, in particular cases, but still we are told that, "they unquestionably furnish us with isolated facts of great value, and even supply materials which may be worked into such rude approximations to truth, as medicine has, alas, been too content withal. These tables, for instance, substantiate this momentous fact, that all our ordinary curable diseases are cured, in a fair proportion, under the homœopathic method of treatment. Not merely do we see thus cured all the slighter diseases, whether acute or chronic,

which most men of experience know to be readily susceptible of cure, under every variety of treatment, and under no treatment at all; but even all the severer and more dangerous diseases, which most physicians, of whatever school, have been accustomed to consider as not only needing the interposition of art, to assist nature in bringing them to a favourable and speedy termination, but demanding the employment of prompt and strong measures, to prevent a fatal issue in a considerable proportion of cases. And such is the nature of the premises, that there can hardly be any mistake as to the justness of the inference. * * * * No candid physician, looking at the original report, or at the small part of it which we have extracted, will hesitate to acknowledge that the results there set forth would have been considered by him as satisfactory, if they had occurred in his own practice. The amount of deaths in the fevers and eruptive diseases is certainly below the ordinary proportion; but, for reasons already stated, no conclusion favourable to Homœopathy can be thence deduced. It seems, however, reasonable to infer that, even in these cases, the new practice was not *less* favourable to the cure than the ordinary practice. In all such cases, experienced physicians have long been aware that the results, as to mortality, are nearly the same under all varieties of allopathic treatment. It would not surprise them, therefore, that a treatment like Homœopathy, which they may regard as perfectly negative, should be fully as successful as their own. But the results presented to us in the severer internal inflammations, are certainly not such as most practical physicians would have expected to be ob-

tained, under the exclusive administration of a thousandth, a millionth, or a billionth part of a grain of phosphorus, every two, three, or four hours."

Here we have evidence enough that the results under the two opposite systems of Allopathy and Homœopathy are nearly the same. But in addition to this Report, Dr. Forbes gives us, in another part of the same article, a number of detailed cases, from the work of Dr. Henderson. These cases are shown to be such as the allopathic practitioner ordinarily meets with, and the result of the homœopathic practice is shown, by them also, to be quite as favourable, if not a little more so, than the allopathic. After reviewing these cases fully, Dr. Forbes remarks that, *so far as they extend*, he does "not hesitate to declare, that the amount of success obtained by Dr. H. in the treatment of his cases, would have been considered by ourselves as very satisfactory, had we been treating the same cases *according to the rules of ordinary medicine.*"

Here then we have a comparison of *the two most opposite systems*, and when *they* coincide so remarkably in their results, we cannot expect much difference from those more nearly allied. Thomsonianism—all the varieties of the regular practice—Hydropathy—and the numerous patent cure-alls, would probably vary but little from the same standard, if they were all fairly compared.

Now what is the practical result of these comparisons? Do they prove that any or all of these various systems are either true or false, or that any of them are superior to the others? No! They merely prove that *none of them* are based on *known* principles, but that, on the contrary, they *all* con-

sist for the most part, of mere guess-work and experiment! The *chances* therefore of being *killed* or *cured*, or *left as you were*, are about the same under them all.

These comparisons also prove, most incontestibly, that there is, to use the words of Dr. Forbes, when comparing the powers of Homœopathy and Allopathy, "*a third power*, common to, or incident with both, (or all) which, while it explains the triumphs of Homœopathy, reduces those of Allopathy within much narrower limits than its most zealous votaries are wont to assign it: *this is THE POWER OF NATURE!*"

That Nature can, and does, cure the worst kind of diseases, totally unaided, cannot be denied; and my own opinion is that she effects more of the cures which we see take place than is generally supposed. People are too apt to think, when a person gets well while taking medicine, that it *must* have been the medicine which cured him, but it is quite possible, as previously remarked, that he has got well *in spite of it*, and would have done so much better without any at all. There can be no doubt but that medicine often makes people *worse*, nay, sometimes *kills* them, but whether it ever effects any positive good, which would not equally have resulted without it, is, by some people, questioned. I am almost constrained to believe myself that, as medicine is now practised, it does almost as much harm as it does good, and that we should be as well off without any treatment at all as with that which we now have. Still I believe it is capable, when practised on right principles, of doing much

good, and without any prospect of doing harm. My object is to elucidate those correct principles.

It is difficult to compare this curative power of nature with the power of medicine, as we have so few cases where nature is left to operate undisturbed. She seldom has fair play. Dr. Forbes, speaking on this point, remarks:

“Health is such a blessing, and disease such an evil, that the existence of the desire to get rid of the latter, and thus to recover the former, must be co-extensive with the possession of reason by the organism that suffers. Strongly to desire is equivalent to the origination of action to gratify the feeling. Hence the origin of the medical art, which must have been coeval with the origin of man himself; hence the conception and formation of plans for the purpose of relieving pain, and of theories to account for and explain them, springing up in the minds of the first sufferers, and growing in number and variety from that time to the present; hence the constant interference of art with the natural processes of disease in the human body. When, in process of time, medicine came to be established as a distinct profession, such interference necessarily became much more frequent and much greater; until, at length, the result was, that *all* diseases, occurring in civilized communities were interfered with, as a matter of course. In the long succession of human generations, almost every thing possible, physical or moral, was, at one time or other tried, with the view of proving its possession or non-possession of remedial powers. The necessary consequence has been the fixing in the minds of men, not

merely of the professors of the medical art, but of mankind in general, these two notions, first, that nature was inadequate to the cure of most diseases, certainly of severe ones, and, secondly, that art was adequate. And these notions have not only come down to us as heirlooms of physic, but have been almost universally received as axioms, without investigation, both by the medical profession and the public. The result of all this has been, that the members of the medical profession at all times, and more especially in modern times, have been kept in a state of forced ignorance of the natural progress and event of diseases. In other words, *of the true natural history of diseases* in the human body; and they have been, and continue to be, almost as ignorant of the actual power of remedies in modifying, controlling, or removing diseases, and from the self-same cause, viz. that as art has almost always been permitted to interfere in the morbid process, it has been impossible to say what part, if any, was attributable to nature, or what part to the remedies employed!"

This is an important admission from so high an authority, and will startle many persons, who were not previously aware that physicians themselves spoke thus of their art. Many instances could be given of eminent medical men, who, at the termination of their career, have expressed not only their distrust of physic, but their utter contempt for it, and total disbelief in its utility.

Further on he remarks, on the power of nature, "that nature *can* cure diseases without assistance from art, is a fact demonstrated by evidence of the most unequivocal kind, and of almost boundless ex-

tent." It suffices here to refer cursorily to a few of the more open sources of such evidence.

1. The cure of diseases among uncivilized nations, of ancient and modern times, under the sole influence of charms, magic, or other practices equally ineffective.

2. The general treatment of diseases in the ruder and simpler times of physic, as recorded in the writings of the early fathers of our art.

3. The record of innumerable cases in the works of medical authors, more particularly before the eighteenth century, in which, from various causes, no medical treatment, or one demonstrably powerless, was employed.

4. The records of the *expectant system* of medicine, long and extensively prevalent in various parts of Europe; also of other analogous systems of practice in vogue at different times in various countries, which could exert no substantial influence on disease or on the animal economy.

5. The wide spread, and frequently exclusive employment, more especially in modern times, of universal, or as they are now called, quack medicines, *under the use of which almost all curable diseases have frequently got well.* Whether these medicines consist of inert substances, or of substances of positive medicinal power, the influence derived from their employment is nearly the same. All of them have, most indubitably, *cured* (to use this word in its common acceptation) a vast number of diseases; and whether the event was consequent on the use of a substance of no real power, or possessing *a particular power only*, must be allowed to be nearly the same thing. In our own

day we have seen many large fortunes made in this country, by the sale of various patent drugs of this kind,—from Solomon's Balm of Gilead to Parr's Life Pills; and this fact alone proves their *real efficacy*, that is, proves it on the very same grounds of evidence admitted in legitimate medicine. Success, that is, the apparent cure of diseases on an extensive scale, could alone keep up a sale of them so extensive as to enable their proprietors to accumulate large fortunes. And of this kind of success,—that is, the getting well of patients under their use, according to the legitimate *post hoc* mode of reasoning, every medical man must have witnessed many instances.

6. The now fashionable system of Hydropathy furnishes strong and extensive evidence of a like kind, although on somewhat different grounds. This mode of treating diseases is unquestionably far from inert, and most opposed to the cure of diseases by the undisturbed processes of nature. It in fact, perhaps, affords the very best evidence we possess of the curative powers of art, and is, unquestionably, when rationally regulated, a most effective mode of treatment in many diseases. Still it puts, in a striking light, if not exactly the curative powers of nature, at least the possibility, nay facility, with which all the ordinary instruments of medical cure (drugs) may be dispensed with. If so many, and such various diseases get well entirely without drugs, under one special mode of treatment, is it not more than probable, that a treatment consisting almost exclusively of drugs, may be often of none effect, sometimes of injurious effect?

An intelligent and well educated hydropathical

physician, on whose testimony we can entirely rely, informs us, that in a great many cases which have come under his care in a hydropathic establishment, he has observed the symptoms amend on the first commencement of hydropathic remedies, with a suddenness and speed which he could not conscientiously ascribe to the influence of the means used, but which rather appeared to result from the abandonment of injurious drugs which the patients had previously been in the habit of taking. In some cases, to test this point, the physician purposely abstained from treating the patients at all, and yet witnessed the same amendment. Our informant points out to us another natural field of observation in this line, in the numerous patients discharged, cured, or relieved, from hydropathic establishments, almost all of whom carry with them such a horror of drugs that they never have recourse to them, if it can be helped, afterwards. Yet these people recover from their subsequent diseases—even without Hydropathy!

7. Mesmerism, also, we think, must come either within the category of cases illustrating the curative powers of nature, or, at least, the non-necessity of drugs, or both.

8. We may next instance a large and important class of cases, in which some philosophical physicians, in all times, have instituted direct experiments, both publicly and privately, to test the powers of nature, by either *withholding all means of treatment, or by prescribing substances totally inert*: the result often being *the cure of many diseases under such management*.

9. Lastly, we must advert to what is, perhaps,

the most extensive and valuable source of all—the actual practice of the more scientific physicians of all ages, in the latter part of their career,—men of philosophic minds, as well as of much experience. It is well known, from the history of physic, that a large proportion of men of this class have, in their old age, abandoned much of the energetic and perturbing medication of their early practice, and trusted greatly to the remedial powers of Nature. The saying of a highly respected and very learned physician of Edinburgh, still living at an advanced age, very happily illustrates this point. On some one boasting before him of the marvellous cures wrought by the small doses of the Homœopathsists, he said, “This was no peculiar cause for boasting, as he himself had, for the last two years, been curing his patients with even less, namely, *with nothing at all!*”

People have been so accustomed to always see the human stomach made a drug store of, that they seem utterly amazed at the idea of doing away with drugs altogether. They must have something called *medicine*; and many physicians are in the habit of giving such drug-eaters *bread pills*, or *coloured water*, and find, like the old Edinburgh physician, that their patients get well “with nothing at all.” A case of this kind is given by Dr. Forbes himself; he says, “Many years ago, when in charge of a large body of men in the public service, we had occasion to treat an epidemic diarrhœa, of considerable violence, but not dangerous. Finding our patients recover as fast under one as another of many methods of treatment adopted, we thought there would be no unpardonable *lèse-majesté*, (treason)

either to our royal master at London, or our divine master of Dclos, in carrying our trials one step further. Accordingly, we put half of our remaining patients on a course of orthodox physic, and half on homœopathic doses of flour (*farin thirty*) in the shape of bread pills; and it puzzled us sadly to say which was the most successful treatment."

Numerous other instances could be given to show that the entire dependence placed upon drugs as curative agents, is altogether a fallacy, and that, wherever a cure is possible, it often takes place as well without medicine as with it. The disease called *pneumonia*, or inflammation of the lungs, is always looked upon as one requiring the assistance of art in an eminent degree. The use of powerful drugs, as well as the lancet and the blister, is thought to be the only means by which it can be brought to a safe termination; and both patient and doctors conclude that death is certain if such treatment is omitted. In a work by M. Grisolles, however, I find some facts which prove that even in this severe disease Nature can right herself as often without assistance as with it. At p. 560 (*Traité Pratique de la Pneumonia*) he says, "In order to appreciate thoroughly the value of various kinds of treatment cried up in pneumonia, it is indispensable that we should know accurately the progress, duration, and most frequent termination of it when treated purely on the expectant plan; but we have not this medium of comparison. It is indeed true, that M. Biett treated, during a whole year, all the cases of pneumonia that came into his wards, with emollient drink and cataplasms only, *and the mortality was*

very inconsiderable! M. Magendie employs no other treatment in the same disease."

In another place he tells us that he himself treated *eleven cases* of pneumonia, all distinctly marked, in nearly the same manner. The whole treatment consisted in confinement to bed, rigid diet, pectoral ptisans, and occasionally, but very seldom, a mild laxative, like castor oil. The patients *all perfectly recovered*, in about the usual time.

Another curious circumstance observable in comparing the results of different systems is this; not only is the *total* number that recovers the same in all, but the number is also the same *in each particular disease!* Thus all the slight diseases get well under any treatment or no treatment; the dangerous diseases kill about the same number under each system as they do when left to Nature; while a certain class of diseases are always fatal treat them as we may. This almost proves that all curable diseases fare as well without medical treatment as with, and that where Nature cannot cure, Art can render but little assistance.

As this conclusion is likely to startle many persons who have been brought up with a blind faith in physic, I will give other authority than my own for saying it. In the article by Dr. Forbes, so frequently referred to, he gives the inferences which seem to flow from his examination and comparison of Homœopathy and Allopathy, in the following words.

“1. That in a large proportion of the cases treated by allopathic physicians the disease is cured by *nature*, and not by them.

2. That in a lesser, but still not a small propor-

tion, the disease is cured by nature *in spite of them* in other words their interference opposing instead of assisting the cure !

2. That, consequently, in a considerable proportion of diseases, it would fare as well, *or better*, with patients, in the actual condition of the medical art, as more generally practised, if all remedies, at least all active remedies, especially drugs, were abandoned."

In another place he remarks, "The same truth as to the uncertainty of practical medicine generally, and the utter insufficiency of the ordinary evidence to establish the efficacy of many of our remedies, as was stated above, has been almost always attained to by philosophical physicians of experience in the course of long practice, and has resulted in general, in a mild, tentative or expectant mode of practice in their old age, whatever may have been the vigorous or heroic doings of their youth. Who among us, in fact, of any considerable experience, and who has thought somewhat as well as prescribed, but is ready to admit,—in a large proportion of the cases he treats, whether his practice, in individual instances, he directed by precept and example, by theory, by observation, by experience, by habit, by accident, or by whatever principle of action,—he has no positive proof, or rather no proof whatever, often indeed very little probability, that the remedies administered by him exert any beneficial influence over the disease? We may often hope, and frequently believe, and sometimes feel confident, that we do good, even in this class of cases ; but the honest, philosophical, thinker, the experienced, scientific observer, will hesitate,

even in the best cases ; ere he commits himself by the positive assertion that the good has been done by him."

Admissions of this kind are now becoming quite common, and the medical world is dividing into two classes, one consisting of the conservatives, who will stick to the old routine, right or wrong ; and the other consisting of the *reformers*, or those who are aware of the great evils of medical practice, as now conducted, and who think it best to admit those evils and try to remedy them. Dr. Forbes is one of the chief of these reformers, and his article, from which we have quoted so often, was the first signal gun announcing the commencement of the attack on old prejudices, bigotry and ignorance. That article fairly frightened one half of the faculty out of their wits, and startled the other half very much. Even those favourable to the new movement thought he had "*gone too far at first*," and rather wished to let the old system die gradually, than to deal it such death-blows as these. By degrees, however, they recovered from their alarm, and rallied to his support. In the last number of the "*British and Foreign Medical Review*," are quotations from a number of letters, received by the editor from all parts of the world, coinciding with his views, and desiring to co-operate with him in disseminating them. The attack on the present system of medical practice is therefore fairly begun, and not by unprofessional persons, or by those of opposite systems, but by the most eminent and liberal men in the profession, headed by no less a person than John Forbes, M. D., F. R. S., F. G. S., Fellow of the Royal College of Physicians in Lon-

don, Honorary Member of the Cambridge Philosophical Society, of the Academy of Sciences at Madrid, of the American Philosophical Society; of the Imperial and Royal Society of Physicians of Vienna, of the Royal Society of Gottingen, of the Royal Medical Society of Copenhagen, of the Medico-Chirurgical Society of Amsterdam, of the Medico-Chirurgical Society of Turin, &c., &c.; Physician in Ordinary to Her Majesty's Household; Physician Extraordinary to his Royal Highness Prince Albert; Physician in Ordinary to his Royal Highness the Duke of Cambridge; and Consulting Physician to the Hospital for Consumption and Diseases of the Chest; Editor of the Dictionary of Practical Medicine, and of the British and Foreign Medical Review.

It is not a mere trivial alteration either, which these reformers seek, but a thorough change, both in principle and practice, as is proved by the extracts already made. Under the new system, drugs of any kind are not to be depended upon as the chief agents in curing disease, but they are regarded, generally speaking, "as subservient to hygienic, regimenal, and external means,—such as the rigid regulation of the diet, the temperature and purity of the air, clothing, the mental and bodily exercise, &c., baths, friction, change of air, travelling, change of occupation," &c. Physicians must "endeavour to break through the routine habit, *universally prevalent*, of prescribing certain determinate remedies for certain determinate diseases, or symptoms of diseases, *merely because the prescriber has been taught to do so*, and on no better grounds than conventional tradition." Students are to be taught, as

we have already seen, "that no systematic or theoretical classification of diseases, or of therapeutic agents ever yet promulgated, is true, *or any thing like the truth*, and that none can be adopted as a safe guide in practice." Every effort must be made "to endeavour to ascertain, much more precisely than has been done hitherto, the natural course and event of diseases, when uninterrupted by artificial interference!" * * * "To endeavour to establish, as far as is practicable, what diseases are curable, and what are not; what are capable of receiving benefits from medical treatment and what are not; what treatment is the best, the safest, the most agreeable; when it is proper to administer medicine, and when to refrain from administering it," &c. &c. In all cases, where we are not certain of an indication, to "give Nature the best chance of doing the work herself, by leaving her operations undisturbed by art." But above all, we are "to direct redoubled attention to hygiene, public and private, with the view of *preventing* diseases on the large scale, and individually in our sphere of practice. Here the surest and most glorious triumphs of medical science are achieving, and to be achieved." In those cases where it may be thought advisable to give medicine, we should "inculcate a milder and less energetic mode of practice, both in acute and chronic diseases," * * * "discountenance, as much as possible, and eschew the habitual use (without any sufficient reason) of certain powerful medicines in large doses, in a multitude of different diseases, a practice now generally prevalent, and fraught with the most baneful consequences;" and, lastly, we should "endeavour to *enlighten the pub-*

lic as to the actual powers of medicines, with a view to reconciling them to simpler and milder plans of treatment; to teach them the importance of having their diseases treated in the earliest stages, in order to obtain a speedy and efficient cure!"

Such is a brief sketch of some of the prominent changes these reformers propose, by way of introducing the new system of "young physic."—Who that has observed attentively, and without prejudice, the present system, can say that this reform is not needed? No one! Common sense, and the best interests of humanity imperatively demand it. The public is already too much enlightened not to see the defects of the existing system; it is consequently daily losing confidence in it more and more, and the only way for the medical profession to regain that confidence is, by candidly acknowledging those defects, and showing that they are earnestly trying to remedy them. The doctor can no longer be a *dictator*, he must be a *friend*; his art must no longer be shrouded in vulgar mystery and senseless jargon, but be simplified, and made easy to be understood by all.

The letters received by Dr. Forbes are encouraging evidences that these enlightened views are held by numbers who had not previously given utterance to them, as the following brief extracts will show.

“——— (America,) Jan. 30th, 1846.

“I thank you much for having written the article. The fulness of time has come in which all this matter should be exposed fully and clearly. You have not said a thing which I have not thought of and agreed to beforehand. I know how presumptuous

this may seem ; but you know that it is one thing to entertain correct thoughts on a subject, and quite another thing to bring them out clearly and in proper order, so as to claim the assent of all good judges. This last is what you have done most satisfactorily.

“Some of the opinions you have expressed I have entertained for many long years ; others I have arrived at more lately. I first longed for a good natural history of diseases, to decide how far remedies had an effect. As connected with this I early learned the primary importance of diagnosis, and this in reference to the different stages of diseases as well as in reference to diseases themselves. It is many years since I was satisfied, in respect to acute diseases, that it was only on the first days (principally the first three days) that medicine (drugs) could be of much service. At this period I am still satisfied that acute diseases can, ordinarily, be much mitigated and somewhat shortened. But an exception must be made in regard to such as we call malignant (yellow fever, Asiatic cholera) ; and, as to shortening, in reference to the exanthemata. I have been getting more and more of the opinion, that in most chronic diseases, diet and regimen will often have a great influence,—drugs rarely any very decisive good effect and often an injurious effect only. I have long deprecated the idea (and this I have done in communication with my intelligent patients) that medicines (drugs) are necessary in the treatment of all diseases. I have urged that it was the business of the physician to take care of the sick, pointing out that *cure* and *care* were the same word originally,—and that in taking care, it

was much more important that he should endeavour to control the influence of the common agents, than that of the occasional ones, called medicines;—that he should attend to the non-naturals,—those things which nature does not decide, but leaves to our choice,—that he, the physician, should do it, and not leave it to the nurse or the grandmother. In consonance with these views, I have been unwilling to say that my patients who recovered were cured by me; for I endeavoured to cure all of them, and claimed to have done it, even when they died. In our hospital, opened twenty odd years ago, I would not allow the record books to say that so many patients had been cured, as is a common practice; but that so many were discharged well, so many improved in health, &c. I have often urged upon my brethren that we should never get the better of quackery so long as we attributed the recovery of our patients to medicine, on the *propter hoc* principle,—that is, *propter hoc* because *post hoc*. Our proper ground is, that, having studied the subject and had personal experience, we know better than others how to direct the cure of the sick; and that in doing so we may use drugs, or may not, as the case may require.”

The simple meaning of this is, that we ought not to attribute the cure to the medicine in all cases, merely because the one follows the use of the other. We can be but seldom warranted indeed in using the word *cure*; we can only say safely, that the patient *got well* after using the medicine, but whether it was by its means we cannot tell.

“ ——— (Germany,) April 15th, 1846.

“ I beg that you will allow me to thank you for

the article on Homœopathy and Allopathy, contained in the January No. of your Review. It must be hailed with the greatest satisfaction by all the members of our profession who have its welfare truly at heart, and have searched for the solution of the contradictions and riddles presented by all the orthodox works on the different branches of our science, either when studied in books only, or when compared with the statements of unorthodox schools or the results of practice. Your article must necessarily produce not only a great sensation, 'but it will lead to the most positive and the most beneficial results,' since it contains the enunciation of a principle which has before been hinted at by others, and which many, and myself among the rest, have had an 'Ahnung' of, (to use a favourite German term,) but which none have dared to give clear and decided utterance to. The article in question made upon me the impression of an outburst of matured thought and long-suppressed conviction, which has broken forth with all the vehemence of an explosion, but it is not the explosion of gunpowder, but the powerful ejection of the first steam from the boiler, which at once proves the strength and workmanship of the engine, and gives promise of a long and useful career. The works of Dr. Combe, to which I with so many others owe much—I might almost say, the entire direction of my professional creed and practice in the path of hygiene—have prepared the way and rendered the adoption of your views a less difficult matter than it might have been, had they been published ten years earlier; and though I am convinced that you yourself would soften some of the expressions used in the above-named article,

and remove stumbling-blocks which may offend tender consciences, the profession are indebted to you for the clearness and precision and courage with which you have pointed out what ought to be our aim, what must be the guiding principle in all our labours, if we are to be useful to humanity and satisfied with ourselves.

“I have learnt to look upon the prevention of disease—upon hygiene in its most extended meaning—as the true aim of the medical man. I have seen enough both in hospital and private practice to feel disgusted—I may admit as much to you—at the authorized quackery even of intelligent and highly educated medical men. I have felt the opprobrium severely, which must be the lot of the profession so long as they shut their eyes to the true working of natural laws, and as long as they wilfully refuse to admit inferences, which though necessarily the permanent basis of the ‘curative’ art, clash with received notions and traditionary prejudices. Truly has it been said that the real object of our science is less the healing of disease than the correct guidance of those that are healthy, and the interpretation of those laws by which healing *κατ’ ἐξοχήν* is rendered unnecessary. What more melancholy fact can be presented to the mere prescriber when he first enters upon the duties of his benevolent profession, with the enthusiasm of unsoured philanthropy, than the continual assurance of the Nestors of the profession that the greater our experience the more positive the conviction that we can *do nothing?* and it only proves the immense force of habit that, with such convictions, we do not more frequently see men quit a profession

which, under such circumstances, requires a constant exercise of hypocrisy and a sacrifice of principle. But sir, thanks to you, and to men like Combe, Chadwick, Clark, the young generation see the radiancy of a new light, that warms the heart while it illumines the intellect; and though their path still continues beset with dangers, they feel a firm footing, and the slough of despond is passed."

"——— (Germany,) March 8, 1846.

[*Translation.*]

"Being compelled to write in haste, I avail myself of the German preferably to my bad English. . . . The good fortune I have had, ever since the commencement of my medical studies, of residing in large hospitals, necessarily familiarized me early with the natural history of disease, a thing somewhat different, it is true, from what we read in many, and not all uncelebrated works. I have arrived at the conviction that in inflammation and fever our drugs prove rather mischievous than useful; and that Nature has then to overcome both the disease and the evil effect of the said drugs. I need scarcely tell an experienced physician that, under this term 'drugs,' I do not comprehend simply-mucilaginous, gently-resolvent, mildly-aromatic, or very slightly-astringent decoctions or infusions. My objection is to the frequent employment of emetics, purgatives, drastic resolvents, mercurials; of cuprous, cinchonous, æthereo-resinous preparations. It has been, is still perhaps, imagined, that with such remedies, inflammation and fever are to be 'cut short,' 'advanced to a crisis,' 'to resolution,' &c. Calm observation at the bedside, an unbiassed review of

circumstances, long practical study of pathological processes at the dissecting table, demonstrate the untenable nature of all these fancies which have, alas, been handed down from generation to generation. Let not Nature be thwarted; above all, let external influences be properly regulated, the instincts of the patient judiciously ministered to. Under this kind of treatment diseases are assuredly less complex in their course, and more fortunate in their termination; whilst the patients themselves are spared the distress inseparable from the use of substances for the most part so little germane to the organism."

"—— Hospital, 3d March, 1846.

"The general error into which English practitioners are falling is the empirical use of powerful remedies, with a strong disinclination to be quiet, even when the diagnosis is obscure. The general scope of your paper I take to be to combat this mistake, and I hope that it will be the means of bringing about an improvement in our practice. The table (Fleischmann's) you have given is curious, and could it be implicitly relied on, would prove to me at least that we had better, in some diseases, give up prescribing altogether. Thus we have 188 cases of rheumatism, all of which are cured; and even of articular inflammations, 203 are cured out of 211. Now we have no success at all approaching to this at our hospital. I treat about 100 cases of these diseases annually; but I should be ashamed to place the results in a tabular form by the side of the homœopathist's table.

