A sketch of the history of scientific medicine : being the introductory lecture delivered at the Middlesex Hospital Medical School, October 1st, 1875 / by B. Thomson Lowne.

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OF

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THE INTRODUCTORY LECTURE

DELIVERED AT

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL

OCTOBER 1st, 1875.

BY

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I HAVE been asked by many of my pupils and friends, to publish my introductory lecture, and I have done so from the verbatim notes of the reporter, only altering a word here and there. From want of time I have been unable to do more, and I present these