"I trust that your paper will have a beneficial effect, by causing medical men to weigh the facts

well before they come to decision as to the effects of the medicines prescribed. I firmly believe that the cure is much oftener retarded by the medicines administered than it would be safe to say in these times of advanced medical knowledge, and the mischief would be still greater were it not that much of the stuff sent to the patient is not swallowed by him. Could the public mind be so far influenced that a post-mortem inspection of the body took place in every case of death, by experienced anatomists, the foundation of rational medicine would be laid. The opportunities we have of testing our diagnosis in hospitals, though not so good as they might be made under better arrangements, are of much service to the individual practitioners in charge, and might be made of more general use by a system of reporting."

“———— February 18th, 1846.

“I trust that your prediction, as to the homœopathic practice causing the restorative powers of the living system to be better understood and more respected, will be realized, and shall be glad to find that your pen continues to be exercised towards the fulfilment of so desirable an object. I am sure we want something to help us, and to right us, in this respect—for excessive bleedings, continual raking of the bowels by purges, and indiscriminate mercurialization of the system, cause more diseases than they cure. Injurious as these measures prove, unless temperately and very carefully applied, they are nevertheless regarded by those fresh from the schools as the great and chief resources against the most frequent diseases. I involve my own past errors and early notions in making this statement

and am free to confess that what I now know, in regard to the proper and successful treatment of many chronic diseases, and particularly such as require a tonic plan of diet or medicine, I have found out by experience, and was ignorant of them at first starting in practice.”

“ ——— (Ireland,) 13th Jan. 1846.

“ I have carefully read your ‘ Young Physic’ with much interest, and have taken every opportunity of eliciting the opinions of my brethren respecting it. Many quite coincide with your views; many deprecate, not—so far as I could make out—your *views*, but your *article*; their disapprobation summing itself up in the complaint of the Ephesian of old, ‘Sirs, our craft is in danger,’ and bitterly complaining of the mischief and danger that might accrue should the *public* become indoctrinated with such principles. For my own part, I think all your positions are in the main correct; I only doubt that you have extended some of them too far. I verily believe, and have long believed, and have long taught, that the greater portion of our so-called curative methods are, to say the least, of doubtful efficacy; and, in my mind, the instances in which giving medicine and recovery from disease are satisfactorily connected as cause and effect are few compared with the mass of cases of disease, or rather of diseases, treated.

“ I think you must ‘go on.’ If you, or some one else, does not go on in this direction, medicine is, I think, in danger of being utterly prostrated as a science and as a profession, and must inevitably descend lower and lower. It is now much, and promises to become still more, in the hands of the

drugging and drenching branch of the profession; but the next slide downwards has already not only commenced, but has made considerable progress—the slide, namely, of the practice of medicine into the hands of professed nostrum vendors, on the one hand, and mesmerists, hydropathists, homœopathists, &c., on the other. If the regulars do not in time adopt the ‘common term,’ so very clearly indicated by the results of the practice of the latter-mentioned race, and adopt, in the matter of ‘drugs,’ *ne quid nimis* for their motto, *c’est fait de nous.*”

There are about thirty closely printed pages of similar testimony, in the Review for July, 1846, and I should be glad if my limits would allow of more extracts from them.

Some excellent quotations are made from the “Philosophy of Medicine,” by E. Bartlett, professor of Medicine in the University of Maryland, but they are too long to be all inserted here; I am glad however to mention the work, as it may direct the attention of many to it who have not yet read it. He speaks encouragingly of the gradual abandonment of the present drugging system, and forcibly depicts its evils. Dr. Forbes says,—

“We know, on the best authority, that, not many years since, it was the practice of a professor of medicine, at one of the American Universities, to recommend and to prescribe calomel in *tablespoonfuls!* Even in this book Dr. Bartlett, reprobating this system, tells us: ‘It [calomel] is constantly administered—on all occasions—in all diseases—and in all their stages. It has, literally, in some instances, been made an article of *daily food*—sprinkled upon buttered bread, and mixed with it

before baking! I suppose it is no exaggeration to say, that there is more calomel consumed in the valley of the Mississippi and its tributaries, than in all the world beside.' ”]

In another part, Dr. Bartlett says,—

“I should be doing great injustice to my subject, if I did not mention, as prominent amongst the therapeutical improvements of the last quarter of a century, the change which has been gradually taking place, in the use of violent and dangerous remedies. I am inclined to regard this change as one of the greatest blessings which modern medical observation has conferred upon the human race; and it is but fair to admit, that absurd as the *system* of homœopathy is, and unsupported as its pretensions are, so far as its *peculiar treatment* of disease is concerned, it has, nevertheless, done great good *by its practice*,—its scrupulous adherence to a strict regimen, and its avoidance of all injurious remedies,—in the furtherance of this revolution. ‘It has been sarcastically said, that there is a wide difference between a good physician and a bad one, but a small difference between a good physician and no physician at all; by which it is meant to insinuate, that the mischievous officiousness of art does commonly more than counterbalance any benefit derivable from it.’ (*Sir Gilbert Blane.*) The conviction has been steadily gaining ground, and spreading itself abroad in the medical community, not only that *heroic* remedies, as they are called, are often productive of great mischief, and should never be lightly or questionably used; but that in very many cases of disease, all *medicines*, using this word in its common signification, are evils;

and that they may be dispensed with, not merely with negative safety, but to the actual benefit of the subjects. The golden axiom of Chomel, that it is only the *second* law of therapeutics to *do good*, its *first* being this—*not to do harm*—is gradually finding its way into the medical mind, preventing an incalculable amount of positive ill. The real agency of art is more generally appreciated than formerly; and its arrogant pretensions much more truly estimated and understood. It is coming every day to be more clearly seen, that perhaps its most universal and beneficent function consists in the removal and avoidance of those agents, the action of which is to occasion or to aggravate disease; thus giving the recuperative energies of the system their fullest scope and action, and trusting to them, when thus unembarrassed and free, for the *cure* of the disease. ‘This, I apprehend, is so well understood among well educated physicians, that the word *cure*, as applied to themselves, is proscribed as presumptuous, and rarely, I believe, escapes the lips of any practitioner, whose mind is duly tinctured with that ingenuous modesty which characterizes the liberal and correct members of the profession.’ (*Sir Gilbert Blane.*)

“It is melancholy to think what an enormous aggregate of suffering and calamity has been occasioned by a disregard of the axiom which I have quoted. Our means for the direct removal of disease are limited in extent, but it is not so with our power to augment and to cause it; this is unlimited. Difficult as it may be to cure, it is always easy to poison and to kill. We may well congratulate ourselves and society, that the primary and fundamen

tal truths, of which I have been speaking, are finding their right position, and producing their legitimate results; and that long abused humanity is likely, at no very remote period, to be finally delivered from the abominable atrocities of wholesale and indiscriminate *drugging*."

There is also an excellent letter from Isaac Gilchrist, M.D., detailing some valuable experiments made by him in treating severe wounds, and other surgical cases, by cold water only, or leaving them to the power of nature altogether. The result was that the patients recovered quite as well as they do under the most formal scientific treatment; often they recovered sooner and more completely.

A work has lately been published at Leipsic, by Dr. F. Pauli, entitled "Researches and Practical Observations in Surgery," being the result of fifteen years careful study and experience. At the end of this work the author gives a number of Aphorisms, some of which we quote, to show how extensively these opinions are held.

"The deficiencies of medicine are best learned from the systems which from time to time spring up, and upset those that have preceded them.

"Dissertations generally advance a science but little. I not long ago examined critically the literature respecting one of the most important diseases; I laboured through one hundred and forty dissertations treating of it without finding a single profitable idea.

"A medical journal is wanted which should communicate only cases that have ended unfavourably. It would be of more service than a number of others.

“It would be well worth while to collect together all that is positive in medicine, and of which not a jot is transitory. It would make but a small book.”

M. Magendie, the celebrated physiologist and physician, expressed very similar views in an opening address which he gave lately to the College de France. He says,—

“Medicine can only exist but inasmuch as patients have faith in it, and claim its assistance. It is not by theories that it lives, but by clients. Now it is impossible to conceal to ourselves that, at present, a certain proportion of the public abandons classical medicine, ironically called *old medicine*, and throws itself into the arms of new systems, thereby firmly believing that it associates itself to the progress of intellect.”

And again,—

“This brings us back to a question which I have often raised, and which I have endeavoured to elucidate by experiments for the last ten years—viz., what is the influence of treatment on the progress of disease?

“In hospitals, as well as in private practice, we must first take into consideration the influence of the mind of the patient. Now there can be no doubt but that a patient who takes a medicine, experiences immediate benefit, from the conviction that it will favourably modify his disease. If this favourable result takes place, what has been the real share of the medicinal substance administered? Medical men are always inclined to attribute the cure of the disease they treat to the means which they have employed; but recollect that disease

generally follows its course, without being influenced by the medication employed against it. Thus it is that you are often much deceived. A given medicine will succeed in an apparently serious case, and will fail in another case of a less dangerous character, without your being authorized to attribute to yourself in any way the success or the failure.

“These reflections explain at once the cures of which Homœopathy is so proud. Homœopathy, instead of bleeding a patient, will place gravely on his tongue a globule of aconite, which he will swallow with confidence and faith. You then see the disease improve. But it would have improved just as well without globules, provided some singular operation had struck the imagination of the patient. It really is too great a stretch of credulity to believe that a globule prepared by the formulæ of Hahnemann can contain any active principle.—But, on the other hand, any one who has seen disease, must at once admit that this same globule may exercise, through the imagination, a powerful moral effect. You must not, indeed, accuse me of partiality towards Homœopathy, when I state that I firmly believe that a physician would cure a patient sooner with globules, if the patient has faith in them, than with the most appropriate medicinal substances, if he distrusted their action.

“What I state respecting medicinal substances is equally applicable to bleeding. A patient is seized with the symptoms to which the term inflammatory has been applied, and asks to be bled, believing that the loss of blood will cure him. You open a vein, and the abstraction of a certain quantity of the vital

fluid is followed by an amelioration of the symptoms. But take care how you interpret the fact; the improvement may be owing to the moral effect produced, more than to the venesection. I will mention as a proof what I have often observed in my wards at the Hotel Dieu. A patient labouring under acute disease—pneumonia for instance—enters the hospital, believing firmly that he ought to be bled; I bleed him, but merely to the extent of two or three ounces; too small a quantity for the circulation to be in the least influenced by its abstraction. Nevertheless, the patient becomes more calm, and says he is better. A mere trial of bleeding will thus often suffice to arrest the progress of a disease which under another physician would be treated by abundant depletion. For more than ten years I have not found it necessary to have recourse to copious bleeding; in other words, I have rather endeavoured to act on the mind of the patient than on the circulation, and I have no hesitation in asserting that my practice has not been the less successful. Indeed, were I to tell you my mind entirely, I should say that it is more especially in the hospitals, in which the most active treatment is adopted, that the mortality is the most considerable.”

This comes very near admitting that active medical treatment is a gross deception, and at all events is additional testimony to its uncertainty, and to the power of nature.

Baglivi, a celebrated Italian physician, used to say, that the human body, when diseased, might be compared to a man who had fallen into a well; the

people round begin to throw down to him every thing that comes to hand, till at last, if he be fortunate, something reaches him by which he can support himself above water till relieved; but if by chance some improper article be thrown, as a brick for instance, and hit him on the head, it only sinks him all the sooner. In the same manner, when a man is sick, the physician throws into him a lot of drugs at random, and if by chance one is thrown that assists nature, the man is benefitted; but if, on the contrary, one is thrown that hurts nature, it only makes his sickness worse, or perhaps kills him. In the same spirit D'Alembert, a French physician, used to compare nature and disease to a man struggling with his enemy in a dark room; the physician comes in with a club, that is, medicine, to make peace; he begins to lay about him at random, and if he hits the enemy, or disease, he kills it, but if he hits nature, he kills her—the chances being about equal which catches the blow.

Many other such authorities could be given, but these are sufficient for our purpose. We have made it manifest, both by fact and by authority, that the art of medicine, as hitherto practised, in any and every form, is altogether uncertain, and that patients would stand nearly the same chance with no treatment at all, as with that they now receive. We have also demonstrated that nature herself possesses the power of curing diseases when she is not interfered with. But still, as we have previously stated, we believe that art *may*, and eventually *will*, assist nature in the cure

of disease, possibly to a greater extent than we can now expect.

We will endeavour to show in our next chapter, when and how this assistance should be given, and when nature should be left alone.

CHAPTER II.

THE TRUE BASIS OF MEDICAL SCIENCE.

No art or science can progress unless based upon true fundamental principles.—The medical art at present has no fixed principle.—Difficulties in the way of effecting a reform; undue deference to authority and mere experience,—The real value of them shown.—The fundamental principles of medicine can be known only by a proper study of the human system, and its external relations.—General description of the human organization:—The Digestive Organs—the Circulating Organs—the Respiratory Organs—Assistant Organs—Mechanical Organs.—Necessity for a motive, or vital, power to cause the action of the different organs—the Nervous power provided for that purpose, and no action whatever can occur in the system without it.—The Nervous power probably identical with the Galvanic.—Description of the Galvanic power, and the manner in which it is engendered, artificially and naturally.—Description of the Nervous system, and the manner in which it acts on the organization.—Similarity of the Nervous and Galvanic power proved by the experiments of Dr. Wilson Philips and others.—Importance of these experiments.—Causes of disease.

THE perfection of any art or science depends upon the certainty, or truth, of the principles upon which it is based. Many pursuits are dignified by being called arts and sciences that do not deserve these names, because they are based merely on assumed facts, or hypotheses, and have neither truth nor stability. Astrology and magic, for instance, were called sciences in the dark ages, but not being based on true principles, or facts, they could exhibit no positive results, nor make any progress; on the contrary as knowledge advanced they became neglected, till now they are mere matters of history. How different it is with arithmetic, geometry, chem-

istry and the other real sciences. They are continually progressing, and we can depend upon their accuracy, because their fundamental principles are true and well known. The value therefore of any so called art or science, and its claims on our attention, will depend entirely on the truth or falsehood of the principles it is professedly based upon, and no mere assumptions or theories, no matter how great the authority from whom they proceed, can impart to it any value, or just claim to our notice, if those principles are false.

What is now called the *healing art*, or *medical science*, we have shown, in our former chapter, to be altogether uncertain, and for the most part unsatisfactory, in its results, simply because it is without established principles; in place of which we have vague theories, authoritative assertions, and empirical routine. The question is seldom asked, in any case, "*what does nature say?*" or "*what is supported by the fact?*" but simply what is said by some celebrated author, or taught in some college? And the answer varies every day. Medical practice *will*, eventually, be elevated to the dignity of a science, having a firm foundation in fact, and exhibiting positive and valuable results. The impending reform which is to accomplish this desirable change, is now being pointed out, and advocated by some of the most eminent medical men of the day, whose philanthropy and good sense are as creditable to themselves as they are useful to society.

One great difficulty in the way of effecting the change is, the deference which exists for mere authority, and the mistaken notion that *experience alone* is of paramount importance in treating dis-

ease. It should always be borne in mind that all men are fallible, and that the greatest authorities may be mistaken. A man may have a comprehensive mind, and a good stock of information, but yet be warped by prejudice or blinded by bigotry—He may see clearly into many abstruse subjects, and yet be perfectly ignorant on some points where the commonest understanding would not be at fault. The present system of medical education is calculated rather to cramp the mind, and to prevent progress, than to assist in its expansion. The object of teachers and institutions appears rather to be to *make proselytes*, and uphold their own doctrines, than to discover the truth. The greatest and most eminent men in the profession have been rebels to orthodox authority, and have generally stricken out a path of their own; but unfortunately others, instead of following their example, have made authorities of them in their turn. In science nothing should be admitted as established, unless proved by facts.

Mere experience, without a knowledge of principles, is comparatively valueless. It may make a person acquainted with a number of isolated facts, but it can neither enable him to explain them, nor make them available in the discovery of new truths. A person with good judgment, and a knowledge of principles, will succeed in any case better than one who has experience merely, let it be ever so great. For instance, a man might have immense experience in mensuration, for ascertaining the dimensions of objects,—he may have measured thousands of squares, triangles, and parallelograms, and yet, on meeting with one different from what he had pre-

viously seen, find himself completely at fault, while another, with little or no experience, but knowing the principles of geometry, would accomplish the task at once. So it is with all other sciences; experience *alone* is of use merely in *precisely similar cases*, but by knowing fundamental principles we see what course to pursue in every case, whether it be like what we have previously seen or not.

The present essay is intended to deduce from facts only, and not from theory or mere authority, those principles on which medical practice should be founded, so that it may become a real science, and a certain means of alleviating human suffering.

It will be requisite, in the first place, to show what the human system is in a state of health, and then to explain how it becomes diseased; after which we may understand how far health can be restored, and by what means.

It is not requisite here to give a detailed treatise on human anatomy and physiology, but merely such a general description as will make our exposition intelligible.

The human system is an assemblage of organs, each adapted with wondrous perfection, to the performance of some particular function, and the whole of them working together for the accomplishment of two objects—first the maintenance of the individual's own existence, and secondly, the continuance of the species.

The organs which seem of primary importance are those which perform the function of *nutrition*. All organized bodies require the constant addition of new matter, either to enable them to grow, or increase in size, or to make up for the waste which

incessantly occurs from the action of the system. This new matter is derived from the food which is eaten, and which is changed, by the action of the digestive organs, into a substance similar to that of the body itself. When we call to mind the various articles eaten for food and their dissimilarity to each other, it seems little short of a miracle for them to be changed into the same substance, but such is the fact. The body is formed from the fluid called the *blood*, which contains the element for making flesh, bone, hair, the various fluids, and in fact every other part. The food is therefore converted into blood, and then sent to every part of the system to afford the nourishment required.

The food is first masticated, or broken into small pieces, in the mouth, it is then passed down the oesophagus, or meat pipe, into the stomach, and is there acted upon by a fluid called the gastric juice, which dissolves it into a gray pulpy mass called chyme. The gastric juice is secreted from the inner coat of the stomach, and it possesses an astonishing power of solution, which few substances can withstand. The chyme is passed from the stomach into the beginning of the small intestines, called the duodenum, where it is mingled with a fluid brought from the liver, called the gall, or bile, and another brought from the pancreas or sweetbread, called the pancreatic juice. Immediately after its union with these two fluids the chyme divides into two portions. One white like milk, called chyle, which is the same as blood excepting in its colour; the other the mere refuse, forming the *fæces*. Both these parts proceed along the intestines, from whence the chyle is absorbed, or taken

up, by a set of little vessels called the lacteals, which, after passing through some bodies called the mesentric glands, empty themselves into a tube called the thoracic duct. This tube runs up the back bone, and at last unites with a vein near the left arm; the chyle is thus mixed with the blood, and goes with it to the lungs, when the action of the air while breathing makes it red, and thus it becomes real blood, which is then required to be sent all over the system.

The organs employed in circulating the blood are, the heart, veins, and arteries. The heart is a double organ, each part of which is, mechanically speaking, a forcing pump, or an engine so constructed, with valves and chambers, that when in action it will impel the fluid within along the tubes in connection, the same as the fire engine propels the water along the hose. The left side of the heart is filled with pure blood, which it propels into a set of tubes connected with it called the arteries. These tubes permeate every part of the body, the hard bones, and colourless fluids, as well as the flesh; there is no spot, internal or external, even the most minute but they reach, and thus supply every part with its requisite nourishment. At their extreme terminations the arteries become extremely small, so that the naked eye loses them altogether, and at last seem to disappear and another set of vessels called the veins begin. It is probable that the two sets of tubes are connected together, but from their minuteness it is difficult to show the fact. The blood when found in the veins is much altered, its colour is darker, and it is no longer capable of nourishing the body, in fact it is a poison to it. The veins run the re-

verse way to the arteries, and empty into the right side of the heart, which acts the same as the left side and propels the impure blood, by means of tubes provided for the purpose, into the lungs which lie on each side. The lungs are formed of a number of very small tubes or cells, some of which are filled with the impure blood, and others with the air which is inhaled while breathing. The air thus brought into contact with the impure blood takes up its impurities, which are thrown out as we respire, and thus the blood is again made pure. It is then sent to the left side of the heart and again propelled into the arteries.

The lungs are also assisted by several other organs. The gall is taken from the blood by the liver, the urine by the kidneys, and much waste matter by the skin; but the great purifiers are the lungs, by which several pounds of waste and poisonous matter are ejected daily.

To enable us to find our food and perform other locomotive acts requisite for our existence, we are provided with an apparatus composed of bones, muscles, joints, and sinews, which act in a purely mechanical way. The muscles possess the remarkable power of contracting and relaxing, or becoming longer and shorter, and thus producing the various motions of the body. In the arm, for instance, we have a joint, called the elbow, to the bones above and below which are attached a number of muscles, some of which by their contraction bend the joint, while others straighten it. In the same way is effected every other motion we perform.

In this way is the human system made,—a com-

bination of vital and mechanical organs, adapted for the performance of certain functions requisite for the individual's existence. It may be compared to a complicated machine, all the parts of which act in unison. It is also like the machine in other respects,—it wants a motive power!—The various organs may be ever so perfect, but still they cannot work of themselves. The machine needs the steam-engine, and the human system also requires something analogous.

The power which makes the heart beat, the stomach digest, the muscles contract, and, in short, causes every other bodily motion, is the Nervous fluid. Recent discoveries have made it extremely probable, in fact nearly certain, that this mysterious power which we call nervous, is identical with electricity, magnetism, or galvanism, which, as we shall show further on, can effect the various motions of the organization when the nervous power is extinct.

Galvanism is a mysterious agent and it is but recently that we have found means of controlling it for useful purposes. We have, however, examples of its workings in the electrotype process, various chemical changes, and in the miraculous lightning telegraph, and, in some instances, it has even been employed in propelling machinery, in place of steam, which, it is thought probable it will eventually supersede entirely. Its effects on the living body are familiar to most people, galvanic batteries being now very common. Its effect on the dead are not so familiar, though often observed; suffice it to say that the limbs and organs of a dead body will move by its means, and exhibit all the ordinary pheno-

mena of life. There is no doubt but it is the principle of vitality, or life itself, and that nothing comes into existence, or lives, but by its means. Animals have been created by it artificially, and vegetables have been made to grow in one hour as much as they ordinarily do in several days. The heat which warms us, and the light by which we see, are only modifications of this mysterious power—the soul of the universe, which causes the gentle breeze and the refreshing shower, the furious hurricane, with its deluge and lightning's flash, the splendid aurora borealis, and a thousand other phenomena that delight us with their beauty, or appal us with their might; and by which also the world itself, and the whole planetary system of which it forms a part, are doubtless kept and moved in their orbits. As it is in the universe by the electric power, so it is in the human body by the nervous. Not the slightest motion or change can occur, not a thought can originate, or a feeling be experienced but by its means.

Galvanism, or electricity, is artificially engendered in various ways. All chemical action gives rise to it, or even changes in temperature, or motion merely. The conversion of solid bodies into fluid, or fluids into gaseous, does the same. When steam is formed, under high pressure, an immense quantity of electricity is engendered, as was shown by a large electric machine recently made on that principle. The most convenient mode of producing it however, artificially, is by a combination of metals and acids, called a battery. The chemical action is very great, and the galvanic power engendered by it is further increased and modified by traversing coils of wire.

These instruments are now made vastly more powerful than formerly, though smaller in size and more convenient to manage.

The nervous power, or human galvanism, is produced by the action of a natural battery, forming part of the system. This battery is composed of the brain and spinal marrow, and the nervous cords connected with them. The organization and composition of the brain are apparently simple, but there is, undoubtedly, much in both that we have not yet comprehended. The manner in which the brain acts to produce the nervous power we do not know, but that it does so is undoubted; it will even produce common galvanism under certain arrangements.

In connection with the brain and spinal marrow are certain white cords, called the nerves, these are very numerous, and are sent to every part of the body, like the arteries. The use of the nerves is, to transmit the power engendered in the brain or spinal marrow, wherever it is wanted. The same as the arteries convey the blood from the heart.

No organ can move unless it be connected by a nerve with one of the great centres. This is easily seen by cutting the nerves, as those going to the arm for instance, and all power of motion is at once lost. Cut through those that go to the heart and it stops beating, or those that go to the stomach, and it will be able no longer to digest. If the spinal marrow be severed at a certain point all the organs below become immediately paralyzed, owing to their connection with the source of power being destroyed. This arrangement of the nerves it will be seen, is precisely that of the wires of the magnetic telegraph.

The battery at one station engenders the power, and the wires convey it to the other, let the distance be ever so great. The will of the operator at one end is thus transmitted to the other and produces the effect he desires; in the same way, when I wish to move my arm, the *will* sends the nervous power from the brain down the nerve to the muscle. This makes the muscle contract and so produces the motion. If you cut the wire no communication can take place between the two ends of the telegraph; if you cut the nerve going to the arm, no communication can occur between it and the brain, and it no longer obeys the will.

The brain is divided into two parts, the one, occupying the upper and frontal portions of the skull, called the cerebrum, and supposed to be more immediately concerned in the moral perceptions and thinking; the other, occupying the lower and back part of the skull is called the cerebellum, and appears to be concerned in producing what are called the propensities, certain involuntary motions, and sensations. The spinal marrow is also divided into two parts, or columns, the one in front called the anterior column, and the one behind the posterior. On examining a nerve belonging to any organ, we find it is composed of two parts, and on tracing it to the spinal marrow we find that one of these parts, or threads, springs from the anterior column, and the other from the posterior. These two nervous threads have different powers; the one from the anterior column causes *motion*, while the one from the posterior column produces *sensation*, or feeling. These two functions are distinct from each other; for instance, if the nerves of motion proceeding to

the arm be cut, the individual can no longer move it when he wishes, but he may still feel, or have sensation in it. If the nerves of sensation only be cut, the arm can be moved, but will have no feeling, it may be burnt, or cut, and still no pain be experienced. But if both nerves be cut, sensation and the power of motion are both lost. This is an important fact, which we shall have occasion to refer to again. We often see persons who are paralytic, that is, incapable of motion, in some parts of their bodies, owing to the nerves losing their power of transmission. Sometimes the paralysis will affect merely the nerves of motion, at others merely those of sensation, and sometimes it will affect both.

The nerves of the organs of sight, hearing, taste, and smell, apparently spring from the brain, and are essential to those functions,—cut the optic nerve and the eye can see no longer, or the auditory and deafness ensues.

Most of the nerves which proceed to the internal organs produce involuntary motions, that is, they are not under the control of the will. The motor nerves of the arm, as I have shown, can be excited to act on the muscles by the will, but those which act on the heart, lungs, stomach, and other organs, to make them perform their peculiar functions, are independent of it. Thus we cannot cause, or stop, the circulation of the blood, or the process of digestion, by merely willing it, the same as we do the bending or straightening of the arm. Still these involuntary motions are as strictly dependent on nervous agency as the voluntary ones.

Each organ has its own set of nerves, distinct from those of the other organs, they are all however

connected with each other more or less, particularly by certain nerves called the sympathetic. These nerves interlace themselves with the others, and thus unite them all sympathetically together. This is the reason why a disease in one organ often affects another very remote from it, and why irritation in one part of the body will frequently produce an effect in some other part apparently unconnected with it. Thus constipation in the bowels will often cause inflammation in the eyes, and worms in the intestines will cause itching in the nose. Tickling the throat with a feather will act on the stomach and produce vomiting, or tickling the soles of the feet will act on the diaphragm and produce laughing.

To prove that this power we call the nervous is similar to the galvanic, various experiments have been made some of which we will detail. Dr. Wilson Philips was the first to conduct them systematically, but they have since been repeated, extended, and varied in numerous ways. His first experiments were on digestion. He took two rabbits, and fed both with the same kind and amount of food. In one he cut through the *par vagum*, or nerve proceeding to the stomach and lungs; an operation apparently simple, but which so impeded the action of breathing, that the animal wheezed, and at last died of suffocation. The other was not interfered with; but at the end of twenty-six hours, was killed, and both were examined. In the stomach of the one which had not been operated upon the food was found fully digested, but in that of the other, it was found nearly unchanged. Thus demonstrating that, unless the nervous power is conveyed to it, the stomach cannot digest. He next

took two other rabbits and treated them in precisely the same manner, but to the one that had the nerves of the stomach cut he applied a small galvanic battery, so that the galvanic power passed through the stomach, in the same way that the natural nervous power used to do. At the termination of the same period of time as in the first experiment they were both killed, and it was now found that the one whose nerves were cut had digested nearly as well as the other which had not been interfered with; thus showing, that the stomach could perform its functions by means of ordinary galvanism, the same as by means of the nervous power itself. Similar experiments were performed on the heart and other organs, in all of which it was found that their action ceased on cutting the nerves, and commenced again on transmitting the galvanic power. This proves that the nervous and galvanic powers are the same, or at least, that one may be substituted for the other.—(*Philips on the Vital Functions.*)

In many instances of loss of motion in the limbs, loss of sight, hearing, and other functions, resulting from paralysis of the nerves, we find that the function is restored instantly on sending the galvanic power through them. In some cases the effect remains only while the power is being transmitted, but in others we have the satisfaction of seeing a perfect restoration, after a deprivation perhaps of many years.

The experiments upon dead bodies are also valuable proofs of the same truth. Criminals, after execution, have been submitted to the action of galvanism, and the different parts of the body thrown into the most fearful convulsions by it. One whom

I saw myself opened his eyes and mouth, moved his limbs, and made evident attempts to rise from the table. It was the opinion of all present, that he would have fully revived, had not the neck been injured by the halter. Similar effects are frequently observed in the lecture room upon frogs, and others of the lower animals.

These experiments are very wonderful, explaining to us as they do, the nature of that mysterious power which produces our thoughts, feelings and actions. They are also extremely valuable, as we shall see further on, inasmuch as they indicate the true principles on which medical science should be based. They are also indispensable to our understanding the *causes of disease*, so necessary to be known in all cases before we can prevent them, and in many even before we can attempt their cure.

It is not our intention, nor is it needed, to enter fully into all the causes of disease, but still it is requisite we should do so generally, as a further illustration of the physiological facts we have stated, and as an explanation of some peculiarities in our mode of treatment.

CAUSES OF DISEASE.

The causes of disease are manifold and various. The greater part of them however are kept in operation solely by the general ignorance which prevails on the subject. Suppose any man in business were to leave every thing to be done as it were by chance, instead of by rule, and trust all to other persons, he need not be surprised, nor could he with reason complain, if he were to find himself

plundered and irremediably ruined, in a short time. Few men would act so foolishly in their business, and yet nearly all do so with what is of far more consequence, their health. They act as if it were not their business at all, forgetting that nobody else can be expected to concern themselves about it, except as a matter of profit, and that the profit is in proportion to the loss of health, and not its preservation. Many eminent medical men, with a disinterestedness that does them great honour, have endeavoured to direct attention to this important matter, the preservation of health, and prevention of disease. Hitherto, however, but few have listened, and fewer still have profited by their advice; nor could we reasonably expect them to do so, since it requires a certain amount of knowledge of ourselves to understand that advice, and such knowledge is seldom possessed. To begin this work aright every person should early possess a knowledge of his own structure, and the influence of external agents upon it, both for good and for evil. If such information were generally distributed most diseases would be prevented, and much advice that is now thrown away would be thankfully received and made good use of. Nor is such information at all difficult to give,—a small portion of the time now spent in learning many things of questionable utility, would be sufficient if rightly used. We have such efficient means of teaching the elements of anatomy and physiology at the present time, that such knowledge could easily be put within the reach of all. The excellent *anatomical models* now made so plentifully and so cheaply in Europe, will enable any one, with no previous knowledge

of the subject, to understand them sufficiently well in a very short time. The day is not far distant I trust, when all our public schools will be provided with these excellent articles, and when every youth educated there, will esteem the knowledge conveyed to him by their means, as the most precious gift his education has bestowed. Society itself would soon experience the benefit, and the truth would become apparent that, a small fraction of the means now expended in vainly attempting to *cure* disease, would, if rightly directed, prevent it altogether. A single simple fact would often enable a man to avoid a disease, which, if it becomes established, all the science of the day cannot remove.

It would be much better for all persons to have a moderate amount of knowledge, than for a few to possess a great amount and the remainder be ignorant.

A full knowledge of the various causes of disease will not be had till mankind are more awake to their true interests, and study that which really concerns them. At present we must confine ourselves to pointing out some of the more obvious causes, more particularly those that bear upon the new views that we wish to introduce.

Improper diet, hurried eating, the habitual use of stimulants, as alcoholic drinks, tobacco, and even strong coffee, may be enumerated as common causes of disease,—so, also, may exposure to cold and wet, bad air, whether in ill ventilated apartments or from decaying substances, unsuitable employments, injurious modes of dress, and excesses of various kinds. All these causes are more or less obvious, and people can understand you when you

speak of them ; but there are other causes far more injurious about which little is known, and which you can only enable those to see who know some little of themselves. This is especially the case with what we call *moral* causes ! They comprise all the various disturbances of the mind and feelings, which, by having a direct effect on the nervous system, always produce more or less of disease. The influence of the mind upon the body is commonly remarked, and most people are aware that various mental states affect the health to a very great extent ; but few know how far or in what way. People in robust health are apt to speak of disease in its primary stage, as being “merely a nervous affection,” or perhaps even consider it as “a whim,” or “a fancy,” or “imagination only !” But these nervous feelings are the most distressing that a person can experience, worse a thousand times than actual pain. Females are extremely liable to them, and often times they meet with but little sympathy, because the people around them think there is nothing the matter,—“it is only a nervous spell !” but if they were properly informed they would know that these nervous feelings indicate the first stage of *real disease*, and that, if suffered to continue, some organic derangement is nearly certain to ensue. When the organic derangement is obvious, medical aid is sought, but too often without any benefit, whereas, if proper steps had been taken in the early part of the first, or nervous stage, no organic derangement would have occurred.

Over exertion and agitation of the mind is one of the most fruitful causes of disease, in a civilized community. Every man possesses a certain amount

of nervous power to be distributed to the various organs in his body, to enable them to perform their functions ; but when he is continually occupied in thinking, the brain takes more than its share, consequently the other organs have not sufficient, and their functions are either imperfectly performed or not at all. Suppose, for instance, that a man of business takes a meal of food ; he is most likely thinking, all the time he is eating, about his affairs, and he rises from his table only to go to his desk ; his stomach however is filled with food, and endeavours to digest it, but, as I have previously explained, no gastric juice can be secreted unless a certain amount of nervous power be sent to the stomach, and this cannot be done, in his case, because all his nervous power is exhausted in thinking ! The food remains undigested, various uneasy feelings, or pains, follow, and eventually confirmed dyspepsia, for which he swallows a quantity of drugs, at a high price, and finds himself still no better. A man who exhausts all his nervous power in thinking can no more digest, than could the rabbit who had its nerves cut through, in Dr. Philips's experiments. This incessant worry of the mind, with its attendant anxieties, hopes and fears, is, I firmly believe, more productive of disease than all the physical causes I have mentioned put together ; and while this state of things continues, the physician will never want practice, nor will his treatment be more satisfactory than now. The human machine is supplied with a certain amount of power to keep it going, and if too much of that power be absorbed in any one part, the other parts must of necessity either stop or be weakened in their action.

My own impression is, that the greater part of our most incurable diseases are produced by moral causes, more particularly intense mental application, anxiety, hope, fear, and grief. I shall endeavour to show, however, that we may use neuro-pathic, or nervous remedies, in many of these cases, and with good effect too, though all others fail. My object in explaining more fully the causes of disease is, that the *rationale* of this neuropathic treatment, and other means operating only on the nerves, in such cases, may be seen.

CHAPTER III.

PRINCIPLES OF MEDICINE, AND CLASSIFICATION OF DISEASES AND REMEDIES.

General principles of medicine, drawn from the foregoing facts.—Natural classification of diseases.—Natural arrangement of curative agents.—Natural division of medicines, according to their effects on the system.—Real value of the present therapeutic and nosological classifications.

PRINCIPLES OF MEDICAL SCIENCE.

THE facts stated in our last chapter, establish the following principles, as the only true basis of medical science. Upon these we can found a natural classification of diseases and remedies, and a rational mode of treatment.

1st Principle. The action of every organ in the human body is caused by the nervous powers only; if that power be deficient, excessive, or irregular, so will their action be also, and if it cease they can act no more.

2d Principle. All disease, or irregular action, no matter where it may be situated, must originate in the nerves, the sole source of all action.

3d Principle. All curative treatment, to be effective, must act upon the nervous system, either directly or indirectly. And, consequently, those agents that act most directly on that system, as galvanism for instance, must be the most certain and efficient.

NATURAL ARRANGEMENT OF DISEASES.

CLASSES.

All diseases can be divided into two classes, *inflammatory* and *torpid*.

1st *Class*, or inflammatory diseases, are those in which we have excess of action, as in fever.

2d *Class*, or torpid diseases, are those in which we have deficiency of action, as in paralysis.

STAGES.

Every disease will also have two distinct *stages*, if it run its full course unchecked; the *nervous* and the *organic*.

1st *Stage*, or the nervous, is that during which the nerves only are affected.

2d *Stage*, or the organic, is that which follows the nervous, and in which the functions of the organs themselves, or even their structure, becomes affected.

FORMS.

A disease may also be presented to us in one of two forms, *acute*, or *chronic*.

1st *Form*, or the acute, is that where the disease is very intense. It usually comes on suddenly, and is short in its duration, as it either ceases altogether, ends fatally, or assumes the next form.

2d *Form*, or the chronic, is that in which the disease is mild but continuous. It usually follows

the acute, endures a long period, and then ceases, or again becomes acute.

This classification, simple as it may appear, is amply sufficient for our present purpose; and, with the addition of the name of the affected part, to designate its locality, would be complete enough for all practical uses.

NATURAL ARRANGEMENT OF CURATIVE AGENTS.

CLASSES.

Curative, or medical agents, may be divided into two classes, the *chemical* and the *neuropathic*.

1st *Class*, or chemical agents, includes all kinds of *drugs*, or *medicines*.

2d *Class*, or neuropathic agents, includes every thing that acts directly upon the nerves—*mesmerism* and *galvanism* for instance.

MODES.

Each class of agents may be used in two different modes. Thus, the chemical agents, or medicines, may be used either *allopathically* or *homœopathically*.

1st *Mode*. The allopathic mode is that in which medicines are used in appreciable doses, to produce certain obvious effects on the system—as when ipecacuanha is given to produce vomiting.

2d *Mode*. The homœopathic mode is one in which the medicines are given in minute doses, so as to produce none of the ordinary allopathic effects, but in which they are prepared in a peculiar manner that is said to endow them with new and superior powers.

The neuropathic agents may also be produced and employed in two different modes. The *natural* and the *artificial*.

1st Mode. The natural mode is that in which the neuropathic power belonging to one living being is made to act upon another living being—as in mesmerism for instance.

2d Mode. The artificial mode is that in which the neuropathic power, or one similar to it, is engendered by any artificial means, and made to act upon the system—as when we produce galvanism by means of a battery for instance.

NATURAL DIVISION OF MEDICINES, ACCORDING
TO THEIR EFFECTS ON THE SYSTEM.

Different authors have arranged the articles of the materia medica in different ways, according as their ideas varied respecting their properties. These divisions have been, for the most part, perfectly arbitrary, and scarcely two of them correspond in essential particulars; they are in fact chiefly *theories*, invented to cover the ignorance, or gratify the vanity of their authors. Thus we have diuretics and diaphoretics, epispastics and rubefacients, antispasmodics and sedatives, tonics and alteratives, and some twenty or thirty others; the difference between many of which, except in name, it would be difficult to determine. Many articles are placed in different classes by different authors, and many may be made to produce several effects by merely varying the mode of administering them. These systems of materia medica are akin to the fanciful catalogues of diseases, called nosological tables, and are equally useless. They have been rightly termed "*medical romances!*"

It no doubt sounds very learned to call home sickness *philopatridomania*—a cold in the head *phlegmatorrhagia*—and the head ache *cephalaglia*, or *cephalaponia*,—to use the word *psychrolutrum* for a cold bath, or *pediluvium* for a foot bath, but I cannot see the utility of it. People are imposed upon by these unpronounceable names, and sometimes injuriously. Many a man has swallowed mercury, under the name of *hydrargyrum*, without being aware of it; and many a dose of *rhea palmatum*

has been paid a high price for, the patient little thinking it was common rhubarb. When once this mania of word making seizes an author there is no telling where it will carry him; thus a celebrated author writing on the common disease *croup*, proposed that it should be called *laryngotracheite-myxopyomeningogene!*—He supposed this name had certain advantages over the common one, or even over the more scientific appellation *cynanche tonsillaris*—possibly it may, but I confess I am not aware of them. Some of my readers may be gratified by learning that the above disease belongs to the class *pyrexæ*, and order *phlegmasiæ!*

The real value of these wordy systems may be estimated, from the esteem in which they are held by medical men themselves; thus Dr. Forbes says, in the article already referred to, that it is requisite “to teach students that no systematic or theoretical classification of diseases, or of therapeutic agents, (medicines) ever yet promulgated, is true, or *any thing like the truth*, and that none can be adopted as a safe guide in practice.” The arrangement of medicines, like that of diseases, may be made extremely simple, and yet be practically useful, by noticing the actual differences in their effects.

CLASSES.

Medicines are naturally divided into two classes, *stimulants* and *sedatives*; corresponding to the two classes of diseases, inflammatory and torpid, to which they are adapted.

1st Class. Stimulants are those medicines which excite, or *increase*, temporarily or permanently, the

vital energy—as alcohol for instance. They are adapted to torpid diseases, where there is a deficiency of action.

2d *Class*. Sedatives are those medicines which *decrease* the vital action—as opium for instance. They are adapted to inflammatory diseases, where we have excess of action and wish to allay it.

Every medicine belongs to one or other of these classes, though some act more particularly on one part of the system and others on another,—some act quickly, and others slowly, a distinction of some importance when we remember the different *forms* of disease, *acute* and *chronic*. In our work on medical practice we shall extend and complete this classification, but the outline already given is sufficient for our present purpose of explanation and reference.

CHAPTER IV.

EXAMINATION OF THE DIFFERENT CHEMICAL SYSTEMS.

Allopathy, its variable character and uncertainty.—Necessity for a reform in it admitted by eminent medical men.—Testimony of Dr. Forbes.—The condemnation extends to all its varieties, both mineral and botanical.—Nevertheless medicines may be given with advantage allopathically, providing we know what to give, and when and how to give it.—If proper neuropathic remedies were used at the beginning of a disease, drugs would be but little needed.—When drugs are given, except in a very few cases, it should always be stated to the patient that their effect is uncertain; and the dose should be so small as not to injure.—The reason for this uncertainty is, the want of fundamental principles.—Our fundamental principles show that medicines should act on the *nerves*, to be effective.—Testimony of Liebig, and other authors in favour of this view.

Homœopathy—a system which is said to develop certain inherent powers of drugs, different from the ordinary ones, so that a minute dose may have equal effect with a large one given allopathically.—Probability of its truth to some extent.—Each system may, and ought to be adopted, under particular circumstances.—Philosophy of Homœopathy—probability of its acting galvanically.—Possibility of *one* simple substance being so endowed with the two cardinal medical properties, as to serve every purpose, merely by a difference in the mode of preparing it.—Probability of medicines being made to affect the system without our taking them at all—by galvanism!—Facts and reasoning in support of this view.

ALMOST every conceivable thing, animal, vegetable, and mineral, has been used at one period or other in the cure of disease, and cast by to make room for some more potent, or fashionable remedy. At one time we have such medicines as the flesh of the viper, or the dried skin of an Egyptian mum-

my—sometimes none but vegetable remedies are used—at others none but minerals.—One great doctor tells us that the more we take of a medicine, the greater will be the effect.—And another, equally great, assures us that this is a mistake, and that the most minute dose will produce more effect than the largest.—But still, different as all these various systems and medicines are, the fact is, as I have proved in my first chapter, they all produce much the same result, so that it is of little consequence which we resort to. Allopathy, Homœopathy, minerals, botanicals, and patent nostrums, are all equally uncertain, and have about an equal chance of doing good or harm. If there be any preference at all, it is certainly for Homœopathy, were it only because it interferes less with nature, and is not calculated to injure the system with large doses of poisonous drugs. The present practice of Allopathy is, beyond doubt, a serious evil, and probably produces more disease than ever it cures. Indeed its abuses are so glaring that many eminent medical practitioners and writers, as we have already shown, begin to speak loudly of the necessity for *reform!* In the article by Dr. Forbes, already quoted from, are enumerated the following things, which require to be done, besides those previously enumerated.

“To endeavour to substitute for the monstrous system of polypharmacy, now universally prevalent, one that is, at least, vastly more simple, more intelligible, more agreeable, and, it may be hoped, one more rational, more scientific, more certain, and more beneficial. * * *

“To inculcate generally a milder, and less energetic mode of practice, both in acute and chronic

diseases ; to encourage the expectant, in preference to the heroic system—at least where the indications of treatment are not manifest.

“To discountenance all active and powerful medication in the acute exanthemata and fevers of a specific type, as small pox, measles, scarlatina, typhus, &c., *until we obtain some evidence that the course of these diseases can be beneficially modified by remedies!*”

“To discountenance, as much as possible, and eschew the habitual use (without any sufficient reason) of certain powerful medicine in large doses, in a multitude of different diseases, a practice now generally prevalent, and fraught with the most baneful consequences. * * * Mercury, iodine, colchicum, antimony, also purgatives in general and blood letting, *are frightfully misused in this manner!*”

“To encourage the administration of simple, feeble, or *altogether powerless*, non-perturbing medicines, in all cases in which drugs are prescribed *pro forma*, for the satisfaction of the patient’s mind, and not with the view of producing any direct remedial effect. * * *

“To make every effort not merely to destroy the prevalent system of giving a vast quantity and variety of unnecessary and useless drugs, (*to say the least of them,*) but to encourage extreme simplicity in the prescription of medicines that *seem to be requisite.*”

These are a few of the reforms suggested by one of the first allopathic practitioners and writers of the present day, and coming from the quarter they do, we cannot doubt that they are really needed.

Many other authorities, equally eminent, could be given, all bearing testimony to the evil of this incessant drugging, which has, there is no doubt, actually *produced* numerous diseases now prevalent, weakening the human constitution, and, in many cases, prevented nature from effecting a cure. This condemnation, be it remembered, is not levelled at any particular kind of drugs, as minerals for instance, but at all that are active. Botanic remedies are generally supposed, and by some are represented to be, less dangerous than mineral ones, in fact almost harmless. This, however, is far from the truth. Some of the most active articles in the materia medica are vegetable products, though not generally known to be so; indeed most plants owe their medicinal powers simply to the minerals which they contain. A great deal of ignorance is often exhibited on this subject, and much deception practised. A short time ago I consulted with a botanic physician, respecting a patient to whom I recommended a small dose of prussic acid, and I shall never forget his reason for objecting to it. "I don't like," said he, "any of your strong chemical poisons, I always use herbs only."—And yet this same man gave, to the same patient, a preparation of *laurel water*, and with good effect, without being aware that the laurel water owed all its powers simply to the prussic acid it contained! All medicines that are powerful enough to produce a decided effect on the system may injure, no matter whence they come.

Nevertheless, though medicines are a great evil as now used, they may be in many cases of great service, even when administered in the ordinary

way. Nature may often be *assisted* by them in her attempts to remove disease, or the system may be supported by them till its own innate powers effect a cure.

At the present time, however, drugs are used indiscriminately in all diseases, and at all stages of a disease, which is a great error. They are applicable for the most part only in certain diseases, and at particular periods. In the primary, or nervous stage of any disease, medicines are seldom of use, indeed they are often hurtful, tending to exasperate it and bring on the second, or organic stage. So long as there is only nervous derangement, we should use the remedies called *neuropathic*, as galvanism for instance, except in a few cases, where poisonous matter has found its way into the system, and we wish to counteract its effects chemically. Even in the second stage, where we have organic derangement, drugs are but seldom needed, except at a late period when the tissues, composing the structure of the body, are being destroyed by corrosive action, as in scrofula. But let them be given whenever they may, except in a very few instances, the physician should always tell his patient, if he wishes to deal honestly, that the effect is very uncertain. There are a few medicines whose effects we can foretell, in certain diseases, with tolerable certainty, but with the greater number this is not the case. Sometimes the smallest dose will produce as great an effect, as the largest dose will at others; and sometimes one remedy will act upon quite a different part of the system to what it does at others, but what causes these different effects we cannot always tell. The common

Antimonial or fever powder, for instance, is usually given in from *three to ten grains* as a dose, and generally produces copious perspiration, thereby relieving the fever,—but this remedy has often been given in as large a dose as *one hundred grains* with no effect, at all! Similar uncertainty exists with respect to most other medicines. A physician is only justified in saying, that the medicine he prescribes *usually* produces such or such an effect, in similar cases, and he *expects* it to do so again; but he can by no means be certain of it. It should therefore be an invariable rule with him to so reduce his doses, at first, so as to avoid the *possibility* of doing injury, otherwise they may produce a greater evil than the one they are intended to remove. I have already stated that the present system of giving medicines is one of chance, or guesswork, simply because it is based on no fixed principles. We have, however, established certain principles, upon which their administration should be based; and which, if acted upon, will remove this uncertainty.

Our third fundamental principle states that “All curative treatment, to be effective, must act, directly or indirectly, on the nervous system!”—and the physiological facts we have given prove this to be true. Now some drugs affect only the nerves in certain parts of the body, while others affect them generally, and it requires an accurate knowledge of the neuropathic effect of any medicine to administer it with certainty. This knowledge is only possessed with regard to a few articles, and these we can use with a prospect of benefit, but with the others it is hap hazard.

The fact that medicines act primarily on the nerves, is but recently discovered; it is however to be found stated in many medical works of recent date, though sometimes obscurely. In a work lately published on the *Materia Medica*, by Edward Ballard, M. D., and Alfred Baring Garrod, M. D., London, it is fully admitted, and made the basis of much good reasoning. The celebrated chemist Liebig has recently discovered that the vegetable alkaloids, quina, brucia, morphia, &c., now so extensively used in medicine, are strictly analogous in their composition *to the substance of the brain and nerves*, while these resemble no other elements, so far as we know! This is a curious and important fact, when we recollect the decided and powerful action of these medicines on the nervous system,—as that of quina in ague for instance. The supposition becomes at once extremely probable, that the diseases in which they are so useful result from some decay, or want of nourishment, in the brain and nerves, and that they effect the cure by supplying that nourishment. Messrs. Baring and Garrod favour this view, for they remark that these substances may be “*supposed to take a share in the formation of new, or the transformation of old brain and nervous matter.*”—Further on it is said, “Medicines, therefore, which affect secretion, must do so in one of two ways: either they must act *upon the nervous centres*, increasing or diminishing their influence upon the organs, and modifying the circulation through them, or, in the words of Liebig, ‘they must take a direct share in the change of matter in the body,’ or ‘exert an influence on the formation, or on the quality of a secretion, by the

addition of their elements.' ”—And in speaking of the class of medicines called stimulants they say, “ We do not hesitate to express our deliberate conviction, that every stimulant which augments the activity of the general functions of the body, does so *by the influence, primary or secondary, which it exerts on the cerebro-spinal centres.*” With respect to the class called sedatives, it is remarked that, “ just as the alkaloids of *nux vomica* operate as specific stimulants upon the excito motory function of the spinal cord, so there are some medicines which, in an equal degree depress it.”—The reviewer of this book in the *London Lancet*, praises the work, but points out a few deficiencies ; among other things he thinks that “ the nature of the nervous actions induced by various remedies, and the therapeutic action of the *vis nervosa*, (nervous powers) are not so specifically referred to as they might with propriety have been.”—This is precisely my doctrine, and before long it will be universally acknowledged.

It was nothing but a gradual perception of these truths, and the obvious evils of allopathic practice, that originated Homœopathy ! This is a system which makes no use at all of the ordinary allopathic powers of drugs, but depends upon certain mysterious dynamic, or *spiritual* powers, which they are supposed to possess. These new powers are developed, it is said, by the peculiar process of preparation which homœopathic medicines undergo, and are so subtile, but still so active, that a dose of any article, inconceivably small, can produce more curative effect than the largest dose given in the ordinary way. They are supposed, in fact, to act

upon the *spiritual*, or *nervous* powers, and not upon the mere *materiel* of the system. If they do so act, the system is strictly philosophical, and may be much more *active* than is ordinarily supposed, as will be evident from the explanations we have given. Without such an explanation Homœopathy must appear an absurdity, and I am only surprised that its professors have not enlightened the public on so important a point; but since they have not done so I am compelled to do it for them.

The possibility of Homœopathy being true is thus made evident, and without stopping here to argue its *probability*, or to weigh the evidence for and against it, we will merely remark that it has been shown to be fully as curative as allopathy; we are therefore bound to admit either that new powers *are* imparted to its minute doses, by their process of preparation, or else that allopathic doses are equally devoid of curative effect. For my own part the evidence presented to me has not been sufficient to prove Homœopathy, as a system, decidedly true, but still I am ready to admit that I have seen instances which seemed to prove it to be really active, and its *fundamental* principle is undoubtedly correct. As I have already stated, I would prefer Homœopathy as it is, to allopathy as now practised; but there is so much uncertainty in both that I think it wrong to adopt either system exclusively. So long as medicine is, in so great a measure, merely experimental, we should be willing to try any thing that has the slightest claim on our attention. The good of the patient, and not the supporting of any particular system, should be the motive to our exertions. That all material substance are under the

sole influence of that mysterious power we call galvanism, or electricity, has been already proved; and also that this power is analogous to that which we call the nervous, by which we live and move. It has further been shown that all disease originates in the nerves, and that all medicines, to be effective, must act upon them in one of the two following ways; as *sedatives*, to decrease excessive action, or, as *stimulants* to increase it when deficient. It is probable that they do so on this principle.—A sedative medicine possesses *less* than its natural endowment of electric power, and has a tendency to make up the deficiency, by absorbing some from any other body which has an excess, or a less power of retaining it. When it is given therefore in inflammatory disease, it effects a cure by absorbing the nervous (or electric) power which is in excess, and so restoring the proper balance. A stimulant medicine acts the reverse way. It possesses *more* than its natural endowment of electric power, and when it comes in contact with any part of the system that has too little, or is *torpid*, it parts with its superabundance, and so supplies the deficiency.

The question then comes, whether we can by any means decrease or increase the amount of electrical or nervous power, in medicines, so as to make them act either way at our pleasure, and without producing the common allopathic effects. I am decidedly of opinion that we can, though I do not think we are, as yet, acquainted with the best means of doing it, with certainty, or to such an extent as is required. The Homœopathists give their medicines a certain number of shakes, and a certain number of grindings in the mortar, during a certain time,

and effect their dilutions by arithmetical rule, in order to give them their peculiar dynamic or spiritual power; and this mode must of course answer the purpose, to some extent, if they have any power at all. Nor is it at all difficult to explain how this power is derived. In the first place we have more or less chemical action; we have motion; and we have violent separation of particles of matter in a state of cohesion, by the grinding process; and we know by experiment that by either of these processes galvanic action is produced. But still we want a better process; one that will give us more power, with more certainty. Homœopathy is probably *as good* as allopathy, even in its present imperfect state, but it is capable of being *much better*, and will eventually become so. All that is wanted is, the discovery of this new and improved process, and which, I think, is about to be made. The suggestion naturally rises in the mind, that either the galvanic battery itself, the electrical machine, or the magnet, may be made to influence the medicines during their preparation, so as to impart the desired power in a *direct manner*. This has often been tried, but not by acting on any known principle; still sufficient success has attended the attempt to show that the idea is correct, and that it only needs a systematic perseverance, and close observation, to lead to a discovery of some certain rule, which will make success certain in all cases.

I have tried numerous experiments of this kind myself, and the result has satisfied me of the correctness of this conclusion. Many substances that have no medicinal power at all in their ordinary state, have acquired that power, in an extraordinary

degree, by being placed, in a certain manner, in the galvanic circuit. I think it of little consequence what article we use, and am confident that a most minute portion, of the simplest and most inactive substance, may be so affected, by being submitted to proper galvanic, electric, or magnetic action, as to act either as a stimulant or a sedative, equally as well as a homœopathic medicine, and often better than an allopathic one. We do not require a great number of different medicines, if they all act on the same principle, as I have shown they do; *one article*, and that of the simplest kind, may be made to possess either of the two cardinal medicinal powers, *stimulant* or *sedative*, in any degree we please, merely by a difference in the mode of its preparation. We can either give it a superabundance of galvanic power, so that it may impart it to the nerves, and thus stimulate them when torpid,—or, we may deprive it of its power, so that when it comes in contact with them, in an inflammatory state, it will absorb their superfluous power and act as a sedative; that is to the system generally, or the brain and spinal marrow. We may still need different medicines in particular cases, as some act locally on the nerves of particular parts.

I have frequently, with a minute dose of the same simple substance, perfectly inactive in its natural state, produced both these effects, and I would venture my life upon the result of the experiment, that, with this one harmless substance, properly prepared in the two different modes, as many cures could be effected as with all the powerful drugs in an apothecary's store; though the quantity given would be, apparently, too minute for any effect whatever to

follow. To Homœopathists, who understand fully the principles of their great founder, this will not appear strange at all, but merely a legitimate deduction from those principles. Hahnemann taught that in disease the spiritual (or nervous) power was affected, and that medicines must have their spiritual (or galvanic) power developed, to enable them to act on the spiritual power of the system, which is the same doctrine essentially as that I have laid down. It follows from this, as a matter of course, that *any* substance to which he can impart this spiritual or galvanic power, may be made medicinal, and that, consequently, *one simple substance may stand in place of all the drugs now used*, as a general stimulant, or sedative. All that we want to discover is, the readiest and most effective mode of imparting this power; we can then use any harmless substance that comes in our way. This discovery is partly made, and will, I have no doubt, soon be complete.

I am aware that many persons may deny the truth of this, and that others may ridicule it, but that is of no consequence—every thing new is liable to be treated the same. It has always been so, and probably always will. I have proved it, to my own satisfaction, to be true, and, believing it to be a useful discovery, it becomes my duty to announce it, without considering the consequences to myself. At the present time we see many striking results produced by agents altogether unknown to us, except by their effects, as in the magnetic telegraph for instance. We are nevertheless fully satisfied, if those effects are produced, that the power is an adequate one, though we cannot exhibit it as we

do gross physical agency. So it is with the remedies I have spoken of, if they effect cures that is sufficient, no matter how inoperative they may be supposed to be, nor what is said of them. In the words of Hahnemann, "Empty declamation must give way before the might of infallible experience!"

These new views will ultimately force themselves upon the attention of Homœopathists, as well as others, and produce a great change in their system. Their present long list of different medicines will be cast aside, and a few simple substances, perhaps only one, be used in their stead. The Homœopathic Materia Medica, as now existing, is founded, for the most part, on the supposed *allopathic* properties of the different articles, though the cures are supposed to be effected by the *new* powers imparted by the process of preparation. The inconsistency is evident, but we cannot expect that the trammels of the old system could be cast aside all at once. Hahnemann made a grand discovery, and was a bold innovator; his system has already done much good, and will eventually lead to much more.

I have yet, however, another discovery to announce, which will throw the *minute* doses of Homœopathy into the shade, and meet with more incredulity probably than they have done. I have no doubt, however, either of its being as real, or, that it will eventually be as generally received in practice. It is neither more nor less than this, that

The effects of medicines may often be produced without taking them into the system at all; particularly those that act generally!

Before I explain *how* this can be done, I will first tell how I was led to think it possible. I had

often heard the remark made by those who administered galvanism to diseased persons, that, if the operator and patient clasped hands, so that the galvanism passed through both at the same time, the operator would often appear afterwards to be affected the same as the patient! Subsequent observation proved this to be true, and satisfied me that sensations, if not disease itself, can be transmitted in this way. While thinking over this curious circumstance, I recollected also how the decomposition of chemical compounds, and the transmission of their elements, was effected by galvanic agency, and the two facts at once associated themselves together, and gave rise to several reflections and experiments.

For instance; if we put in a tumbler a solution, in water, of sulphate of copper, which is a chemical compound of sulphuric acid and copper, and connect it with two other tumblers, one on each side, and each containing pure water, by means of a bit of moistened asbestos, dipping over the edge of each tumbler into the fluid within; and then put the wire from the positive pole of a battery into one of the outside tumblers, and the negative in the other, we shall find that the transmission of the galvanic current will decompose the sulphate of copper, and that the sulphuric acid will pass to the one outside tumbler, next the positive pole, and the metallic copper to the other! If two human beings be placed, each with the fingers of one hand in the centre tumbler, and those of the other in an outside one, in place of the asbestos, the transmission will often take place by means of their bodies, particularly if they are moist. I have often proved this, by the fact that many persons can distinctly taste

the copper, when they form one part of the circle, and the acid when they form the other. The effect is so strong in some cases as to almost produce vomiting, when the transmission took place through the nerves of the stomach, or tongue.

Thus we have, in the first place, the sensations of one individual conveyed to another, by this mysterious agent,—in the second place it decomposes a chemical compound, and transmits its elements to separate receptacles,—and thirdly, it conveys these elements through the human body, so that they produce their characteristic effects upon it without remaining there. The question then arose in my mind, from these facts, whether a similar result would follow a similar use of other medicinal substances? And subsequent experiments have satisfied me that it will with many, and made it highly probable that it will with all. If this be so it is highly important, since it will enable us to affect the system by any medicines we choose, without actually taking them; we thus gain all their benefits without risking any of the evil consequences of their entering into, and afterwards remaining in the body.

To those who understand the action of the galvanic current, this will not appear so extraordinary as it will to others. We have stated in our last chapter, the great probability there exists, that medicines act by means of certain mysterious powers, called *spiritual* by the Homœopathists; and as those have a natural affinity for the galvanic, it is highly probable they pass along with it through the body, and operate upon it while doing so. The experiments I have as yet tried have been chiefly with mineral compounds, but I have little doubt that other sub-

stances will give corresponding results. Indeed, I have known it to do so in many other instances. A person once became drowsy, and ultimately fell fast asleep, when the galvanic current was sent, first through a strong solution of opium, and then through his body. The same person complained of sickness at the stomach, when the solution was changed to one of ippeacuanha. I have now several patients under my care to whom I give no medicines, but merely put them in connection with them in this way, and the result so far has been highly satisfactory. I am strong in hope, myself, that this discovery will be fully verified, and that it will be of immense benefit to suffering humanity. The time probably is not far distant when we shall derive all the good from medicines that they are capable of accomplishing, without any of those frightful evils that have hitherto resulted from their indiscriminate and improper use. All must wish for such a result, and it is the duty of all to endeavour to obtain it, without permitting any unworthy feeling to blind their judgment, or harden their hearts.

CHAPTER V.

ILLUSTRATIONS OF NEUROPATHIC AGENCY—CHIEFLY NATURAL AND INDIRECT—AND ITS PROBABLE VALUE IN THE CURE OF DISEASE.

Charms, incantations, and exorcisms.—Undoubted success of such means of cure in many cases.—Their effects probably produced, in a great measure, by faith and hope, but not exclusively.—Probability that they called forth the mysterious power which animates the universe, and connects us with all surrounding things. Proofs of this connection.—Baron Reichenbach's experiments, and others.—Reflections upon these experiments, and the practical results to which they may eventually lead in the treatment of disease.—Mesmerism, its origin and history.—Its great antiquity.—The chief persons who have practised it.—Opposition it has met with.—Mesmer and the Academy of Sciences.—Report of the first Committee appointed by the Academy to examine Mesmerism, and what effect it produced.—Second Committee, their Report, and its reception by the Academy.—Facts elicited by the Committee.—Subsequent history of Mesmerism, and recent facts.—The claims of Mesmerism on our attention, and its positive and probable value.

THE employment of neuropathic agency is of very ancient date; probably it preceded the use of medicines a long period. Charms, incantations, appeals to their divinities, and exorcisms, were the first means used for removing disease. That they were frequently efficacious, there can be no doubt; nor will it appear at all strange for them to be so, when we recollect the all powerful influence exerted by the mind over the body, even if no other agency be allowed. In a rude, barbarous age, the power of these remedies was unquestioned, and

the confidence felt in them was alone sufficient to rally the sinking patient, and support him through the severest suffering. During the employment of these means nature was not interfered with, but rather assisted, and probably the chances of recovery in many cases were greater than when more scientific means are employed. Even when medicines came to be used, many of the old processes were connected with them. Thus herbs were gathered *under the sign*, and all remedies were compounded with certain forms and ceremonies, otherwise they were thought to be inefficient. Even now these ideas are entertained by uninformed people, and the influence of *the stars* upon human health, and upon medical plants, is firmly believed.

History gives us accounts of many curious medical superstitions, the study of which teaches us a valuable truth. Although at the present time we do not believe in them in the same way that our ancestors did, yet we cannot deny that they were often successful, and we now see in them only so many proofs that *every disease can be affected through the nerves*. It was chiefly the full faith in their efficacy which roused the nervous energies, through the medium of the mind, and accomplished the cure. Without that faith they were mostly powerless; with it they were usually omnipotent. At the present time, ignorant people can be influenced in precisely the same way, and a physician who has tact enough to inspire full confidence, will often do more good without medicines at all, than another who has the whole materia medica at his command, but is *not believed in*.

Sometimes we read of the sick being healed

by a little amulet, or relic, placed over the heart, or dipped in a cup of water. Sir W. Scott gives an excellent illustration of this in his tale of "The Talisman." Sometimes the touch of a person believed to be endowed with healing powers, was relied upon, as in the case of the kings of England, who used to touch those afflicted with scrofula, from which it was called the king's evil. In some cases it was not the patient who was operated upon, but an image of him, made of clay or wax, which was subjected to various curious ceremonies and processes, by which it was supposed the individual himself was affected. Many persons have been condemned to death for *causing* disease in others by similar means. In the middle ages it was the common practice, in case of wounds, to apply the medicine to the weapon that inflicted the injury, and not to the wound itself; this mode of using it being believed the most potent. No matter what was the process, it was, for the most part, the effect upon the mind that accomplished the cure; or, in other words, the nervous system was operated upon by that most powerful neuropathic agent, *faith*.

But powerful as these mental effects were, it is highly probable that they did not operate alone. That subtle power which pervades the whole universe, and whose manifestations we observe in every phenomenon that occurs, was probably called into play in many instances. What we term galvanism, electricity, magnetism, light, heat, and the nervous fluid, are but modifications of that power which is the sole cause of all action whatever, organic or inorganic, and is developed in every change that occurs. It is highly probable that

many of those forms and ceremonies practised by magicians, and healers of the sick, in ancient times, and by mesmerisers now, are in reality scientific manipulations, and merely appear to us to be deceptions or impositions because we do not understand their mode of operation. We are now acquainted with numerous facts which none of our sciences can explain, relating to the mysterious connection which evidently exists between all human beings, and between them and surrounding objects. This connection is proved by many facts independent of those ordinarily termed mesmeric ones, some of which we will refer to. During last summer Baron Reichenbach, of Vienna, published an account of some very curious experiments on magnetism, which attracted considerable attention. Similar experiments to some of them had been tried before, but others were quite new. As far as possible they have been tested here, and those that have been proved true will be presented as facts, the others merely on the authority of the Baron himself. It is well known that a machine may be made with magnets to produce similar effects to the galvanic battery, or the electric machine, but the simple magnet itself is generally believed to be without effect on the body. The Baron's experiments, however, show that this is not the case. The "Dublin Quarterly Journal of Medical Science," has an abstract of the German account, from which we make the following extracts.

"If the poles of a strong magnet, capable of supporting the weight of about ten pounds, be passed over the bodies of fifteen or twenty persons, there will always be found some individuals among them

who are affected by it in a very peculiar way. The number of such persons is much greater than is generally supposed. Of the above number, there will be three or four at least. The nature of this impression on sensitive persons, who, in other respects, may be looked upon as perfectly healthy, is not easily described, being rather disagreeable than pleasant, joined with a slight sensation, now of cold, and now of heat, as if the person were blown upon by a cold or lukewarm current of air. Sometimes they feel contractions in the muscles, and a pricking sensation, as if ants crawled over the body; and many persons even complain of sudden headaches. Not only women, but even young men, are sensible to this influence; and in young children the sensation is very strong.

Actually or apparently healthy sensitive individuals discover, in their relation to the magnet, nothing besides the sensation just described. But the case is very different with the sick sensitive. Its action on them is sometimes agreeable, sometimes unpleasant—often disagreeably painful to such a degree, that fainting, cataleptic fits, and spasms, at times violent, and sometimes dangerous, ensue, according to the nature and degree of their disease. In this latter class, to which the somnambulists also belong, an extraordinary increase takes place in the sensitiveness of the senses. 'The patient sees, tastes, and feels better than others, and often hears what is said in the next room. This is, however, a fact well known, and is not by any means unnatural.'

One of his patients, a young woman subject to nervous spasms and cataleptic fits, was able to see light emanating from the magnet.

“The experiment was performed in a perfectly dark room. At the distance of about ten feet from the patient was placed a horseshoe magnet of nine plates [a magnet of nine plates of alternate metals, bent into a horseshoe form, so as to make the ends or poles approach,] weighing about eighty pounds, with its poles directed towards the ceiling. Whenever the armature of this magnet [a piece of iron, connecting the poles of the magnet] was removed the girl saw both poles of the magnet surrounded by a luminosity, which disappeared whenever the armature was connected with the poles. The light was equally large on both poles, and without any apparent tendency to combine. The magnet appeared to be immediately encircled by a fiery vapour, which was again surrounded by a brilliant radiant light. The rays were not still, but continually flickered, producing a scintillating appearance of extreme beauty. The entire phenomenon contained nothing which could be compared to a common fire; the colour was much purer, almost white, sometimes mixed with iridescent colours, and the whole being more similar to the light of the sun than to that of a common fire. The rays were not uniformly bright: in the middle of the edges of the horseshoe they were more crowded and brilliant than at the angles, where they were collected into tufts, which extended further out than the other rays. The light of the electric spark she considered much bluer. It left an impression on the eye similar to, but much weaker than, that left by the sun, and which did not disappear for several hours, and was transferred to all substances upon which she looked for some time in a painful manner.”

Other persons observed similar phenomena, and in some they were very vivid. To prove more fully the reality of this light, it was concentrated in a lens, and even made to act on a daguerreotype plate. Not the slightest heat could be detected by the most sensitive instruments. Reichenbach considers the aurora borealis to be nothing more than this magnetic light. It has, however, many properties in common with the light of the sun, making it probable that there is no very material difference between them. It is intercepted by opaque bodies, and transmitted by transparent ones. Some of the patients could see surrounding objects by it, and point out the focus of the lens with exactness.

Some other experiments illustrating the power of the magnet, and showing that it resides in other bodies, are still more curious. The Dublin Journalist thus describes them.

“From the observations of Petelin, made at Lyons in 1788, and which were afterwards verified by many others, we know that, in catalepsy, the hand is capable of being attracted by a powerful magnet, just like a piece of iron; and, as Mesmer observed, that water over which a magnet has been several times passed, can be distinguished from ordinary water by sensitive patients. Reichenbach has fully verified these facts in a large number of persons. He found that this effect took place not only during perfect catalepsy, but even afterwards, when the persons were in full possession of their senses. Miss Vowotny described the sensation to him as an irresistible attraction, which she felt obliged to obey, though against her will; that it was a pleasant feeling, combined with a cool gentle aura,

which flowed over the hand from the magnet, the former feeling as if tied and drawn to the latter by a thousand fine threads; and that she knew nothing similar to it in ordinary life, it being a peculiar indescribable feeling of refreshing and extraordinary pleasure, particularly if the magnet attracted the right hand, and was not too strong.

He did not, however, verify Thilorier's observation, that nervous patients can convert needles into magnets; and he considers, in fact, the attraction of the hand by the magnet to be of a totally different nature from that between iron and the magnet. This opinion we shall see verified further on.

We have had no instance hitherto of the form or arrangement of the molecules of a body rendering it capable of exerting force on other bodies at a distance; but Reichenbach, by a series of experiments on magnetic water—that is, water over which a magnet has been several times passed—was led to suppose that other bodies could, in all probability, be also rendered magnetic. This he soon found to be the case in a greater or lesser degree; but he also observed that many substances, which were never in contact with a magnet, affected the nerves; and by extending his experiments, he arrived at the law that amorphous bodies possess no power similar to that possessed by the magnet, but that crystals are capable of producing all the phenomena resulting from the action of a magnet on cataleptic patients. This is true, however, only of single perfect crystals, and not of an agglomeration of crystals, such as lump sugar. Thus, for instance, a large prism of rock crystal, placed in the hand of a nervous patient, affects the fingers so as to make

them grasp the crystal involuntarily, and shut the fist.

This power is not equally distributed over every part of the surface of the crystal, but is found to concentrate itself in two points or poles corresponding to the principal axes of the crystal. Both poles were found to act similarly; but one was generally somewhat stronger than the other, with the exception that one gave out a cool, and the other a lukewarm gentle aura."

It was found, however, that this magnetic power of the crystal, differs from that of the ordinary magnet in many particulars. Thus it does not affect the needle, nor attract iron filings. Reichenbach supposes that the magnetism of the human body and of crystals is the same, and that it is different from that of the ordinary magnet. But there appears no good reason for the supposition: it is much more probable that they are the same essentially, only modified by some peculiar circumstances with which we are unacquainted. We can engender galvanism in plates of metal by heat alone, or even by motion, and make needles magnetic by the light of the sun, but they all exhibit the same effects as if their powers were produced by the ordinary means.

The different poles of crystals could be detected by many of the patients with the greatest readiness, so that they could distinguish minerals and ores from each other immediately, though they had no knowledge of mineralogy. Sometimes a light was seen to emanate from the poles of the crystal the same as from the magnet, and to present similar peculiarities.

In all these experiments it should be borne in mind that the crystal was simple, and large, and the experiments conducted in a dark room.

It was also observed that the magnetism of the earth had a remarkable influence in many instances. Thus nervous patients nearly always feel better when they lie, or sit, with the head towards the north, or in the direction of the magnetic meridian, and become worse when their position is from east to west. This I have also seen myself, and have known the wrong direction almost produce convulsions. The placing of the beds, and the manner of sitting, of nervous patients, is in fact an important part of their treatment. The effects of galvanism and electricity are also very different, according as we place the patient while operating; and many failures, and unfavourable results have probably arisen from ignorance of this.

All the foregoing experiments I have tried over and verified myself, besides discovering some new facts of the same kind. The influence of the magnet upon water is often very strong, so that a patient can distinguish that which has been operated upon immediately. Many other substances, particularly medicines, can also be affected by it, and new properties imparted to them. This is in fact one of the principles upon which the preparation of the galvanic or magnetic medicine depends, which we mentioned in our last chapter. I have also ascertained that a peculiar effect is produced on human beings by pointed bodies of almost any kind, but more particularly metallic ones. Thus if a number of persons hold the point of a penknife about a quarter or the eighth of an inch from the head, just

between the eyes, and draw it gently backwards and forwards, some of them will always experience a peculiar sensation. Most usually it seems as if the skin was being drawn tight together over the forehead; the head feels heavy, the eyes have a tendency to close, and frequently headache follows, though sometimes it is relieved by it. Any metallic point will answer, and with some persons even wood and other substances, or the fingers of the hand. The sensation is at times so strong that it will last for hours after.

In some cases of spinal, and other diseases, I have employed a steel point to discover the precise spot that was affected, the patients declaring they could feel the sensation immediately over it much more acutely. In fact I rely on this, in many cases, as an excellent mode of detecting disease, and, when its indications are better studied, it will be found superior to one-half the diagnostic rules that now cumber our medical books. The use of metallic points in the cure of disease is deserving of more attention than it has lately received; but I must leave further consideration of this till the next section.

Some of the experiments which follow I have not had an opportunity of trying so conclusively as I could wish, though I feel no doubt of their correctness. The difficulty is in procuring patients sufficiently sensitive, to exhibit the human magnetism, which the baron refers to, sufficiently strong. I have however seen some persons who exhibited it unequivocally, to a certain extent.

“ In extending his experiments, he found that soft iron, which loses its magnetism when removed

from the inductive power of a magnet, does not lose the power of acting on the nerves; and he hence concludes that magnetism, properly so called, is perfectly distinct from this new power, as we have already seen in other instances, when speaking of the crystal. We have also mentioned that bodies placed in contact with a crystal or magnet, such as water, &c., became possessed of the same power of affecting the nerves as those bodies, and could be distinguished from portions of the same substances not magnetized. But we have now to learn that the same properties can be communicated to the human body; or, in other words, that a man rubbed, or in mere contact with a magnet or crystal, is capable of producing the same effect on the nerves as those bodies; nay more, that a man has these properties even when he has not touched a magnet or crystal; in fact, that we are a source of this peculiar power ourselves. It is unnecessary to give here the mode in which he arrived at this remarkable conclusion, as the experiments are all similar to those made with the magnet and crystal—a man being merely substituted for these latter. Like them, the hand produces an aura, attracts the limbs of cataleptic patients, and communicates a charge to other bodies which, as in the case of the magnet and crystal, disappears again in a short time; and is capable of passing through all bodies, is little influenced by the magnetism of the earth, and like them, is polar, the principal axis being across the body, the ends of the fingers being the poles. The head and genitals very likely form secondary poles.

“ But the most extraordinary part of the whole

investigation is, that the tops of the fingers of healthy men continually give off tufts of light, just as the poles of crystals, while those of women give off none, or at most merely appear slightly luminous! The patients who were able to observe these phenomena, described the flames as being from one to four inches long, according as they were more or less sensitive, and of an extremely beautiful appearance."

Another of his experiments was for the purpose of demonstrating that there is magnetism in the sun's light. It was conducted thus,—

"To a piece of thick copper wire, about thirty feet long, he fastened a piece of sheet copper, about nine inches square. The end of this wire was placed in the patient's hand, and the plate exposed to the direct rays of the sun outside the window: this was scarcely done, when an exclamation of intense pleasure was heard from the patient; she instantly felt the peculiar sensation of warmth, which gradually spread from her arm to her head. But, in addition to this, she described another and hitherto totally unknown sensation; namely, a feeling of extreme well-being, as the patient said, similar to the sensation produced by a gentle May breeze. It flowed from the end of the wire to the arm, and spread itself over the whole body, producing a sensation of coolness; the patient feeling at the same time strengthened and refreshed. In some of his experiments, Reichenbach substituted various bodies, and among them a man, for the plate of copper, and still obtained the same results."

Some excellent remarks are also made respecting the sources from which this subtile power proceeds.

The slightest chemical action is sufficient to develop it, "even where it consists in nothing more than the combination of the water of crystallization with a salt, or mere solution of some body in a solvent."—And,

"If we recollect," says our journalist, "how manifold are the circumstances under which chemical action takes place on the earth, we will be able to see what an inexhaustible source of this power there must be. In the animal body, there is a series of such changes continually going on; we eat food, it is digested in the stomach, and converted into blood, which is again further changed into muscle, fat, &c., and these in turn again decomposed, to yield fuel for animal heat and motive power. This continual chemical action is, therefore, the generator of the peculiar force which we find developed in man, as in the magnet and crystal. But not only does the chemical action going on in the living body generate this power, but the decomposition which ensues immediately after death is also an abundant source of it. Reichenbach, on going into churchyards on dark nights with some of his patients, discovered that graves were always covered with a lurid phosphorescent glow, about six or eight inches high; and in one case Miss Reichel saw it four feet in height in a graveyard in Vienna, where a large number of persons were daily buried. When she walked through this graveyard, the light reached up to her neck, and the whole place appeared covered with a dense misty luminous fog. This, the baron conceives, explains in a very satisfactory manner the appearance of light and ghosts, &c., which have been from time to time observed over graves."

It was also observed, in the experiment on the magnetism of light, that the greatest effect was produced in the violet ray, and this is the one which has the greatest *chemical* action also.

There are two other facts which it appears to me may have a bearing upon this subject of luminosity of the body. It is well known that *phosphorus* is one of the elements of the nervous substance, besides being found in the bones. It is also found in many other animals, and has been thought to be the cause of the luminosity which many of them exhibit. If this be so it may be concerned in the luminosity of the human body, both before and after death, and may also throw a light on the much disputed question of spontaneous combustion, which is so confidently averred by some to have occurred. Another curious fact is this, it has often been observed that the breath of many persons, just before they die, has a peculiar odour, *like phosphorus*, and some physicians rely on this as a certain sign that death will ensue. In the London Lancet for March, 1846, is a communication on this subject, in which the author says this odour has been so strong, in some cases, as to make him think it would have been *luminous*, had the room been dark. He thinks the phenomena is confined to certain diseases, but others have thought it is generally to be met with. These facts may, or may not have a bearing on this subject, but at all events they are worth recording in connection with those already given, and may ultimately be of use.

Subsequent experiments seem to have led the baron to think that this power is to be found in all bodies, which is the view I have already taken.

He further thinks that this will account for those curious likings and aversions, of which we see so many instances, and for which the persons feeling them can give no reason.

“Every one,” said he, “is aware that there is a large number of persons upon whom certain substances have a certain peculiar effect, generally of a disagreeable kind, which sometimes appears to be absurd and ridiculous, and is often attributed to eccentricity; thus there are some who cannot bear to touch fur, others who do not like to see feathers; nay, some who cannot bear the look of butter. The invariable nature of this feeling, and the similarity of circumstances attending its existence among the most different races, and in the most distant countries, led Reichenbach to examine it closer; and he found that these antipathies occurred, for the most part, among persons apparently healthy, but more or less sensitive, and that they increase in degree according as persons suffer from nervousness, &c.; and that, hence, there was evidently some connexion between these sensations and the effects which he had in so many instances found to attend the action of magnetic crystals, and on similar persons.

“We have already seen that, in certain cases, the action of the crystals was attended by a disagreeable feeling, which sometimes produced painful spasmodic affections of the limbs; and that this property could be communicated to various bodies, though in different degrees; and that it is never totally absent from bodies which form perfect crystals. On this subject we have, however, already said enough; and it only remains to say a few

words on the sensations of apparent difference of temperature, the disagreeable feeling, as it were of disgust, and the apparent mechanical agitation of darting pains through the body, sometimes produced by most dissimilar substances.

“Some of these sensations were felt by healthy persons, but highly sensitive individuals felt them all more or less strongly, according to the nature and extent of their disease.

“On making a number of experiments on the most different substances, he arrived at the conclusion that all amorphous bodies which do not possess the peculiar power resident in crystals, possess, in different degrees, according to the nature of the body, and with a great degree of constancy, the property of giving rise to disagreeable sensations, sometimes accompanied by heat, and sometimes by a feeling of coolness. In the crystal, we had a power depending on the state of aggregation, or form; while in the case before us, the nature of the substance is the determining cause of some dynamical effect of another kind.”

This evidently suggests to us that there may be means of alleviating suffering, or at least of removing those distressing nervous sensations which many persons experience, that we as yet know nothing of. We see by these experiments how the sensations are affected by conditions and circumstances before unthought of, but which may be the very means we want, when rightly used, to mitigate human misery. The composition and form of the objects around a nervous patient, as well as sights, sounds and odours, may have a great influence on his feelings, for good or for evil, according to their

magnetic relation. We may also account thus for many of those singular differences in the effects of the same medicines, or the same food, upon different subjects, and for which we are often at a loss to give any reason whatever.

We shall probably discover, eventually, means of operating on human beings through the medium of the nerves, or *neuropathically*, so as to produce any given effect we choose, and thus avoid, except in a few instances, the administration of medicines, or drugs, in any form whatever.

The baron gives many other curious experiments, and others have been made also by myself, but the results are apparently so unconnected that nothing like a system can be built out of them. I have therefore thought it best to record only those which seem more immediately connected with the subject under consideration, leaving every one to draw his own conclusions from them.

There is however another class of neuropathic phenomena which appear different from those already given; at least they are produced in a different manner. I allude to what are called *mesmeric* phenomena, or those of *animal magnetism*!

The belief that some persons could exercise an influence over the minds and bodies of others, merely by an effort of the will, has always been entertained, and gave rise in former times to the charge of magic, or witchcraft. There is, no doubt, a foundation, to a certain extent, in fact, for this belief. It probably arose from people observing certain extraordinary phenomena to which they could give no natural explanation. It is unquestionable now, that some persons can so affect others

by the mere effort of will, as to paralyze their nervous systems and produce unconsciousness. This is frequently taken advantage of in the performance of surgical operations, the patient being *put to sleep*, as the term is, and a severe operation performed without pain, and without the individual being aware of it, till waked up again. In many nervous diseases the mere putting to sleep is of great service, and will sometimes cure. This mysterious effect is, at times, produced almost instantaneously, and without any actual contact of the operator and patient; at other times it requires certain manipulations, and repeated attempts. Such facts as these are too often seen now to be disputed, and, as human nature has always been the same, there is no doubt but that they were known at a very early period. In this enlightened age, though we cannot yet explain them, they are nevertheless believed to be simple natural effects; but in the infancy of knowledge they were always ascribed to the agency of the devil, or some other supernatural being. Hence arose the idea of witches and magicians.

It is not our intention here to discuss the question of *how far* mesmerism, as now taught, is true; the facts we have already mentioned are sufficient to show that one nervous system can operate upon another, and even paralyze it. This we have often seen done, and so have numerous other persons. Neither do we pretend to explain *how* this is done, though the facts we have given concerning the nervous system and its relations, will suggest a theory at once, to many minds. It is our duty at present to gather new truths, and when a sufficiency has been observed their explanation will soon follow.

Suffice it to say that mesmerism is fundamentally true, and that it has rendered valuable aid to the surgeon. I believe myself that it will also render, eventually, equal aid to the physician.

It is highly probable that mesmeric agency was employed in the cure of disease in very ancient times. The Chaldee, Egyptian, Persian, Chinese, Greek and Roman priests, were most likely proficient in its use. Indeed it is scarcely possible to read the account of many of their practices, both religious and medical, without being convinced of it. It is stated, by modern travellers, that some of the figures upon the pyramids are represented as being engaged in the process; and several passages in ancient Greek and Latin authors refer to it unequivocally. Mr. Colquhoun, in his "*Isis Revelata*," quotes the following passage, which is referred to Solon, the celebrated lawgiver.

"And having *touched, with his hands*, him a mass of bad and painful diseases, he quickly restores him to health."

At subsequent periods we have other similar statements of the cure of disease by the laying on of hands, but none possess particular interest till we come to comparatively modern times. In the year 1462 a professor of philosophy at Padua, named Pomponatius, taught that one individual could influence another by the will alone, and he even taught how it might be done. The celebrated Van Helmont, who was born in 1577, made so many cures by mesmerism, that he was said to be in league with the devil. About fifty years later, a man named Greatrakes, of Waterford, in Ireland, performed still greater wonders of the kind. He

was a justice of the peace, and clerk of the county, and appears to have been, by the evidence of the lord bishop of Derry, and other eminent persons, an estimable and honest man. Many years after Greatrakes, a catholic priest named Gassner, created great excitement on the continent of Europe, by performing an immense number of cures, before the archbishop of Ratisbon and others. He also was supposed to be assisted by the devil. Mesmer himself was born about the year 1734. He was somewhat celebrated as a physician, and settled at Vienna. At that time great attention was being directed to the common magnet, and it was while conducting some experiments with it that Mesmer was led to try the effects of the human hand, in the cure of diseases. His success was very great, and soon raised him a host of enemies in his own profession. In 1778 he went to Paris, and there began to promulgate his views. They attracted so much attention, and were espoused by so many eminent men, that the faculty of physicians became alarmed. They accordingly procured a royal commission to be appointed, *chiefly from their own body*, who were to investigate the claims of these new doctrines to public attention, and to publish a report thereon. Mesmer of course declined attending the meetings of this commission, which he was quite right in doing, seeing that they had previously shown themselves his bitter enemies. One of his pupils however attended, and went through a number of experiments, which succeeded with some patients and failed with others. The members afterwards met at the house of Dr. B. Franklin, who was one of their number, and tried the experiments over

again; the results being generally unfavourable to mesmerism. This mode of proceeding could scarcely be called fair, however, and Franklin himself would not have thought so, had his own experiments in electricity been subjected to a similar test, by his opponents. The committee however were not unanimous in their condemnation, for one of the members, the celebrated Jussieu, the great botanist and naturalist, published a minority report, in which he contended that some power must have been present, and that these experiments prove that one human being *can* influence another mesmerically. This commission was no doubt intended to bring in the condemnation which it did; but so far from injuring mesmerism it rather gave it a new impetus, till it spread over the whole continent. A man named Puysegur, at Strasburg, about the beginning of the nineteenth century, introduced many new modes of manipulation, and is said to have been the first who discovered somnambulism. It is probable however that it was known to the ancients.

Mesmer himself was almost wearied to death with the continual persecution and factitious opposition he met with, and at last retired to Switzerland, where he died in 1815, fully affirming the truth of his doctrines to the last.

About the year 1825 some very successful experiments were performed in the Paris hospitals, which made so much noise that the Academy of Medicine felt bound to notice it again. A second committee was therefore appointed who apparently set about their work of investigation with industry, and with a spirit of fairness. It was composed of the following eminent men, none of whom had in

any way committed themselves in favour of mesmerism,—M. M. Bourdois, Double, Itard, Gueneau, De Hussy, Guersent, Foquier, Leroux, Magendie, Marc, Thillaye, and Husson. Many of these names will be familiar to those conversant with the annals of science. These gentlemen took five years to make their report, during which time they examined an immense number of cases. Part of their report is here copied, in order that they may speak for themselves. In their prefatory observations they thus express the feelings with which they were actuated.

“The committee proceeded to fulfil their duties with the most scrupulous exactness; and, while we do justice to those who assisted us, we must at the same time destroy even the slightest suspicion which might arise with regard to the share which others may be supposed to have had in the investigation of this question. The committee invariably suggested the methods of experimenting, traced the plan of inquiry, directed the course to be pursued, followed its progress, and described and recorded the particulars. No experiment was made without the presence of the committee, even by the members of the Academy. Whatever confidence the spirit of confraternity and mutual esteem may have inspired, we felt that in a question the solution of which is so delicate, we are to trust none but ourselves, and you can rely on our guarantee alone.” * * * * *

“It is with magnetism (mesmerism) as with other operations of nature; a certain combination of conditions is necessary to the production of certain effects. Whether these conditions be external

or physical, or whether they be internal or moral, it is sufficient that they exist to make it incumbent upon your committee to endeavour to unite them, and to make it their duty to submit to them. It was, however, neither our duty nor our inclination to have divested ourselves of that indefatigable curiosity which induced us to vary our experiments, and, if possible, to set at fault the practices or promises of the magnetisers. We sought only to be inquisitive, mistrustful, and exact observers."

Surely no one could wish a better spirit than this indicates, and unless we suppose that all these men agreed together to deceive the Academy, which is too preposterous, we must believe them honest.

The following are a few of the facts stated by them.

"A certain number of the effects observed appeared to depend upon magnetism (mesmerism) alone, and were never produced without its operation. These effects were very various; they agitated some, soothed others, produced a momentarily accelerated respiration and circulation, feverish symptoms, convulsive motions resembling electric shocks, numbness, heaviness, sleepiness, and in a small number of cases the state called by magnetisers somnambulism." * * * *

"We may conclude with certainty that the state of real magnetic somnambulism exists when it gives rise to the development of new faculties, which have been designated by the names of clairvoyance, intuition, and prevision; also, when it produces great changes in the physical economy, such as insensibility, sudden and considerable increase

of strength; examples of all of which were witnessed by the committee.

“ We hold it as demonstrated that sleep has been produced by magnetism (mesmerism) under circumstances in which the patients could not see, and were ignorant of, the means employed to occasion it.

“ When a person is once made to fall into magnetic sleep, it is not always necessary to have recourse to contact to magnetise anew. The look of the magnetiser, his volition alone, possesses the same influence.

“ The patient cannot only be acted upon, but be thrown into a complete state of somnambulism, and recovered from it without his knowledge, by an operation performed out of his sight, at a certain distance, and with doors intervening.

“ In general, changes, more or less remarkable, are produced on the perception and other mental faculties of those individuals who are in a state of magnetic somnambulism.

“ Some, amidst the noise of confused conversation, hear only the voice of the operator; some will answer questions addressed to them by persons placed in magnetic connexion with them; others carry on a conversation indifferently with every one around them.

“ Sometimes the power of smelling appears to be annihilated. The patient will inhale muriatic acid or ammonia without inconvenience; nay, without perceiving them. The contrary, however, takes place in certain cases.

“ The greater number of somnambulists we have seen were completely insensible. We might tickle

their feet, their nostrils, or the angle of the eyes, with a feather ; we might pinch their skin so as to leave a mark, prick them with pins underneath the nails without producing pain, and without their even perceiving it. Finally, we saw one who was insensible to the most painful operation in surgery, during which she did not manifest the slightest emotion by her countenance, pulse, or respiration.

“ While in the state of somnambulism, the patients retained the faculties which they possessed when awake. The memory appeared to be more faithful and more extensive ; they remembered every thing that passed at the time and at every previous time in which they were placed in the state of somnambulism.

“ Upon waking they seemed totally unconscious of all that took place during their somnambulism.

“ We have seen two somnambulists, who, with their eyes closed, perceived the objects placed before them. They distinguished the colour and the value of cards without touching them ; they read words traced with the hand, as also some lines of books opened at random. This took place when their eyelids were kept closed by the fingers of a member of the committee.

“ In two somnambulists we found the faculty of foreseeing the acts of organism more or less remote ; one of them predicted, several months before, the day, hour, and minute of epileptic fits ; the other announced the period of his cure. Their previsions were realized with remarkable exactness.

“ We found one somnambulist who declared the symptoms of the diseases of three persons placed in magnetic connexion with her.

“ Considered as a cause of certain physiological phenomena, or as a therapeutic remedy, magnetism (mesmerism) ought to be allowed a place within the circle of medical sciences; and, consequently, physicians only should practise it or superintend its use, as is the case in the northern countries.”

It must not be forgotten that this committee was appointed by the same Academy that had formally condemned mesmerism some fifty years before, and shown it the most unequivocal opposition ever since. We cannot therefore suppose that the members were chosen from those who were expected, or desired, to make a partial report in its favour, but rather the reverse. It is therefore curious and instructive, to note the manner in which their report was received. Great excitement prevailed, and the hall of the Academy was crowded with the members. M. Husson proceeded to read the report, but was frequently interrupted with exclamations of impatience while reading the facts, and at last, in a perfect uproar, they put a stop to him altogether. Such a scene of disorder and confusion has seldom been seen as that exhibited by these philosophers, on hearing new truths, at variance with their own dogmatical assertions. Objections were even made to the report being printed, and it was at last lithographed for the *private use* of the members themselves.

In this way the Academy treated a body of their own members, appointed by themselves, simply because they plainly stated what they had seen. I have alluded to these proceedings more fully because they are so recent, occurring but it remembered in the year 1831, and not a century or more ago.

Since that period mesmerism has made steady progress in nearly every part of the civilized world. In England, among others, Dr. Elliotson, the celebrated physiologist has devoted great attention to it, and met with much persecution in consequence. Dr. E. was much ridiculed, and mesmerism brought into great disrepute for a time, by some of his patients confessing they had been impostors. This has frequently been the case also elsewhere, but is a matter of little consequence to the candid and unprejudiced. If medical science was to be judged of in a similar manner, by the impositions of doctors and their patients, it probably would not meet with a more favourable verdict.

In this country we have numbers of professors of the art, some of them with undoubted powers, and others exceedingly dishonest. Unfortunately it is not always easy to distinguish the one class from the other, without a stricter investigation than most persons have the time, or disposition, to bestow.

The great difficulty with regard to mesmeric facts, as they are called, is, that they are so mixed up with fabrications and misconceptions, that it is impossible to separate the truth from error, except in a few instances. The manner in which these phenomena are produced also, is so utterly unknown, that we can never make sure of producing the same effect again. The operation is conducted on no fixed principles, and it is therefore a matter of chance altogether, as to what effect will follow, in different cases, from a certain mode of proceeding. This however has been the case in the infancy of every science, even the most exact, and is

a defect that perseverance and observation alone will remedy.

Even in its present imperfect state however, mesmerism is often of great service. The removal of tumours, amputation of limbs, extraction of teeth, and other surgical operations, are effected almost every day, without the patient experiencing the slightest pain, or even being aware till some time after, that the much dreaded operation was performed. One of the facts referred to by the French committee is of this kind. A Madame Plantin was troubled with a large tumour in the breast, and was asked, while in the mesmeric state, whether she would agree to its being cut out, which she did. Her dread of the operation however was so great while in the natural state that she could not be brought to consent to it then. She was finally put to sleep, and the tumour was removed by the celebrated surgeon Cloguet. During the whole proceeding she exhibited not the slightest sensibility, nor complained of the least pain, but, on the contrary, conversed calmly with those around her. No alteration at all was observed, either in her pulse, her voice, or her features; forty-eight hours after she was waked up, and had not the slightest consciousness of what had been done. Whether the disease was too far advanced, or the treatment after was improper does not appear, but unfortunately she died from the effects of the operation fourteen days after.

This case, however, fully proved the value of mesmerism in such cases, and led to its being used much more extensively. Very recently we had a successful case of the removal of a tumour, while

in the mesmeric sleep, in New York; the patient knowing nothing of it till afterwards. A man also had his leg amputated, a short time ago, under similar circumstances, and with the same success. In fact nearly every medical journal, or public paper, contains similar accounts.

These are facts which cannot be disputed, and they alone prove the truth and utility of mesmerism, to a great extent. It is undoubtedly a most valuable neuropathic agent, and will eventually be employed much more extensively than it is. If scientific men would direct more attention to it, and in a proper spirit, we should soon have it redeemed from its present character of uncertainty and imposture. There is too much truth in it for any efforts to crush it, and too much trickery in its present practice to prevent its being received without distrust. We should be careful, while we properly refuse our assent to any doctrines not fully proved, that we do not be too skeptical. There may be many phenomena yet to be discovered totally different from any yet seen, and possibly even at seeming variance with what we consider fundamental laws. Philosophers have of late years been so much engaged with mere matter, and its obvious properties, that they have almost lost sight of those mysterious powers which undoubtedly exist, but which cannot be exhibited in a similar manner. Many circumstances make it extremely probable that we are tending towards some great discovery, relating to these mysterious powers, and the time may not be far distant when many things, now considered supernatural by the ignorant, and fanciful by the

learned, will be shown to be simple natural phenomena, like those we ordinarily see.

The foregoing short sketch of mesmerism has been given merely to state the evidence adduced in its behalf, and to show the attention it has met with both in recent and in former times. It is undoubtedly of service, in many cases, both surgical and medical, and is deserving of a more candid trial than it has generally met with.

CHAPTER VI.

DIRECT APPLICATION OF NEUROPATHIC AGENTS,
ARTIFICIALLY ENGENDERED.

Magnetism, its history and general phenomena.—It exists in all bodies whatever.—Its physiological effects.—Its curative power.—The Magnetic Meridian.—Electricity, its history and general phenomena.—Its physiological effects, both natural and artificial.—Its curative power, and mode of applying it.—Probability of our seeing the interior of the body by its means.—Effects of clothing and other external agents, upon our natural electrical condition.—Galvanism, its history and general effects.—Its physiological action.—Its power as a curative agent.—Circumstances to be borne in mind when applying it.—Placing of the poles.—The proper strength of the current.—Illustrations of its use in—Dyspepsia—Constipation—Diseases of the Lungs—Consumption—Asthma, &c.—Rheumatism—Neuralgia—Paralysis—Irregular nervous actions—Tumours—Spine diseases—Nervous affections—Female diseases—Sterility.—Its extensive use in Europe—Works on the subject.—Reports of cases from Medical Journals.—Concluding remarks.—Relative value and proper application of the different therapeutic agents.—Duties of a physician to his patient, both in disease, and in a state of health.

MAGNETISM.

THE phenomena of magnetism were known, and made use of, long before galvanism, or any but the most simple electrical facts were discovered. The attractive powers of the common magnet were observed at a very remote period, and the polarity of the needle has assisted the mariner to discover his way for many centuries.

The first substance in which magnetic properties were observed was the common loadstone—an ore

of iron—which is met with in many parts of the world in great masses. This is called the *native*, or *natural* magnet, while a piece of iron or steel when rendered magnetic is called an *artificial* magnet.

A piece of iron or steel may be made magnetic, either by contact with a loadstone or another artificial magnet, or by being struck, or even held, for a time, in a vertical position. The direct application of galvanism, and electricity, or an electrical state of the atmosphere; light, heat, and motion, and some say even the nervous current, will also communicate the power.

Sometimes the power when acquired is permanent and sometimes not. Thus if the galvanic current be sent through a coil of wire surrounding a steel bar, it will make it strongly magnetic, and so it will a bar of soft iron, but when the current is stopped the steel bar retains its new power, while the soft iron loses it. This is called *electro-magnetism*, or *induced magnetism*, it differs however in nothing from that produced by other means. The smallest galvanic battery will induce a current of magnetism in a piece of soft iron, giving it sufficient attractive power to sustain the weight of a man, but only while the connection is maintained with the battery; immediately that connection is broken the magnetism is gone, but may be restored again in an instant. It is on this principle that the common electro-magnetic, or galvanic batteries, are made. In using these instruments it is not galvanism that is felt, but *magnetism*, which is produced by the galvanism; they are therefore, properly speaking, *magnetic batteries*, and their effects should be in-

cluded under the present head of magnetism. The name "galvanic battery" is so generally applied to them however, that it is requisite to retain it, and to explain their action under the head of galvanism.

It was originally thought that iron, or steel were the only substances capable of exhibiting magnetic power, but we now know that many other substances can do so. Indeed the experiments we have already given show that all bodies possess it more or less, but we have others still more conclusive. Thus minute needles, of almost any substance, when suspended by exceedingly fine threads of silk, will be attracted by a magnet. Brass may be made to exhibit considerable attractive power, and nickel still more so. A plate of copper, when made to rotate quickly, will deflect the needle, or if a magnet be made to revolve above a suspended plate of copper it will immediately revolve also.

The magnetic power of crystals, and of the human body, have already been referred to. Several of the precious stones, as the ruby, emerald, and garnet also exhibit traces of it. Some substance, when added to others, destroy their magnetic powers; a small portion of arsenic added to a mass of nickel will render it non-magnetic, and the smallest quantity of antimony, when added to iron, will have the same effect on that metal.

The physiological effects of the common magnet are not very striking, and have therefore been but little observed till recently. The ancients used to carry it about them as a charm, or talisman, but it does not appear that they used it in any other way. Indeed there are not many persons, even now, who are acquainted with its physiological effects, so that

the statements we shall make respecting it will appear both novel and surprising.

That an ordinary magnet will affect the body is undoubted. The experiments of Reichenbach, given in the last chapter, prove this. It has, however, been shown still more conclusively. Many nervous people, and some even quite healthy, can distinguish a magnet immediately, by merely touching it. Some experience a twitching of the muscles over which one is drawn, while others feel hot, or cold. In some instances it affects the feelings, producing either a state of calmness or considerable excitement. So very sensitive are some persons to magnetic influence that almost any pointed body, but more especially metallic ones, affect them immediately. One lady whom I knew could never use a steel knitting needle without experiencing trembling in the hands, and a fluttering feeling round the heart; others I have known to be affected even by using a sewing needle. I also met with a gentleman who could never use a steel pen without having the most disagreeable sense of uneasiness, though he had not the slightest difficulty with a quill. Very often I have known workmen affected by the tools and other pointed articles which they handled. And I have no doubt but that many persons constantly suffer from uncomfortable feelings, both mentally and bodily, which are either produced or aggravated by apparently simple causes like these. When the system is on the balance, as it were, between healthy and diseased action, the smallest circumstance affecting the nerves may turn the scale either one way or the other.

The application of the magnet as a curative agent

is not receiving much attention now. I have used it however, in various ways, in many incipient nervous affections with decided benefit. I have already stated how the head may be affected by a steel point held between the eyes, and how diseased parts are often indicated by the same instrument. It will also cure the nervous headache sometimes, and even restore sensation in a paralyzed limb.

A few years ago a physician in London, named Perkins, performed numerous cures with what he called *tractors*, which were nothing more than metallic points. These were drawn backwards and forwards over the diseased parts, and were undoubtedly efficacious in numerous cases. Indeed so much noise was made by the success of this novel treatment, that a committee was formed to report upon it, and they stated, after a careful examination, that up to the time when the report was made, the number of cures was no less than *one million five hundred thousand*, including nearly every kind of disease! Public testimony was also borne to their efficacy by numerous persons, including *eight professors in universities, forty physicians and surgeons, twenty-eight ministers, and twelve doctors of divinity*, besides hosts of other well known scientific and respectable persons. Surely, if we can rely upon human testimony at all, this is sufficient to satisfy any one.

A small number of physicians and others, who could not imagine any thing to be true that was different from what they had been taught, wished to make it appear that the process was a mere deception. They accordingly took a number of patients and treated them with nothing but bits of wood.

painted to look like the real metallic tractors, and triumphantly announced to the world that as many cures were effected as with the real ones; they therefore derided the whole process, and endeavoured to dissuade people from resorting to it. Now this was certainly very short sighted, or narrow minded; it was not denied that the metallic tractors did cure, but merely shown that tractors made of other material would also cure,—therefore, said these wise-aces, the whole thing is a deception! A lame conclusion truly. It was rather a convincing proof of its reality, and should have led to its further investigation. The experiments we have given prove that magnetism exists in *all bodies*, so that the wooden tractors of these philosophers, actually possessed the same power, only in a different degree, as the real metallic ones, and therefore produced similar results. The only inquiry should have been, “*are the patients cured by both processes?*” If so both are *real*, no matter how they may apparently differ from each other. If any means whatever will remove disease, we ought to employ them, though they are ever so different from those we have previously employed, and notwithstanding we cannot explain them.

I have frequently employed these tractors, both to detect disease, as already stated, and also as curative agents, with considerable success.

The effects of the magnet, however, are not so obvious generally, as those of electricity or galvanism, though they may often be as beneficial. No precise rules can be given as to the mode of using the magnet; sometimes holding it in the hand will produce the desired effect, and sometimes it may be

drawn over the affected part, backwards and forwards, or merely held over it for a time. The form also may be varied so as to produce very different results. A sharp pointed bar is the most powerful for exciting healthy local action, the point being held, or passed over the affected part. The common horseshoe form is best to hold in the hand, or lay upon the body. A large electro-magnet, capable of supporting the weight of a man, will frequently produce a strong stimulating effect on the whole nervous system, if the person merely stand under it, and the effect will remain for a long time. I recollect a young man subject to fits being cured by this alone. The magneto-electric machine, or revolving magnet, gives shocks like the galvanic, or electro-magnetic machine, and has similar physiological effects; but it is sometimes serviceable in cases where they are inactive. In all cases the position of the patient, and of the instrument, with respect to the magnetic meridian, is of the utmost consequence, the most opposite effect being sometimes produced by a change. A knowledge of this fact is of great importance, both in medical practice, and also in giving advice to those who handle magnetic bodies. It should be borne in mind that the magnetic meridian is not exactly north and south, but crosses the true meridian at an angle of about twenty-three degrees and a half, to the north-west and south-east.

ELECTRICITY.

The ancients were acquainted with a few facts relating to this wonderful subject, but knew not how

to associate them together, or to seek for new ones. It was not till the latter end of the seventeenth century that any thing like a *science* of electricity arose, and began to be studied. But immediately that it received the attention of industrious philosophers, its wonders were disclosed in rapid succession. The discovery that an unlimited supply of electric fluid could be obtained by mere friction, was soon followed by that of the Leyden jar, by means of which it could be condensed and stored up; and that again was succeeded by the splendid experiment of Franklin, which demonstrated the identity of this fluid with the lightning of heaven, and taught us how to use either the one or the other. Since then rapid advances have been made in our knowledge of this subject, and every day adds new wonders to the large stock already accumulated.

The facility with which electrical experiments are made, and their obvious association with striking natural phenomena, have made the science popularly known, and there are but few persons of intelligence now, who are not acquainted with it more or less. This knowledge however is chiefly confined to its chemical and mechanical action, while its physiological effects are comparatively unknown: nevertheless there is no agent that affects the body more, both naturally and artificially. For instance, sometimes the body feels weak, the mind languid, and the temper irritable, while at others all is activity vigour and amiability, simply owing to some atmospheric changes, which cause a difference in our electric conditions and relations. Every variation in temperature, chemical combination, and mois-

ture, excites electric disturbance, and has an influence on our mental and bodily functions; so also does our clothing, the situation in which we live, our employment, and the objects around us. In short the most trivial circumstance concerning our physical relations is important in this respect. The electric fluid perpetually acts and reacts, in and upon, every particle of matter, and every one of its combinations, organic or inorganic, and the smallest change in any body produces a corresponding one in the bodies around, there being a constant tendency to an equilibrium. This would seem to indicate to us that, when artificially produced, electricity must exert a similar influence, and we accordingly find that it does so. By its means we can produce many decided effects on the human system which will not follow the employment of any other means. The electric shock, or the lightning stroke in miniature, has been a subject of curiosity and awe ever since its discovery. The old electricians, who first experienced it, gave such exaggerated accounts of its effects upon them that no one, for a long time after, chose to run the same risk. The timidity was further increased by some discoveries, and by untoward accidents. When Franklin proved that the fluid from the common machine was identical with the lightning of heaven, every one shrunk from allowing it to pass through their bodies, and their fears were further increased by the death of a philosopher, who had drawn down the lightning to use, and was killed by it. By degrees, however, this fear wore off, and Europe was filled with travelling electricians, who administered "*the shock*" for a small compensation, either to gratify curiosity or to cure disease. Being

given promiscuously however, and upon no principle, it was frequently inoperative, though often doing much good. Medical men were slow in trying the new remedy, as they generally are with any thing that does not originate with their own body, and it was consequently left in the hands of other persons. Until lately but few professional treatises on the subject were issued, but now we have several, and its employment is quite common.

Like magnetism, electricity may be given in many different ways, each suitable to different cases. The shock has decidedly the most powerful action, and must therefore be used with caution. We can make it strong enough to tear the most solid bodies, set fire to inflammable substances, effect chemical decomposition, and even kill a person; but we can also reduce it so low that a child will not complain of it.

A succession of smart shocks is well adapted to rouse the nervous system in many cases of melancholy, and hysteria, and in many local affections, to restore suppressed action. In suspended animation also, from drowning or poisons of various kinds they will often call back the vital spark. A single shock will often restore the use of a paralyzed limb, remove deafness, destroy neuralgic or rheumatic pains, and disperse morbid accumulations.

It is absolutely necessary, however, that the operator should fully understand the principles of electrical science, or the result may be far from satisfactory. For instance, the shock may be given in two different ways, the charge either passing into the patient, or out of him. That is, he may either

have the electricity drawn from him, or passed into him, according as he is made relatively positive or negative. In the same manner that the stroke of lightning sometimes proceeds from the cloud to the earth, and at other times from the earth to the cloud, the force of the stroke being equal in both cases. The strength of the shock may also be the same in both modes of administering it, but the effects are often very different, though many operators are not aware of the fact, when one mode is to be used and when the other experience alone will teach.

Sometimes we merely put a person upon an insulated stool, and either increase or diminish the amount of electricity in his system for a time. Sometimes we abstract or add it from small metallic points, a mode which produces very singular sensations and frequently has great effect; particularly in many diseases of the eye and the ear, and in those of the heart and spine, and in nervous twitchings. At other times we give, or take away sparks, varying the size according to circumstances.

When passed through water, the electric discharge will decompose and resolve it into its component parts, oxygen and hydrogen gas. It will also have the same effect on many other chemical compounds, and no doubt often decomposes substances while passing through the body. Another curious power which it possesses is that of making many bodies appear luminous and transparent that are not so ordinarily. Thus if a number of eggs be placed in a row, with the ends touching each other, and a charge be sent through them, they will appear so luminous and transparent, during its passage, that all the interior can be perfectly seen. In

like manner the internal organs of several insects can be seen in operation, by the same means, and it has even been proposed, long ago, to inspect the interior of the human body in the same way. Very lately I see that some foreign philosopher has been attempting this, and appears to think that we may ultimately succeed. Some years ago I tried many experiments to determine this myself, but not having a perfect apparatus I could not do so satisfactorily; I am now, however, pursuing the subject again, and am forcibly impressed with the conviction that we shall ultimately be able to see the interior of the body, by making it transparent, as well as we now do the exterior, and thus study its operations, and detect where disease lies with certainty.

In many cases where artificial electricity is not required or advisable, we can still influence a patient by it advantageously in a natural manner. In clothing, particularly, this can be done. Some articles retain electricity, and others conduct it away. Some engender it, by rubbing upon the skin, in great quantities, while others have little or no effect of the kind. This can be forcibly shown by first rubbing briskly with the dry hand, a silk stocking or glove, when the body is dry and warm, and then suddenly tearing it off. The article itself will often distend, owing to the two sides being repelled from each other, as if it were blown on with air, and will be strongly attracted towards any conducting substance. The body itself feels warm, and as if cobwebs were being drawn over it, and in the dark will frequently emit sparks. The same effects will not follow when cotton or any other substance is worn, which proves how different is their action

upon the skin, and consequently what different effects they must have in many diseases. Great benefit is frequently derived from wearing silk upon the body in many affections of the lungs and spine, and in rheumatism. A piece of brown paper covered with thin silk on both sides, and worn over the chest, will make it feel warmer than flannel or any other substance, no matter how thick they may be, and will give more comfort. Good brisk friction on the skin with a silk or horse-hair glove, will create intense action, and is by far the best stimulus that can be applied. I know of no better exercise than this, either to produce warmth or exhilarate both mind and body; and many a shivering hypochondriac would find himself far more effectually relieved by it than by all the medication ever practised. Silk is a perfect non conductor, and therefore retains the electricity upon the surface of the body, where it stimulates the skin, and keeps up the circulation in its minute blood-vessels, and thus causes warmth. Other substances, being conductors, let the electricity escape, and then the vessels not having their proper stimulus, act slower, and thus cold is produced. We can therefore influence the surface of the body to a great extent by attending to the *nature* of its covering, as well as to its quantity. Rubbing the head when one is in a difficulty, is popularly said to excite thought,—to bring out the bright idea—and certainly there appears as much reason for this conclusion as for many others to which we come unhesitatingly. Let any one wash his hair perfectly clean, and then, when dry, attempt to comb it smooth, he will find it stand out in all directions; each hair trying

to get as far as possible from the others; every passage of the comb will make it worse; it will snap and crackle, and give off numerous sparks, like those from the back of a cat when rubbed in the dark, and cannot be made smooth till it becomes wet or oily. Many persons have been plagued in this way without knowing why, and little thinking that electricity had any thing to do with their trouble. Now every motion of the hand while rubbing the head, has, more or less, the same effect, and possibly the electrical disturbance on the outside of the head may excite the brain within. The action may, in fact, be intuitive, and of positive utility.

Electricity is applicable more particularly to those cases when we wish to produce a strong effect suddenly: it may, however, be sometimes used in a gentle manner, and for a long period, with great advantage. Like galvanism and magnetism, it is generally employed in the nervous stage of diseases, but it is also effective in some organic derangements.

Some animals, as the Torpedo or electric eel, possess a natural electrical battery in their bodies, with which they defend themselves, and kill their prey. I saw one of these exhibited some time ago in London, and received a shock from it which was quite as strong as I should like to receive one. It is said that a number of them will sometimes stun a horse when he happens to enter the water where they lie. Some small marine animals will numb the hand when touched, by the same means.

It has been said that human beings have sometimes given spontaneous shocks, and it is certain

that many persons have exhibited a luminous appearance, and emitted sparks.

The effect of the electric shock, both on animals and vegetables, is similar to that of a stroke of lightning. Small animals and tender plants may be killed very easily by transmitting it through them. Eels are usually very difficult to kill, but a smart shock deprives them of life instantly, if sent down their whole length; but if it be sent down a part of the body, only that part will die.

The bodies of animals killed by electricity or lightning, putrefy very rapidly, and so does any kind of flesh when submitted to its action. When death ensues from either of these causes, the blood does not coagulate, but remains fluid. This has been explained by supposing that the blood is really living, and that coagulation being a result of its vitality, is prevented when that vitality is destroyed, as it is by lightning or electricity.

GALVANISM.

The first discovery of Galvanism was made by Galvani, in the year 1790. He noticed that the limbs of frogs became convulsed when they came in contact with plates of different kinds of metals, even though they had been dead for some time. Soon after him, Volta formed the first battery, consisting of a pile of metallic plates, alternating with wet cloth. More perfect instruments were soon formed; a greater power was gained, and new wonders began to unfold themselves. Chemical decomposition and recomposition was effected by the new power with great readiness; and at last Sir H. Davy astonished the whole world with his brilliant

discovery of the bases of the earths and alkalies. He made it apparent that potash, soda, magnesia, and several other similar bodies, were not simple elements, as had been previously supposed, but the oxides, or rust, of certain metals, and by means of galvanism, he obtained these metals in their pure state, and exhibited them the same as lead or iron. Since then, discoveries equally interesting and important, have literally crowded themselves on our notice, till at the present time the galvanic battery is one of the most powerful agents the chemist possesses, and the great fountain of hope from whence the philosopher finds support and encouragement for his most daring speculations. The magnetic telegraph, and the electrotype process, are some of its most recent services, and they are well calculated to make us truly sanguine as to the future.

As regards physiology, galvanism has been equally productive of useful and wonderful results. The nature and mode of operation of the nervous power has been discovered by its means. Many of the vital functions have been effected by it alone; and the dead body has temporarily resumed its power of action. Living animals have arisen under its influence from mere inorganic matter, and vegetables have also apparently been produced in the same way.

Almost from the time of its discovery, galvanism has been used as a medical agent, and frequently with great success: but, like magnetism and electricity, the principles on which it acted were not known; its results, therefore, were often uncertain, and not so beneficial as they otherwise might have been. When properly used, and especially in the

nervous stage of disease, I believe it to be the most effective, as it is the most natural curative agent we possess.

At the present time it is receiving great attention from many eminent men, who present us with the results of their labours either in reports to scientific bodies, or in regular treatises: and in almost every medical periodical that is issued, cases are reported of its successful application, some of which we shall allude to. It is not possible yet, even if our limits would allow, to show the full extent to which it may be used; we shall, however, point out a few of the chief diseases and derangements to which it may be applied, by way of illustrating its mode of action, and as a guide in other cases.

To understand the mode in which galvanism operates, it is requisite to bear in mind the explanations previously given respecting its production, its universality, its effects on the body both dead and alive, and its identity with the nervous power. It must further be observed, that one side of the battery, while in action, has a superfluity of galvanic power, and the other a deficiency; and that when the two sides are connected, it flows from one to the other through the connecting body: the side that is deficient is called the negative, and the other the positive pole. If a person put one hand to one side of the battery, and the other to the other, the fluid will pass through his body; and to do so, it must pass *in* at one side, and *out* at the other. This is important to notice, as it is sometimes of consequence which way the current runs, and at what point it enters or leaves the body.

The placing of the poles upon the body so as to

determine the parts through which the fluid shall run, is also a matter of great importance. It must be recollected that it takes as straight a course as possible; going, in fact, in a direct line from the positive to the negative pole, and passing through all the parts of the body lying between. It is essential, however, to its proper action, that it should pass *through the nerves* of the affected parts from their origin to their termination; and the poles must be so placed as to insure this, for reasons that will be obvious on reference to our explanation of the nervous system and its uses. One pole must therefore be placed on the spine, at that spot where the nerves originate, going to the diseased part, and the other over the diseased part itself. This will insure the passage of the galvanic fluid through the nerves, and in whichever direction we please, either in the same direction as the nervous current, or the reverse, according to the position of the poles.

Sometimes it is best to make the galvanic and nervous currents run the same way, and at others to make them meet each other; but no certain rules can be given as to which way should be chosen in any particular case; though generally the stimulus is greater when the two currents oppose each other. It is a good plan sometimes to reverse the poles suddenly and frequently, so as to make the current pass each way for successive short periods.

When we wish to rouse the whole system, in cases of general debility and languor, it is best to pass it down the whole length of the spine, so as to stimulate all the organic nerves at their roots. It is also a good plan to place one pole on the spine; removing it to different parts occasionally, and

move the other over the whole surface of the body. In nervous headache, the two poles should be put together at the top of the head, and then separated; one being drawn down the spine, and the other down each side of the face alternately to the chest. But in sick headache, where the stomach is at fault, the treatment should be directed to that organ.

The instrument most generally employed in these applications, is that called the "galvanic battery" or "electro-magnetic machine." This is, properly speaking, a magnetic, and not a galvanic instrument, as I have previously shown. It is, however, governed by the same laws as the common galvanic battery, and its physiological action is similar, but more powerful; so that a small instrument of this kind is as efficient as a large cumbrous battery, and much more convenient. In some cases the primary, or true galvanic current, has a different action from the secondary or magnetic current, because it exhibits a great chemical action, of which the secondary current is deficient; though they have a similar physiological action. This evidently indicates their different uses. In cases where we merely want to act on the nerves or other organs to influence their physiological action, we use either current, though the secondary or magnetic is most convenient and powerful; while the galvanism itself may be used when we have decomposition, or chemical action, as in ulcers, cancers, &c., and in various morbid accumulations.

In all the cases hereafter given as treated by *galvanism*, the instrument understood to have been employed is the ordinary electro-magnetic machine, and the effects are therefore really due to magnet-

ism, though referred to galvanism, from deference to the popular idea. When the true primary galvanic current has been used, it will be specially stated.

These explanations are given because the public, generally, is unaware of any differences, either in the apparatus or the agent employed. In fact, I have met with many *operators* who knew nothing at all about it, and who used any kind of instruments they could procure, calling them all galvanic. It is requisite, however, that a correct knowledge of all these mysterious powers, and their specific chemical and physiological action should be acquired before success can follow their employment. It is simply from want of this knowledge that many persons fail in doing good with them, and sometimes even cause injury.

The strength of the current must depend on the stage and duration of the disease, and upon the peculiar constitution of the patient; some being but little affected by what would prostrate others. It is also requisite to give it much lighter to some organs than to others—thus the heart, the head, and the eye, require but a slight power. In all cases it must be given very gently the first time, and gradually increased; the sensation being so strange to those who never experienced it before, that it may possibly cause alarm till they are accustomed to it.

The most common mode of making the application is, to apply the termination of the wires, or metallic poles, immediately to the skin. This, however, often causes severe pricking and burning, it is therefore better to substitute a piece of wet sponge, or cotton, which transmits the current with-

out any such inconvenience. Sometimes it is necessary, however, to use a sharp point, or a row of points, like a steel comb, particularly in spinal affections. The best means of applying it to rouse the whole system, in cases of general debility, and hypochondriasis, is, to place the patient in a warm bath, and then send the current through the whole body. This is also a good plan in some local affections, and in many female complaints.

Dyspepsia, especially when it arises from nervous exhaustion, is more generally relieved by galvanism than by any other means. It is well known that medicines seldom or ever do any good in this disease, and it is evident why they cannot. There is simply an insufficiency of nervous power, owing to the person exhausting it all in thinking, or some other process, and what is wanted is either to *rest*—and so allow the stomach to regain its due share of that natural power—or else to substitute an artificial power. Medicines can neither call back the lost nervous power, nor give a substitute, but galvanism, as we have previously shown, will itself enable the stomach to act, almost as well as it does with the nervous power, it is therefore both an efficient and a proper substitute. I have often known confirmed dyspeptics, who had lost all appetite and taste, feel hungry, and their mouths water, even at the first application. I feel confident that nearly every case of dyspepsia, unless there be structural disease of the stomach, which is seldom the case, may be cured by the galvanic battery without a particle of medicine of any kind. I remember one case of an old gentleman who had been tormented by this disease for nearly forty years, and whose purse had

been a harvest field for half the physicians in the city where he resided, both regular and irregular. When I saw him he was taking dinner pills, bitters, and bran bread, and being shampooed every day, but without the slightest relief. "I feel so weak," said he, "that I think sometimes all my inside is falling out, and when I eat, it seems as if lumps of lead were lying in my stomach, which sometimes burns and then feels cold, or goes sick, and twists and gnaws till I fancy it is full of ravening worms. And then the distressing feelings I have, the horrible sinking of spirits, and doubts and fears about nothing; the sleepless nights, and terrifying dreams,—oh! I suffer more than any one can conceive, and there is no relief." I advised this patient to leave off all his medicines, eat but little food, drink only water, and have the battery applied to his stomach. He did so, and was soon satisfied with the result. On the second day of the application he remarked, "I feel *easy*, there is no sinking, or gnawing,"—and the next day he felt hungry, and ate without being oppressed by his meal. The application was continued for about three weeks, every day at first, and then every other day, at the end of which time he declared he felt so well, had such an excellent appetite, and was so free from all uneasiness, that he did not require any further treatment. I have seen him frequently since, and now find him in good spirits and health, and as capable of enjoying himself at the table, in a moderate way, as any man I know. His case is only a sample of many others, but it forcibly illustrates the uncertainty, if not positive injury, of depending on drugs in such cases.

Constipation of the bowels, or costiveness, is another disease in which medicine is sadly at fault. It is generally caused by a cessation of the peristaltic motion, owing to a want of action in the muscular coat of the intestines. When purgative medicines are given, they stimulate for the time, but leave a greater degree of torpidity afterwards, thus aggravating the evil, as every one knows who has much used them. It is quite common to meet with persons in whom all natural action is lost, and who are compelled to take medicines, or injections, as regularly as they do their food. This, however, is very injurious, and must, sooner or later cause great derangement in the whole system. The application of the battery, in all such cases, is invariably attended with relief, and the reason will be obvious on studying its operation. Immediately the galvanic current begins to flow, from the spine to the surface of the abdomen, the peristaltic motion is excited, and the intestines are in a state of commotion, which lasts for a long time afterwards, and almost invariably leads to a proper performance of their functions. I have known a single application produce an effect equal to a strong cathartic, without any of its injurious after consequences, and I scarcely recollect an instance wherein the final result was not perfectly satisfactory. Galvanism is, undoubtedly, the best and most natural agent we can employ in this troublesome affection. It is nearly always successful, and is as harmless as medicines are injurious.

Sometimes constipation arises from want of action in the mucous coat of the intestines, which does not secrete sufficient mucous to facilitate the passage of

their contents; but this is seldom the case, and even when it is it may be remedied by the same means. Most generally, however, this form of constipation arises from some impropriety in diet, and may be relieved by a change, without resorting to other treatment.

Diseases of the lungs, of almost every kind, even the most hopeless, are capable of being benefited by galvanism, some of them to a much greater extent than by any other means, and all of them more so than by medicines alone.

Asthma, it is well known, is scarcely ever benefited by drugs of any kind. A change of regimen, diet, or climate, is always recommended, and any good which the patient experiences arises more from these than from his medical treatment, for without them he seldom improves at all, while with them he may. Galvanism nearly always affords relief in asthma, particularly if applied early, and when it is spasmodic even more than in other varieties. I have known a patient when nearly suffocated with a fit, and apparently dying, to be relieved in five minutes by passing the current through the chest; and, by continuing its application for some time, it has often cured cases of long standing, even when they appeared quite hopeless. Dr. W. Philips cured every one of twenty-two cases, by this agent alone.

Pleurisy, and nearly all kind of pains in the chest, are usually relieved by it in a short time, and so is difficulty of breathing and tightness.

In pneumonia, or inflammation of the lungs, as in most other cases of acute inflammation, the application should not be made to the affected part,

but to the other organs, to excite them and so relieve the lungs. When the inflammation is chronic, however, the application may often be made with advantage.

Consumption, the usual consequence of pneumonia, it is well known is but little amenable to medical treatment. In spite of all the discoveries recently made, and notwithstanding the attention of our most eminent men has been devoted to it, this fearful disease still rages unchecked, and numbers its victims by tens of thousands as heretofore. But still nature herself often cures it, as we see by persons being found after death with their lungs covered with cicatrizes, or scars, showing that ulcers had existed at one time, but healed up. This evidently indicates that if we can *assist nature*, the cure may be effected still more frequently! The question then comes, how is this to be done? to answer which we must see how nature operates. The ulceration, or decay, is apparently caused by the presence of some morbid matter, which is either imbibed with impure air, left after inflammation, or passed into the lungs instead of being removed by the skin or other organs; and which, when there, acts in the same manner on them as a strong acid does on metal, eating away their substance, and gradually extending its ravages till they are destroyed, or the rest of the system suffers sympathetically. Nature endeavours to carry this morbid matter out of the system, by an increased action of the absorbents, and if she succeeds in carrying it away faster than it is formed, a cure is at last effected, and the ulcer heals. Any means, therefore, which will stimulate the absorbents to increased action, must

forward the process of cure, and are useful. No medicines ever yet given seem to act in this way, except indirectly, when they improve the general health. But galvanism, as we have seen, makes every organ to which it is sent act with increased vigour, and must therefore be serviceable, if applied in a proper manner, so as to excite the absorbents. I have tried it in several cases, and in some with the most complete success; two in particular were very remarkable. One was a lady about thirty-two years of age, the mother of a family, and who had been afflicted for several years. The symptoms were such as to leave no doubt as to the nature of her disease—cough; expectoration, often tinged with blood; severe pain in the chest and between the shoulders; cold night sweats, with general and increasing wasting and debility. She had been under treatment by several eminent physicians, and had taken no small quantity of patent medicines of various kinds. In spite of all, however, she still got worse, and was evidently impressed with the idea, as were her friends, that a fatal termination would soon ensue. My lecture on galvanism in the winter of 1845, led her to think that it possibly might do her good, and though I had scarcely a hope at first that it would, I determined to try. The application was made almost daily for some months, and with the happiest results. The pain ceased, the cough became less troublesome, the matter expectorated was less, and assumed a healthy appearance; the strength returned, and the body became stouter. This improvement steadily continued until there was no doubt but that a beneficial change had occurred. The application is still continued occasion-

ally, and with no signs of a relapse. The other case was that of a young woman about sixteen, in whom all the symptoms were still more strongly marked, and who was also afflicted with incipient spine disease. Her friends already thought of her as an early victim, and only resorted to galvanism from a conviction that no means should be left untried, though they had scarcely a hope that it would be of service. The improvement was decided, however, from the very commencement, and in a short time all the symptoms were so much mitigated that she went on a visit in the country, and I hear has remained quite well to the present time. I have no doubt but that in every case, where recovery is practicable, it may be effected by this treatment. When, however, there is so much morbid matter formed that it cannot be all absorbed, before the disease extends too far, there is no hope, galvanism can do no more good, in such cases, than medicines. The sooner our treatment is commenced therefore the more certainty there is of success, the delay of a few weeks only, may be fatal in cases which might have otherwise been cured.

The expansion and swelling out of the chest, while the current is passing through it, is a very remarkable phenomenon, and forcibly illustrates, in one respect, its mode of action. It is as evident as the motion of the intestines when they are operated upon, and is often felt for a long time after the application is suspended.

Rheumatism may generally be treated successfully with galvanism, either before the acute stage is fully set in, or after it has passed, but during the height of the attack, our attention should be directed

simply to reducing the inflammation. When the disease has become really chronic, galvanism is almost the only agent that will act beneficially upon it, and it seldom fails us. Cases of forty years standing, with swelling, and stiffness of the joints, have been cured by it, in a very short time.

Neuralgia is still more amenable to its influence; indeed in all ordinary cases, unless depending on structural disease, it may be considered a specific. Administered at the commencement of an attack it always cuts short its duration, and continued afterwards it generally prevents its return. This is another disease in which medicine is sadly at fault, indeed quite baffled, and equally so is surgery; the nerve may be divided, but still the pain continues notwithstanding the operation. The reason is this, when a person has neuralgia, say on the face, though the pain is felt at the end of the nerve, yet the seat of it is at its origin, in the spinal marrow, or base of the brain; we do not therefore extirpate, nor insulate, the diseased part, and so afford no relief. It is a well known physiological fact, that irritation at one end of an organ frequently produces an effect at the other end. Thus tickling the upper part of the throat makes the stomach, at the other end of the oesophagus, contract and produce vomiting; the irritation caused by worms in the rectum produces itching in the mucous membrane of the nose, which is a continuation with that of the intestines. Uneasiness, therefore, at one end of a nerve is a probable indication that there is something wrong at the other, and this is most likely the case in neuralgia. Galvanism can be applied from the origin to the termination, and thus, with certainty, reaches the

diseased parts. The beneficial effect, both in rheumatism, neuralgia, and many other diseases, is partly owing to a profuse perspiration, which the galvanic current nearly always produces. There are few things which can be more depended on for this purpose, and I have often known a patient perspire freely in five minutes after its application, when the strongest sweating medicines had been tried without effect.

Paralysis, either of the nerves of motion, or those of sensation, or both, can be cured by galvanism if capable of cure, though it is seldom, if ever, benefited by any other means. The cause of this distressing affliction appears to be seated in the brain or spinal marrow, and if it be in any part that we can reach, relief can be afforded. But it is sometimes situated where we cannot act upon it, as in the base of the brain for instance: and sometimes it results from some injury or decay of the part, in both of which cases we can render no direct assistance. Great, indeed, is the joy of the patient, and the satisfaction of the physician, when a limb that has been paralyzed for years, resumes its functions; and fortunately this satisfactory result is by no means rare. The wonderful agent, whose action we are describing, has often made the crooked limb straight, and enabled the victim of palsy to throw away the crutches on which he had been compelled to rely for support. But in all these cases it is requisite that the muscle be still capable of contraction, for without this, of course, motion is impossible.

The following cases are given by Dr. Golding Bird, in a letter to the editor of the London Lancet:

they are valuable as illustrations, and also as evidences that medical men are beginning to appreciate this valuable agent.

1. *Cases of partial paralysis, resulting from congestion or other cerebral mischief, admitting of successful treatment. The congestion or effusion is removed, but a more or less palsied state of some part of the body remains.*

“Cases of this kind are common enough; and although the paralysis in general slowly disappears with the cause of the cerebral disorder, still the axiom of ‘*sublatâ causâ, tollitur effectus,*’ does not always apply. Every now and then, although the blow has ceased, the bruise (if the expression be permitted) remains. Time, friction, change of air, restoration of the general health, strychnia, &c., will, after all, succeed; but when with improved general health the stimulus of the electro-magnetic current be employed, success is much more general and certain. All that is required here, is to apply one of the conductors, covered with wet linen, over the trunk of the largest nerve of the part affected, and to pass the other, similarly covered with linen, over the region of the palsied muscle, so as to keep them actively contracting for some minutes. In recent cases, a single application will often succeed; in more chronic ones, the remedy may be continued for weeks, until the paralysis disappears. One of the first cases in which I used this remedy, occurred about nine years ago, in a gentleman holding a prominent position at the bar. I saw him with Mr. Freeman, of Spring Gardens, under whose care he was. This gentleman had palsy of the left side of

the face, the relic of an hemiplegic attack following cerebral congestion, the result of intense study and anxiety. His cerebral disease had been cured, his general health restored, but the paralyzed nerves of the face alone refused to resume their functions. The electro-magnetic current was applied daily, the patient's footman being the 'medical electrician,' and in a few weeks he quite recovered.

2. *Paralysis of muscles supplied by the portio dura, following exposure to cold.*

"This form of local paralysis, independent of cerebral mischief, generally yields readily to treatment. Cases, however, occur, in which the nerve remains inactive, and the patient walks about for a long time with a distorted face. The electro-magnetic current is here of great value. I have seen many cases of this kind: one to which I was recently called resulted from exposure of the left cheek of a lady for some hours to a current of air from a broken window. She recovered readily from the accompanying bronchitis, but was left with her features distorted, being drawn to the right side. I at once suggested the current from the apparatus; her maid-servant was the operator, and cured her mistress in a week.

3. *Local paralysis involving the whole or part of a limb from exposure to cold.*

"This variety resembles the last, and is probably of a rheumatic character; although, it must be confessed, it is often a difficult task to define the line separating rheumatic from some paralytic affections. The following is one of many I have seen:—The

actuary of one of the large assurance offices consulted me, with nearly complete paralysis of motion of the left arm, sensation being pretty perfect; no pain whatever in moving the limb. During a cold winter, he had been in the habit of sitting at his desk, with the right side of his body roasting by a large fire, whilst the left was chilled by blasts of cold air from a frequently opened door. Gradually, pain and stiffness appeared in the left arm, but no swelling. The pain gradually vanished, and the limb was left palsied. Other remedies proving useless, the electro-magnetic current was applied. I ordered a conductor to be placed over the lower cervical spinal region, to influence the origin of the axillary plexus, the other being passed down the arm. After a few weeks he quite recovered. This gentleman was his own operator: he fastened the spinal conductor in its place by his neckcloth, and thus had the right hand at liberty to apply the other.

4. *Paralysis affecting one side of the body, or a single limb, the result of exhaustion.*

“These cases are not unfrequent, and before their nature was understood, they used to be fearfully mismanaged, the paralysis being looked to, rather than the cause producing it, and depletion and mercury employed, when nutritious food and stimulants were really indicated. It often happens that these cases are directly traceable to an obvious cause, and then the diagnosis becomes easy. The insidious exhaustion and enervation produced by excessive lactation is a not unfrequent cause. I saw a well marked case of this kind, five or six years ago, in a patient under the care of a most excellent and

talented practitioner, Mr. Pretty, now residing in Mornington road. This lady, a person of weak frame and strumous diathesis, had become exhausted by nursing her third infant, and the left arm became gradually palsied as far as motion was concerned. A generous diet, weaning the child, and the electro-magnetic current, were ordered. I had lost sight of this lady until a few days ago, when I was called to see her sinking from phthisis. I then learnt that, under the treatment suggested, the paralysis had soon disappeared.

“Paralysis, from enervation, has occasionally followed sudden loss of blood at flooding labours. I have witnessed complete hemiplegia as the result. A case of this kind I once saw with my friend, Mr. Law, of Finsbury, who had most properly treated the poor lady with generous diet and iron, under which she did well. When under this treatment, in spite of the restoration of the general health, paralysis remains, the electro-magnetic stimulus promises, from what I have seen, to be of much service.

5. *Cases of rheumatic paraplegia.*

“To this category I refer cases of rheumatism, affecting chiefly the lower extremities, the pain and acute action disappearing, while more or less complete paraplegia remains. In these cases, I have seen the greatest benefit result from electro-magnetism, as well as from ordinary electricity. I have witnessed so many of these cases thus treated do well, that I can speak with great confidence of its influence. One case will suffice as an example. A man came last summer into Luke’s ward, at Guy’s,

under my care, with complete paralysis of motion of the lower extremities. He was totally unable to move his feet or knees, and was carried into the ward. This state of things had followed the dashing of ice-cold water on his legs and thighs, whilst sweating profusely. But little medicine was ordered for the man, and in less than three weeks, he, under the use of electro-magnetism, walked about the ward, aided by one crutch and his stick. In these cases, one conductor should be firmly pressed against the sacrum, whilst the other is placed in a basin of salt and water, in which the feet are immersed.

6. *Paraplegia the result of enervation.*

“I am not quite sure of the pathological correctness of the title I have thus assumed. By it, however, I understand a series of cases in which paraplegia, both of motion and sensation, results from excessive fatigue, from sitting for weeks and months together, during the greater part of the twenty-four hours, with the spine somewhat bent. I knew of one case in which a distinguished physician actually became thus palsied, after assiduously devoting his time to the study of certain phenomena by the microscope, in doing which, he, for hours together, used to lean over the instrument. There is, however, another cause, unhappily too rife, of these cases, the miserable result of the utilitarian dogma which makes human labour a marketable commodity, without any regard to the conservation of health. I may perhaps startle some by announcing the fact, that I have, in several instances, seen more or less complete paraplegia among a class of labourers of

the most oppressed and most unprotected character. I refer to the needle women of this metropolis—a class of girls and women who, to earn enough of the wretched pittance they receive from the agents who employ them, to procure the commonest necessaries of life, are often compelled to work for fourteen, sixteen, eighteen hours, or even sometimes longer, in the twenty-four hours. They toil on, indeed, at the needle, until the sight fails as they drop asleep; waking, after snatching a short slumber, to resume their work. These poor creatures receive from three half-pence to four-pence half-penny for making a shirt, (for the latter price producing such as is worn by respectable mechanics and others.) They are unable to procure proper food, and are often driven to intemperance to forget their miseries, or to prostitution, to add to their wretched income. No wonder that they become exhausted, enervated, bloodless; and paraplegia is not unfrequently the result. I had under my care, in the hospital, this last summer, a young woman, who had once moved in a respectable sphere. She was quite paraplegic. She had been exhausted by working in the way I have described, and declared to me, that excepting dozing in her chair, she had often not slept for two nights together. She first felt vague pains in the toes, then in the knees; rigidity came on; and ultimately she became as I saw her, the lower half of her body being as powerless as if made of marble.

“ In many of these cases, no organic lesion exists; and by due nourishment, rest in the recumbent position, iron or zinc, and the subsequent application of the electro-magnetic stimulus, recovery generally takes place. These cases are little known,

and will continue (we must fear) to occur, so long as the labour of the friendless and dependent female is regarded with no more feelings of sympathy or humanity than the amount of duty performed by a steam-engine, or any other machine.

“ In thus advocating the electro-magnetic current as an important and most valuable excitant of paralyzed muscles, I must still acknowledge that it is any thing but a universally successful remedy. In the great majority of forms of palsy above described, it is indubitably, in some, the actual curative agent; in all, it expedites and aids the cure; in none is it injurious. As a general rule, I think it will be found *cæteris paribus*, to act most effectually in proportion to the acuteness of the case. In chronic paralysis, we must recollect that any new tissue deposited during, perhaps, many months, or longer, although organized like the healthy structure, and provided with its due supply of nerves, is still composed of fibres which have never obeyed the influence of the will—have never moved at the volition of the patient. This I believe to be the reason of our not at once rousing a long paralyzed muscle into action. We can here only expect to succeed by submitting the paralyzed part for a long period to the influence of the remedy. I cannot conclude without urging upon the profession the impropriety and mischief of using electricity in some cases merely because paralysis exists. In true spinal paralysis depending upon organic lesion, the electro-magnetic current often does mischief, especially where there is subacute inflammation, or a highly irritable state of the spinal marrow—a state of things shown, among other symptoms, by the involuntary

and unconscious starting of the legs. In all such cases, the remedy does no good, and in some it does great harm, the effect of its local irritation, when applied to the legs, appearing to be reflected to the spine, and greatly increasing the patient's sufferings."

It is somewhat amusing to see in Dr. Bird's letter, how fearful he is that this simple agent should come to be used by non professional men to cure themselves. He thinks it high treason for any one to use it who does not belong to *the profession*, and says, that "every guinea taken by the irregular practitioner, is to be legitimately regarded as a *direct robbery* committed upon the regular and educated practitioner." I am afraid that "robbery" will become very frequent, if such practices are to be so termed. It seems that the people who manage the magnetic telegraph have been galvanizing many persons for diseases; and Dr. Bird points to the fact as a fresh enormity. He does not deny that they have done good to the sick, but regards them as "*robbers*" of *the profession*. In the conclusion of the last paragraph he tries to frighten people from using it themselves, by saying that "in some cases it does great harm." But he forgets that just before he has stated, in reference to nearly every variety of paralysis, that "it is indubitably, in some, the actual curative agent: in all, it expedites and aids the cure; *in none is it injurious*." There are, certainly, some cases in which it does no good, and may even cause a temporary increase of pain, but these are very rare indeed; and even in such cases no real injury is done, for the effect ceases immediately the current is suspended.

St. Vitus' dance, epilepsy, catalepsy, hysteria, convulsions, and, indeed, every other kind of fits, or irregular nervous action, are also under the influence of galvanism more than any thing else. In some of their forms, however, magnetism or electricity is preferable, but scarcely ever does medicine help such cases.

Various kinds of tumours and swellings have been dispersed by this wonderful agent. Deafness and blindness have been cured; and even mortification has been arrested, which has led to the opinion that possibly such diseases as cancer and scrofula might be benefited by it; but as yet no positive trials have been made in such cases.

Spinal diseases of various kinds have been benefited by galvanism in an eminent degree. In those cases particularly where there is merely a weakness of the muscles; allowing the bones to become displaced, it is remarkably efficacious. The muscles are brought actively into play, while the current traverses them, and thus pull the column straight again, while their tone is so restored that they are gradually enabled to support it afterwards. I saw one instance which forcibly illustrated this. A young man had been bent nearly double with a lateral curvature of the spine, that had existed for many years. The ribs sunk in on one side till there was a depression six or eight inches deep, with a corresponding elevation on the other. A friend of mine who had a battery, determined to try the effect of it upon him, and by my advice did so. The effect upon the muscles during the application was very powerful: they contracted so strongly as to pull the body nearly straight; and in

a short time the depression and elevation began to disappear; or, in other words, the curve straightened. I saw him a short time ago, and found him as nearly straight as it is perhaps possible for him ever to be; indeed, with so little deformity that no one would notice it when he was dressed. His strength had returned, and he could keep himself upright without artificial support, and without fatigue. I never recollect seeing so bad a case so much relieved before. Another instance was that of a young lady about seventeen years of age, just beginning to lean; the curve being not more than one or two inches from the perpendicular. She had suffered some pretty strong treatment by cups and tartar emetic ointment, till her back was one mass of scars, but still was no stronger, which, indeed, was hardly to be wondered at, for such treatment is more likely to *cause* weakness than to *remove* it. In a short time after applying the battery she began to hold herself straight, and left off complaining of pain and weakness, till at length she appeared perfectly well, and has remained so ever since.

Curvature of the spine may arise from two causes—from decay of the bone, or from weakness of the muscles; but there is seldom much distinction made between the mode of treating it, though its origin may be so different. The back is blistered, cupped, leeches, and covered with issues, but seldom with the slightest benefit. It is more than probable that when a recovery takes place under such treatment, it is rather in spite of it than by its means. In case the muscles are weak, we merely want to strengthen them, and attend to the

general health. For this purpose the shower bath, good friction, attention to diet and regimen, and the application of galvanism is generally all that is required. This weakness is frequently caused by want of sufficient exercise in the open air; by long sitting in constrained positions, and by wearing corsets. It is seldom found among young men, but is very common with young ladies, particularly those who are brought up fashionably, and trained at boarding schools. Dr. Forbes states that he inspected one of these establishments containing forty pupils, and that he did not find one who had been there over two years, whose spine was not more or less crooked. This is a striking instance of the injury the community suffers from the general ignorance upon physiological subjects. Neither the parents nor the teachers of these young persons were aware that their physical training was wrong, nor could they understand that it was so, even when told. They could not see that in attempting to deform the waist, by making it thinner than nature designed it to be, they ran the risk of deforming the spine also; to say nothing of diseasing the lungs, stomach, and other organs; and all from a mistaken idea, that what is unnatural is beautiful.

Decay of the bones must always cause more or less deformity, and will, ultimately, lead to fatal results if not checked. The causes of this terrible affliction may be either constitutional diseases, as scrofula, or direct injuries from blows. Sometimes the decay stops spontaneously, and when it does not do so, we are acquainted with but few means of arresting it. It is notorious that medical treatment scarcely ever does so, and hardly any two

practitioners advise the same course with it. Even here I believe galvanism, particularly the primary current, is fully equal to any other means used; and, when combined with proper constitutional treatment, it is probably the best agent we can employ. A simple curvature, from weakness, will occasionally produce decay of the bones, if allowed to continue too long, by causing unequal pressure upon different parts of their surfaces.

Intense mental application, and any other causes which produce exhaustion of the nervous energy, are very likely to lead to spinal affections in young persons, by their injurious effects on the brain and spinal marrow.

The primary current has also been used in dispersing accumulations of fluid in various parts of the body, particularly in hydrocele. The following cases are quoted from "The New York Journal of Medicine and the Collateral Sciences," for July, 1843, to illustrate the usual mode of proceeding.

"On Electro-Puncture in Hydrocele, with Cases. —By F. Campbell Stewart, M. D.

Numerous and diversified as are the methods in use for the treatment of serous effusions, and of hydrocele in particular, we still have another in the proposed application of electricity, as a curative means in this disease.

The attention of the profession in Europe was first attracted to the subject, by the publication of a case,* which was stated to have been successfully treated in this manner by Dr. Zanobi Pecchioli,

* See *Bulletino delle Scienze Mediche*, number for September, 1841.

surgeon to the hospital attached to the University of Sienna, with whom the idea appears to have originated.

“The reasons given by the Tuscan surgeon for departing from the established methods of treatment by incision, excision, or injection, ‘because of the pain of the former, and the insufficiency of the latter,’ appear futile; and it would have been as well for him to admit frankly that he was desirous of performing an *experiment*, in which he had reason to anticipate success. It matters but little, however, what motives may have induced him to resort to the use of galvanism; for his success in the case, which I shall presently report, and likewise the successful termination of other cases operated, justify the innovation.

“Immediately on the publication of Dr. Pecchioli’s case, a distinguished surgeon of Paris, Dr. Leroy, undertook to repeat the experiment, with the view of ascertaining the just value of this new method, as a therapeutic means; and as several cases of hydrocele existed in the public hospitals at the period, no difficulty was experienced in procuring subjects fit for, and willing to submit to, any operation that might be proposed for their relief. Before, however, proceeding to give the details of the cases in which I assisted Dr. Leroy, it will be better to communicate a brief summary of that of the Italian surgeon.

“*Dr. Pecchioli’s Case.*—The subject in this instance was a young man, nineteen years of age, and of good, healthy constitution. He had had for three years a considerable swelling of the scrotum, which made its appearance without any apparent cause,

and had, so far, resisted every method of treatment. On his admission into the University Hospital at Sienna, a simple, double hydrocele was immediately diagnosed; and, for the reasons above alluded to, the surgeon to the institution decided on applying galvanic electricity for the purpose of exciting the absorbents, to an extent to enable them to take up the effused serum. Accordingly, he proceeded to introduce four needles into the scrotum; two on each side, one at the summit, and one at the base of each tumour; which enabled him to establish a galvanic current through the sacs, as soon as the needles were brought into contact with the respective poles of a small battery. The application of the electricity was continued for five minutes, during the whole of which time the patient experienced acute pain in the right testicle.

“As soon as the needles were withdrawn, it was perceived that a decided change had taken place in the size of the two tumours; and they continued so rapidly to diminish in volume, that at the expiration of *five hours* they appeared almost entirely empty. Towards evening of the same day, however, there were developed considerable heat and redness of the part, and the liquid reaccumulated so as to equal, if not surpass, the original quantity.

“After the interval of a few days, the operation was repeated, and again produced a similar result.

“Not discouraged by this apparent want of success, the surgeon had recourse, for the third time, to the same means, a few days after, and on this occasion had the satisfaction to see his endeavours crowned with success; for the effused liquid became entirely, and, as he asserts, *permanently* ab-

sorbed, without any other means having been used than those indicated.

“At the expiration of fifteen days from the last operation, the young man was discharged from the hospital as cured, since which time nothing has been heard of him.*

“It is to be regretted that the person who reported this case for Dr. Pecchioli did not enter more into its details, and communicate distinctly the *modus operandi*, with the size and power of the battery used, &c., &c. These omissions will, however, be rectified in the cases which I am about to recite as having been treated by Dr. Leroy and myself.

“*Dr. Leroy's first Case.*†—François Vray, a gardener by profession, aged seventy-two years, entered the ward Sainte Marthe, at the Hotel Dieu of Paris, on the 8th of December, 1842, with a hydrocele of the right side, which was of ten years standing, and had continued gradually to increase in size up to the period of his admission. During the absence of M. Roux, surgeon-in-chief, Dr. Leroy obtained permission, and the consent of the patient, to try the effect of galvanism in his case. Accordingly, on the 22d of December, he caused a small battery, of sixteen pairs of plates, two inches square, to act on the hydrocele, through two needles, placed, one in the sub-cutaneous cellular tissue of the scrotum, and the other penetrating into the cavity of the tunica vaginalis.

* This case will be found in a review of the Italian Medical Journals, in the Gazette Medicale de Paris, for 1841, page 805.

† I give this and the following cases from my private notes. They have never before been published that I am aware of.

“ The operation caused some pain at first, which, however, soon subsided. ’ It was continued during twenty-five minutes.

“ In two days after the first application of electricity, the tumour had disappeared entirely. On the 1st of January, however, a small quantity of serum reappeared, which induced M. Leroy to operate again on the following day. As the patient appeared to suffer considerably on this occasion, the needles were withdrawn in twenty minutes. On the 12th of January, the hydrocele was found to be wholly dissipated with the exception of a very small collection, probably a thimbleful, at the lower part of the scrotum. The galvanic current was made to act on this point for ten minutes, during which period the patient complained more than he had yet done. In two weeks from this time, the effused liquid had all been absorbed, and the patient was considered as cured.

“ *Dr. Leroy’s second Case.*—C. J. Dusart; who had suffered with a large hydrocele of the left side for twelve years, was admitted into the wards of Professor Blandin, at the Hotel Dieu, (Salle St. Jean, No. 36,) on the 23d of December, 1842.—He was a baker, and aged fifty-five years. He had undergone no treatment at all prior to his entrance into the hospital. Besides the principal disease, which, as stated, occupied the left side, there was likewise a very small collection on the right side of the scrotum.

“ On the 30th of December I assisted M. Leroy, who operated in precisely the same manner as described in the last case. The action of the electric current was kept up for twenty-five minutes, as in

the first operation on Vray. The patient complained that the pain was very severe *at first*, but stated that it gradually diminished until towards the close of the operation, when he experienced no sensation whatever.

“On January 2d, three days after the operation, M. Blandin and others, who had previously seen the patient, admitted that a considerable portion of the liquid had been absorbed.

“From this period, up to the 12th of January two more applications of electricity were made, after each of which there was a perceptible diminution in the size of the tumour; and on the third of February, Dusart was discharged from the hospital as cured.

“*The Author's Case.*—Jules Mayer, a porter, aged forty-one, presented himself for examination when I was attending with a friend at the Bureau Central of the public hospitals at Paris. He had a large tumour on the right side of the scrotum, which was of comparatively recent date, having made its appearance about ten months previously. After a proper examination, it was easy to detect the existence of a simple hydrocele. The man was in good health, and had never suffered from anterior diseases.

“On my proposing to him the application of galvanism, he readily consented; and having procured proper needles, and borrowed a battery of similar power with the one used by Dr. Leroy, I proceeded to operate in the following manner:

“The patient was placed in a recumbent position, on a settee, and had the pelvis and lower limbs slightly elevated above the rest of the body. Having

ascertained the position of the testicle, I introduced one of the needles into the cavity of the sac, and endeavoured to keep it in contact with its parietes. The second needle was placed, very superficially, in the loose cellular tissue of the scrotum, and as far as possible from the first.

“There was little or no pain occasioned by the introduction of these instruments; nor did the patient complain at all, except at the moment when the galvanic current was set in motion by the application of the two poles of the battery to the eyes of the needles, when he experienced a smart *burning* shock, which caused him to start.

“I allowed the action to be kept up for thirty-five minutes, and occasionally added a little more acid to the solution in the trough, to keep up the supply of electricity.

“On withdrawing the needles, it was perceived that small, red pimples had made their appearance at the points where they were introduced. These, however, disappeared in the course of an hour.

“Mayer came to me, as I had requested, in four days after the operation, when on examination, and by measurement, it was found that the tumour had diminished to nearly one-third of its original size. I directed him to continue the use of a suspensory bandage with which he had been supplied, and to rub in a little mercurial ointment, every morning and evening, which he continued to do until the end of the week, when I again saw him. On this occasion, there remained but so trifling a collection of liquid as to render the detection of its presence somewhat difficult.

“Being on the eve of departing from Paris, and

unable to attend to him further, I directed my patient, in case of necessity, to apply to my friend Dr. Leroy, to whom I had already related his case. Since then I have heard nothing of him, and conclude that, as he has not yet visited Dr. Leroy, his relief has, thus far, been permanent.

“From the success attending this new method of treatment, in the above cases, it would appear at least to be worthy the consideration of the profession, and to merit a closer inquiry into its actual value.”

Some time ago I applied it myself in a similar case, and fully succeeded in dispersing the fluid by three applications. In another case I tried the secondary current, by means of an electro-magnetic machine, and with equal success. I am inclined to think, therefore, that either will serve, and that the mode in which each acts, is, in the words of Dr. Pecchioli, by “the excitation which it occasions to the vital properties of the affected membranes.”

I have also used the secondary current with equal success, in several cases of fluid accumulations in the lower limbs, particularly in what is called dropsy of the ancles, and feet, and I am strongly convinced that all cases of dropsy, both local and general, are more likely to be benefited by its agency than by any other. We know very well that *medicines* in dropsy are nearly always either useless or injurious, and that the patient is better without them. If, however, we can promote the absorption of the fluid, and so restore the vital powers of the system as to prevent more being formed, a cure may be expected. Nothing is so likely to bring about this desirable result as galvanism, and it ought to be re-

sorted to in all such cases in the very first instance. The mode of applying it, which I would suggest in such cases, is by means of a collection of small sharp points, made to just penetrate the skin. They may be placed in a single row, like a comb, or in a mass like the bristles of a brush. One pole should be in connection with the points, and the other on the spine, but they should be reversed frequently and suddenly, so as to stimulate as much as possible. This mode of operating is also very useful in many other cases, particularly chronic rheumatism, and paralysis.

Galvanism is also of the greatest service in that large class of diseases called *nervous*, which are so common among females, though met with occasionally in the other sex. It is not possible to describe these distressing diseases with any precision, since they assume so many different forms. Lowness of spirits, dullness and languor, inability to think, or even speak to those around, irritable temper, and apprehension of some unknown danger, accompanied by loss of all hope for the future, and such a feeling of intense wretchedness that life becomes a burden. These are some of the most prominent symptoms, but they are often modified, or accompanied by others, and sometimes they are found in connection with bodily disease, though at other times no derangement whatever can be discovered. No other diseases cause so much misery as these; severe pain can be borne much better, and would often be preferred. They are also much aggravated by want of sympathy from those around; arising from ignorance of their real nature. People are apt to look upon these nervous persons as *bored*,

and to think that nothing at all is the matter with them. The expression—"oh! it is only nervousness"—or, "it's all imagination," are very common, and arise either from ignorance or want of feeling. The sufferers themselves are often aware that there is no real cause for their unhappiness, but still they cannot shake it off, and when they meet with harshness, or neglect, it makes them worse. A little sympathy and encouragement will often accomplish wonders, and, as they cost nothing but the exercise of good nature, might be administered much more frequently than they are. In fact this moral treatment is absolutely necessary to the success of any plan of treatment whatever, and must therefore not be neglected. Medicines do no good in such cases, but, on the contrary, frequently aggravate the evil, by weakening the body and irritating the mind. Change of scene, climate and occupation, are the best means we can use, but where they cannot be obtained, we must pay as much attention to the general health as possible, encourage cheerfulness and hope, and employ galvanism to the whole body. Thus, by stimulating the whole nervous system, rouses it from that state of torpor into which it had sunk, restores to the mind its activity, and to the feelings their calmness and repose.

I myself regard lowness of spirits, inactivity of mind, and irritability of temper, as being often mere symptoms of disease in the nervous system, and I have no doubt but we shall eventually treat them as such. Instead of mere expostulation, or punishment, we should try and alter that state of the body which produces them, and to effect this nothing is

so good as galvanism; used in connection with other means it scarcely ever fails. It should never be forgotten that the mind, and the feelings, can be influenced by remedial treatment the same as the body, and that bad temper may be often cured equally with bad digestion, and by a very similar process.

In all those diseases peculiar to the female structure galvanism is our only certain reliance, and in barrenness, or sterility, no other means can compare with it. If the plan of the present work allowed of it, I could give some remarkable instances of its great use in suppressions, irregularities, discharges, and periodical pains, particularly when spasmodic. I have seen it act almost instantaneously in relieving the agony of the sufferer, after laudanum had been taken till stupefaction ensued, without giving the slightest ease. Indeed I regard it as so certainly beneficial, in these, and many other cases, that I scarcely ever think of its failing, and always resort to it in the very first instance. Its advantages over medicines are evidently very great; for, besides doing more good at first, it does no harm afterwards, but on the contrary much benefit is frequently experienced long after its application has been suspended. This I have often observed when the primary current has been used to cure hæmorrhoidal, and other discharges, which it has done speedily and permanently, without any kind of inconvenience following its application. It is also strikingly exhibited when it is used to facilitate tedious and dangerous parturition. The only means formerly relied on in such cases were drugs, particularly the ergot of rye; these sometimes suc-

ceeded, but often failed, and were always more or less dangerous both to the mother and the child. The most fearful convulsions, delirium, and even death, have followed its administration, and few I believe escape without some injury. It is but recently that galvanism has been employed in these cases, but so much success has already attended it, and such perfect safety in every instance, that it must speedily come into general use. Several cases of this kind will be given, selected from a large number that crowd our medical journals, showing the certainty of its action, and the perfect safety to the patient, both at the time and afterwards.

Many females suffer much from *cold feet*, owing to a languid circulation of the blood in them. Warming them at the fire, using warm baths, and friction, affords temporary relief, but does not cure. The application of the battery for a short time expands the minute blood-vessels, accelerates the circulation, and causes a natural warmth that does not disappear. In short, either as a means of relieving pain, or restoring suppressed or irregular action in any part of the system, it is as certain of doing good, when properly used, as drugs are uncertain and injurious.

In Europe many excellent works have recently been published on this subject, one in particular by M. Matteucci, entitled "*Traite des Phenomenes Electro-Physiologiques des Animaux.*" The same author also made a report on the subject, assisted by M. Longet, to the Academy of Sciences, which was awarded a gold medal by the Royal Society. The different medical periodicals also contain numer-

ous cases of its various uses, some few of which we will quote.

From the Provincial Medical Journal, Dec. 1844.

“On Galvanism applied to the Treatment of Uterine Hæmorrhage.—By Thomas Radford, M. D.

“I was consulted by my friend, Doctor Goodwin, in a case of protracted labour, where the long forceps were required. The lady recovered well, with the exception of not being able to pass her urine. We administered all the usual remedies for a fortnight or more, using the catheter twice, sometimes three times a day, but without the least amendment. Upon Dr. Goodwin’s suggestion, we decided upon the application of galvanism, which was undertaken by him, and the result was most gratifying, for the first application proved permanently successful. The decided efficacy of this plan in restoring the energy of the bladder, immediately led me to conclude that it was the very agent that I have already stated was a desideratum to insure uterine contraction in cases of severe flooding, attended with exhaustion.

“I mentioned my views to a number of medical friends, who generally much approved of them; and I was soon enabled practically to prove their correctness, by being called in consultation to a case of frightful hæmorrhage during labour, attended with extreme exhaustion, and where the os uteri was so rigid that the advocates of delivery could not possibly have carried their views into practice, without lacerating the os and cervix uteri. By this case I

ascertained that galvanism produces an effective and powerful contraction of the uterus; and not only as regards its tonic contraction, but it has also the power of energetically exciting alternate contraction when applied at intervals. I can tell you most seriously and most solemnly, that it produces these two important changes upon the uterus in such a degree as, in my previous reflections on the subject, I had no conception of. The alternate contraction excited by this agent is analogous to, and as powerful as, that which is observed in normal labour, and the tonic contraction is greater. I shall not relate cases in detail, because it would occupy too much time; but I may state that I applied galvanism in a case where the membranes were unruptured, and the uterus in a state of great inertia, and alternate contraction was immediately produced. Before this the membranes were very flaccid; but as soon as the galvanic circle was completed, they became extremely tense, and protruded low down into the vagina; and this state of tension did not subside when the alternate contraction ceased, as is observed in some degree in normal labour; for although the galvanic conductors were removed, so great a degree of tonic contraction of the uterus had been induced, that this membranous bag could not collapse.

“I am thus satisfied, that by the application of this means, we can induce such a state of chronic contraction in the uterus, that in these extreme cases of exhaustion from hæmorrhage, the woman may be placed in such a state of safety, that delivery may be postponed until a time arrives when it can be safely accomplished, and in the mean time

we can have recourse to those measures which tend to raise the vital powers.

“I think it probable that it may also produce one of the other natural means of suppressing hæmorrhage which I have already referred to, viz., coagulation of the blood; but this I have not yet positively ascertained by experiment, although I am led to conclude that such is the fact, from some remarks made by Dr. Apjohn, in the article *Galvanism*, in the *Cyclopædia of Practical Medicine*.

“In my own mind I am satisfied as to the influence of galvanism, and its power of producing uterine contraction. I am also convinced that it has no evil influence on the life of the child in utero, and after its birth that it is an important means of resuscitation in cases of asphyxia.”

“*On the employment of Magnetic Electricity in certain forms of Paralysis.—By J. M. Neligan, M. D., &c. &c.*

“The first case was that of a girl nine years of age, who had paralysis of the right sterno-mastoid muscle, resulting from inflammation of the cervical fascia. This took place in Nov. 1843; the result was wryneck; the right sterno-mastoid was paralyzed, and the left having nothing to antagonize, it assumed a state of spastic rigidity producing this deformity. The treatment at first was small doses of saccharated carbonate of iron, with the view of improving the general health, and afterwards to make use of magnetic electricity. In three weeks' time, he says,

“I commenced the use of the electro-magnetic machine with the child by applying the conductors

of the instrument in which pieces of sponge, moistened with salt and water, were fastened, one to the origin, and the other to the insertion of the right sterno-mastoid muscle. The application was at first continued for only a quarter of an hour, but was gradually prolonged until she could bear it for half an hour at a time, which period I never exceeded. The weakest power of the instrument was used, and it was applied only twice a week. After the third or fourth application, a decided amendment was visible; the sternal end of the muscle being the first to regain its power, as was evident from its becoming fuller, and contracting more strongly under the shocks. The head gradually assumed its natural position, and was perfectly straight on the 20th of May, at which time, also, not the least difference in the developement of the muscle of either side could be perceived.

“In this case the result of subsequent experience leads me to believe, that the cure would have been much accelerated had the electrical shocks been more frequently applied; but as it was the first case in which I employed the electro-magnetic machine, I was cautious in its application.

“The second case in which Dr. Neligan tried it, was one of painters' colic, succeeded by almost complete palsy of the muscles of both fore-arms. After the colicky pains were removed and bowels opened, he was subjected to the influence of magnetic-electricity: though previously he could not stir his hands, they immediately closed on the conductor. The application was continued for half an hour at a time, and in four weeks he was quite cured. The next was a case of paralysis of the

right shoulder, from the effects of damp. He was a sailor, and had slept for nights together in wet clothes on deck: his right arm at first began to feel heavy and numb; it pained him to stir it: and he gradually lost all power over it. Blisters and moxas had been applied without any benefit. Electro-galvanism was at length made use of by Dr. Nelligan, on the 20th of December, and by the 30th he could use his arm nearly as well as ever."

"Case of Poisoning by Opium, in which Electro-Magnetism was employed.—By J. J. Colahan, Esq.

"An infant of perfect conformation had been given twenty-five drops of laudanum to procure sleep. This was at one o'clock, P. M.; at eight o'clock, Mr. Colahan saw the child; the respiration was hurried, occasionally there was stridor, with other signs of acute bronchial irritation; the pulse rapid, but distinct; the physical symptoms, Mr. Colahan remarks, constituted a group exactly resembling laryngitis. An emetic was ordered; in eight hours' time profound torpor and sleep came on, when another emetic was given, and means adapted to rouse the child.

"Tartar emetic solution was given every ten minutes in half grain doses, in order to relieve the lungs of the mucous. In spite of every effort, the vital energy began to decrease, and Mr C called in Dr. Barry, surgeon to the Maternity Hospital, who suggested the use of galvanism. It was immediately had recourse to.

"The strength of the galvanic current was at first comparatively feeble; the shock caused by its in-

fluence, although perceptible, was slight, and proportionally diminished after application to the different most sensitive parts of the body. The strength was now increased by sulphuric acid, and a rapid current of electricity developed, to the powerful stimulus of which the infant was exposed, alternately applied to different parts. The physiological effect was now apparent, and it was not until the regulator was moved to its highest point, and the flow of electricity had reached its maximum intensity, that complete signs of revival were produced, causing involuntary muscular contractions, with frequent voluntary efforts of the child to get released from its painful position. The galvanic influence was not deemed prudent to be discontinued for five hours, at the close of which sensibility was evident and complete, with restoration of the functions of the nervous centres. Gradual and progressive recovery continued, and in a few days the infant was perfectly convalescent."

“ Electro-Magnetism in lingering Labour from Uterine Inertia.—By Mr. Clarke.

“ At a meeting of the Obstetrical Society of Dublin, in January last, Mr. Clarke gave the detail of two cases in which he employed the induced electro-magnetic current with perfect success, in the Rotunda Lying-in-Hospital of this city, in February, 1845, in one of which the membranes had been ruptured forty-nine hours, and in the other the labour had lasted sixty hours, and in each case the child as well as the mother, did well. Mr. Clarke also remarked that although this agent had been previously employed in uterine hæmorrhage by Dr.

Radford, of Manchester, yet that he believed that these were the first cases in which it had accomplished parturition. And after describing the method which he deems fittest for the application of the power, namely, from over the sacral plexus of nerves to the recto vaginal septum, as near the os uteri as can be done without passing the current through the head of the infant (the vaginal director being coated with sealing wax varnish, except at its external ball) : he described some experiments made upon the lower animals, by means of which he proved the superiority of galvanism beyond electro-magnetism in exciting the action of the heart and vermicular motion of the intestines, after both these functions had ceased from asphyxia."

In the same journals numerous other cases of a similar nature, by different physicians, are recorded, along with many curious experiments on the recovery of animals from drowning, and poisoning, by means of galvanism. The primary current has also been tried, and apparently with success enough to warrant a further trial, as a means of dissolving the stone in the bladder; and when we recollect what a wonderful decomposing power it possesses, this result will not appear unlikely. The time may come when the fearful operation of cutting out the stone may be unnecessary, through its means.

Much attention has lately been directed to a mode of applying galvanism on a small scale, by combining two opposite metals in the form of rings or bands to be worn on the body. These being easily made, and the idea being novel, they have come extensively into use. The extent to which

these may have benefited, it is as yet impossible to say. since they are worn in every form and variety of disease, without any inquiry being made as to whether they are suitable or not to the cases. There is no doubt but many people have found themselves better after using them, and possibly many more may do so when they are employed in a systematic manner. Few persons are aware that a simple combination of two metals, as zinc and copper for instance, is capable of exhibiting galvanic power; but the fact is easily proved. If a small silver coin be placed under the tongue, and a similar bit of zinc on the top of it, without their touching, and then the edges of the two be brought together, a weak but distinct shock will be felt on the tongue the moment they come in contact. A peculiar acid burning taste will be experienced which will often remain for some time after.

If the piece of zinc be pressed up between the upper lip and the gums as far as possible, and the eyes be closed, a bright flash will be seen when they touch. If a leech or worm be put upon a large silver coin, and that upon a larger piece of zinc, the animal will experience no inconvenience as long as it touches the silver only, but if it extend any part of its body on to the zinc, so that it touches both metals at the same time, it will start back instantly as if it had received a painful shock. Some animals can even be killed by these means. This explains an easy method of preventing snails and other insects from mounting up trees. If a band of zinc, and one of copper be placed around the trunk, the animal will stop when it reaches them, for immediately it attempts to pass from one

to the other, it receives a shock that makes it recoil. The presence of moisture, however, is indispensable in all these experiments, because without it there is no chemical action. If the tongue and gums be perfectly dry, no taste or flash is experienced. And if the metals and the animal be dry also, no inconvenience is experienced by them when crossing from one to the other.

These experiments all prove that the smallest combination of opposite metals produces a primary current of galvanism, providing moisture be present. The galvanic bands and rings, therefore, have a certain degree of power, which *may* exert a curative action. This is proved by the fact that they will often cause considerable eruption on the skin, under where they are worn. I have known this sometimes be so deep as to take a long time to heal, and to be quite as marked as the hydropathic crisis. This eruption will sometimes even attend the use of the battery, and is by some regarded as a favourable sign. Many persons experience a tremor in the limb on which one of these bands is placed, and I have often known one bound round the head produce so strong an action, that it could not be worn many minutes at a time. This subject is yet in its infancy, and it may become of more importance, eventually, than many persons think possible. It deserves more attention from scientific physicians than it has yet met with. At present these instruments are frequently made by persons who know nothing about the principles of galvanism, and are so constructed that they have no power at all. In all cases it should be recollected, even when properly made, their power is very weak and uncer-

tain. The battery itself cannot be superseded by them, and should always be preferred when it can be obtained.

RELATIVE VALUE OF THE DIFFERENT THERAPEUTIC AGENTS.

Having thus explained the nature and mode of action of the different therapeutic agents, we must next say a few words as to their relative value, and when each should be employed. The facts we have given make it extremely probable that all of them may be serviceable when rightly used, and though some may be applicable to more cases than others, and be more successful, yet still those others may do good when every thing else has failed. Neuropathic agents certainly stand first, as being more generally applicable, more powerful in the early stages of disease, and less capable of injuring afterwards. Chemical agents are rather last resorts—desperate remedies—evils in themselves, and only to be used to overcome greater evils.

As a general rule, we should employ direct neuropathic agents, either natural or artificial at first, unless there are good reasons to the contrary. They are certainly the most effective in the nervous stage of diseases, and generally so, in the organic. Even when structural decay has commenced, the primary current of galvanism will frequently arrest it as certainly as any other means we can employ. Chemical agents, or drugs, should only be used when all these means fail, or when they cannot be

employed and the simplest of these, as homœopathic or galvanic medicines, should be used first. These may reach deep seated or minute parts of the system, that are inaccessible to galvanism, electricity, or magnetism, as these agents operate more on the surface and large organs. When all the preceding means fail, we may resort to allopathic medicines, using, however, the mildest and the smallest doses we can. It should never be forgotten, that these active drugs are mostly *poisons*, and that they are only taken to destroy or remove other poisons engendered in the system by disease; if, therefore, more is taken than what will exactly overcome the disease, the system begins to be acted upon, or poisoned by the medicine itself.

Mesmerism is more applicable to general nervous debility and irritation, arising from moral causes, or from mental agitation and excitement.

Hydropathy is a powerful neuropathic agent, often stimulating the whole nervous system more than any other. It seems more applicable to the nervous stage of disease than to the organic; and to general or constitutional derangement, than to local affections. It is, undoubtedly, preferable in numerous instances, to drugs, though like them, it is not unattended with danger if used indiscriminately. As an adjunct to other means, the application of water, in various ways, is often of great service.

In a very great number of cases, probably the great majority, none of these kinds of treatment can be of the slightest utility, and none ought to be recommended. It is a great error on the part of the public to suppose that every disease is capable of being benefited by medicine; and it requires no

little moral courage on the part of the physician to undeceive them. I have often spent an hour with a patient, trying to persuade him to *take nothing*, and sometimes have lost his patronage because I refused to write a prescription for him. Many of these persons have gone elsewhere, got well drugged, and came back at last to say they were worse than before.

In all cases where medical agents are not positively indicated, it is better to merely give general rules as to diet, clothing; and mental and bodily occupation, so as to leave nature free to act for herself. Moral and mental treatment is frequently of paramount importance, and is all that needs attention.

DUTIES OF A PHYSICIAN.

A physician should endeavour to keep himself free from all prejudice for or against any mode of treatment. According to the best of his judgment, he should advise his patient to that course which his judgment and experience points out as the most likely to do him good. He should never be ashamed or afraid to admit his ignorance, or inability, in any case which he does not fully understand; and he should never object, when he has failed himself, to his patient trying any other means which give the slightest prospect of benefit, even though their success should prove his own incapacity. In a word, the relief of human suffering should be his object, and not the maintenance of any particular system of practice; and his consolation should be found in the consciousness of having laboured to do good, instead of gratifying his own pride and vanity by carrying out certain whims and notions, regardless of their effects.

In spite of his knowledge, however, and notwithstanding his honesty, the physician is often baffled by disease, as too many unfortunate patients can testify. There can be no doubt but that much more good can be effected by teaching human beings how to avoid disease, than by all our attempts at cure. This invaluable knowledge, unfortunately, is but slowly acquired by the community at large, but individuals may often profit by it to a great extent. The physician should make his patient a study, both bodily and mentally—he should ascertain his

peculiarities of constitution and neuropathic action, and ascertain his precise relation with the various circumstances around him. The causes of disease may be very slight, and apparently of little moment at first, though productive of the most serious effects; and it is the business of the physician to make them known in time, if possible, so as to avoid their effects. The dress, diet, habits, occupation, mental pursuits, and many other circumstances require to be well considered, and their fitness or unfitness for the individual ascertained. It is in this way that much real good may be done, though not, perhaps, with great *eclat*. This, however, should never be thought of for a moment. The man who can teach another how to avoid a disease which would necessitate amputation, if it became established, is more useful than he who can merely cut off the limb when it is diseased, let him do it ever so cleverly—and the result of his labours will certainly be more pleasing, both to himself and the patient, though no great noise may be made about it. Very often the most useful advice a physician can give to a patient is *to take no medicine at all*. It is true such advice is not likely to be appreciated by some people, and may even injure him with others, but that should not prevent its being given when proper. It should always be a fundamental maxim in curative treatment to *rather do nothing at all, than do any thing which can possibly injure!*

ADDENDA.

The following account of Dr. Ure's experiments with galvanism upon a criminal who had been hung, are introduced as being the most complete and interesting of the kind ever performed. These experiments are well known by medical men, but as a majority of the public are unacquainted with them, I concluded they would be found generally interesting, as well as being useful to illustrate the subject.

"A middle-sized, athletic, and extremely muscular man, about thirty years of age, was the subject of the following highly interesting experiments. He was suspended from the gallows nearly an hour, and made no convulsive struggle after he dropped; while a thief, executed along with him, was violently agitated for a considerable time. He was brought to the anatomical theatre of our university in about ten minutes after he was cut down. His face had a perfectly natural aspect, being neither livid nor tumefied; and there was no dislocation of his neck.

"Dr. Jeffray, the distinguished professor of anatomy, having on the preceding day requested me (says Dr. Ure) to perform the galvanic experiments, I sent to his theatre, with this view, next morning, my *minor* voltaic battery, consisting of 270 pairs of four inch plates, with wires of communication, and pointed metallic rods with insulating handles, for the more commodious application of the electric power. About five minutes before the police officers arrived with the body, the battery was charged with a dilute nitro-sulphuric acid, which speedily brought

it into a state of intense action. The dissections were skilfully executed by Mr. Marshal, under the superintendence of the professor.

“*Exp. 1.* A large incision was made into the nape of the neck, close below the *occiput*. The posterior half of the *atlas vertebra* was then removed by bone forceps, when the spinal marrow was brought into view. A profuse flow of liquid blood gushed from the wound, inundating the floor. A considerable incision was at the same time made in the left hip, through the great gluteal muscle, so as to bring the sciatic nerve into sight; and a small cut was made in the heel. From neither of these did any blood flow. The pointed rod connected with one end of the battery, was now placed in contact with the spinal marrow, while the other rod was applied to the sciatic nerve. Every muscle of the body was immediately agitated with convulsive movements, resembling a violent shuddering from cold. The left side was most powerfully convulsed at each renewal of the electric contact. On moving the second rod from the hip to the heel, the knee being previously bent, the leg was thrown out with such violence as nearly to overturn one of the assistants, who in vain attempted to prevent its extension.

“*Exp. 2.* The left phrenic nerve was now laid bare at the outer edge of the *sterno-thyroides* muscle, from three to four inches above the clavicle; the cutaneous incision having been made by the side of the *sterno-cleido mastoideus*. Since this nerve is distributed to the diaphragm, and since it communicates with the heart through the eighth pair, it was expected, by transmitting the galvanic

power along with it, that the respiratory process would be renewed. Accordingly, a small incision having been made under the cartilage of the seventh rib, the point of the one insulating rod was brought into contact with the great head of the diaphragm, while the other point was applied to the phrenic nerve in the neck. This muscle, the main agent of respiration, was instantly contracted, but with less force than was expected. Satisfied, from ample experience on the living body, that more powerful effects can be produced in galvanic excitation, by leaving the extreme communicating rods in close contact with the parts to be operated on, while the electric chain or circuit is completed by running the end of the wires along the top of the plates in the last trough of either pole, the other wire being steadily immersed in the last cell of the opposite pole, I had immediate recourse to this method. The success of it was truly wonderful. Full, nay, lorborious, breathing instantly commenced. The chest heaved, and fell; the belly was protruded, and again collapsed, with the relaxing and retiring diaphragm. This process was continued, without interruption, as long as I continued the electric discharges.

“In the judgment of many scientific gentlemen who witnessed the scene, this respiratory experiment was perhaps the most striking ever made with a philosophical apparatus. Let it also be remembered, that for full half an hour before this period, the body had been well nigh drained of its blood, and the spinal marrow severely lacerated. No pulsation could be perceived meanwhile at the heart or wrist; but it may be supposed, that but for the

evacuation of the blood—the essential stimulus of that organ — this phenomenon might also have occurred.

“*Exp. 3.* The supra-orbital nerve was laid bare in the forehead, as it issues through the supra-ciliary *foramen*, in the eyebrow: the one conducting rod being applied to it, and the other to the heel, most extraordinary grimaces were exhibited every time that the electric discharges were made, by running the wire in my hand along the edges of the last trough, from the 220th to the 270th pair of plates: thus fifty shocks, each greater than the preceding one, were given in two seconds. Every muscle in his countenance was simultaneously thrown into fearful action; rage, horror, despair, anguish, and ghastly smiles, united their hideous expression in the murderer’s face, surpassing far the wildest representations of a Fuseli or a Kean. At this period several of the spectators were forced to leave the apartment from terror or sickness, and one gentleman fainted.

“*Exp. 4.* The last galvanic experiment consisted in transmitting the electric power from the spinal marrow to the ulnar nerve, as it passes by the internal condyle at the elbow: the fingers now moved nimbly, like those of a violin performer; an assistant, who tried to close the fist, found the hand to open forcibly, in spite of his efforts. When the one rod was applied to a slight incision in the tip of the forefinger, the fist being previously clenched, the finger extended instantly; and from the convulsive agitation of the arm, he seemed to point to the different spectators, some of whom thought he had come to life.”

MATTEUCCI'S EXPERIMENTS.

These have been alluded to, but not given in full detail in the text, because not needed in a practical explanation. Many persons, however, might wish to become acquainted with them, particularly medical men who have not met with his work. I therefore thought it advisable to insert the following condensed statement from "Ranking's Abstract."

"*Animal electricity.* The highly interesting electro-physiological researches of Professor Matteucci, of Pisa, have recently excited considerable attention; the following are the chief facts established by his experiments:—*1st, Muscle is a better conductor of electricity than nerve, and nerve conducts better than brain; the conducting power of muscle may be taken as four times greater than that of brain or nerve.

2d. In the muscles of living animals, as well as of those recently killed, an electric current exists, which is directed from the interior of each muscle to its surface. The duration of this muscular current corresponds with that of contractility: in cold-blooded animals, therefore, it is greatest; in mammalia and birds it is very brief. Temperature has a considerable influence on the intensity of the current, a small amount of electricity, being developed

* Todd and Bowman's Physiological Anatomy and Physiology of Man, Part II. Also see a good review of Matteucci's *Traite des Phenomenes Electro Physiol. des Animaux*, in *Med. Chir. Rev.* April. 1845.

in a cold medium, a larger one when the medium is moderately warm. Any circumstance which enfeeble the frogs (the animals experimented on) and derange their general nutrition, will diminish the power of the muscles to generate electricity, as they also impair the contractile force. The muscular current appears to be quite independent of the nervous system. It is uninfluenced by narcotic poisons in moderate doses, but is destroyed by large doses, such as kill the animal. The development of this muscular current seems evidently to depend on the chemical action constantly taking place as an effect of the changes accompanying nutrition; these organic changes, in short, give rise to an electric current, just as do the chemical changes attending the mutual reaction of inorganic materials, such as the reaction between a plate of metal, and an acidulated fluid in the ordinary voltaic pile. That considerable chemical changes attend the process of nutrition in muscle, seems evident when we consider the constant supply and waste of material of which it is the seat, and the evolution of sensible heat which accompanies its contraction; in this way the generation of electricity can be readily accounted for; the muscular fibre represents the metal acted on in the arrangement of the voltaic apparatus, and the arterial blood corresponds to the acidulated fluid. The surface of the muscle, which is more or less tendinous, and therefore different in structure and in function from the interior, represents the second plate of metal used in the voltaic apparatus, which does not suffer chemical action, but which only serves to form the circuit. The direction of the muscular current, therefore, from the interior to

the surface of the muscle is just such as might be expected, supposing it to be due to a chemical action taking place in the interior of the muscle.

“3d. Another result obtained by M. Matteucci is the proof of the existence in frogs of an electric current distinct from the muscular current; it proceeds from the feet to the head, and is peculiar to the *Batrachian* reptiles.*

“4th. Some curious results were obtained by applying electricity in various ways upon nerves. Upon making some experiments on the sciatic nerves of rabbits, he found that upon *closing* the circuit of the *direct* electric current, or the current directed from the brain to the nerves, contractions in the muscles of the posterior limbs were produced whilst upon *opening* this circuit marked signs of pain, with contraction of the muscles of the back, and feeble contractions of the posterior limbs, were caused. Upon *closing* the circuit of the *inverse* current, or that directed from the nerves to the brain, signs of pain, contractions of the muscles of the back, and feeble ones of the posterior limbs, were produced; upon *opening* it, contractions of the posterior limbs were caused.

“It will not be misplaced to notice here the marked analogy between the actions of the electrical organ of the torpedo and those of muscular fibre, which Matteucci’s interesting experiments illustrate. Both are organized to act in a particular way; the one to develop electricity without any visible

* For an account of the experiments proving the existence and direction of this and the muscular current, see Todd and Bowman’s *Physiological Anatomy*, vol. 1, page 380.

change in itself; the other to contract, with a demonstrable evolution of both heat and electricity. Both will manifest their peculiar phenomena by direct irritation, or by indirect irritation through the nerves. Both are brought under the control of the will by the nerves; the section of which paralyses the influence of the will over both, but does not destroy the peculiar power of either. In the electrical fish, irritation of the electrical lobe of the brain is capable of exciting a discharge of the organ, just as irritation of a segment of the spinal cord causes contraction of the muscles supplied by it. A current of electricity transmitted through the electrical organ or its nerves, causes discharge; and a similar current sent through a muscle or its nerves, causes it to contract. All the circumstances which modify the nutrition of muscle, will similarly affect that of the electrical organ.”*

* Todd and Bowman, 1 c. p. 386.

THE END.

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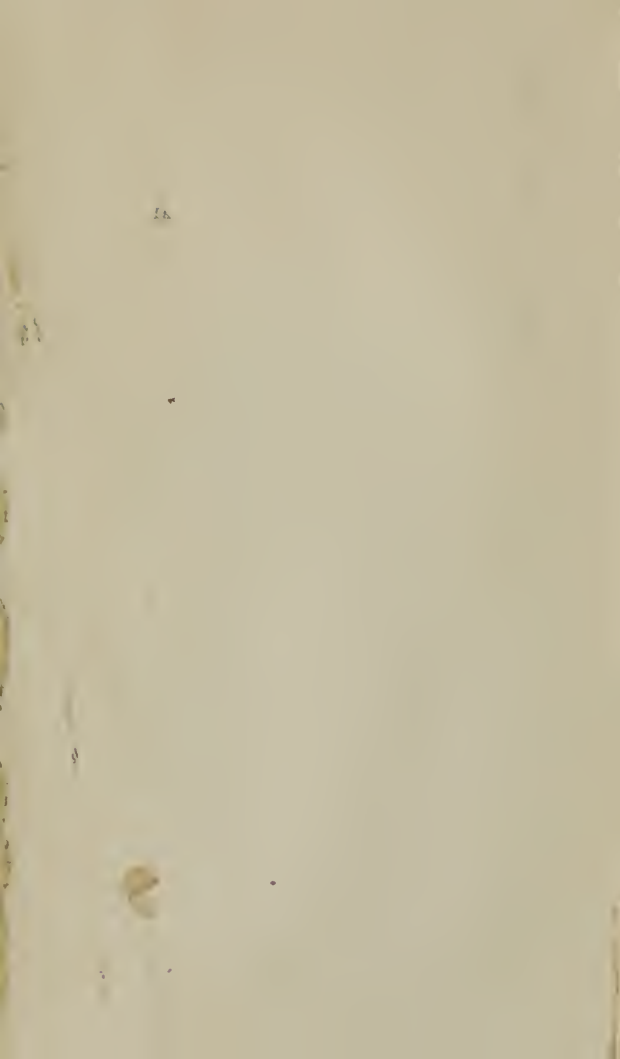
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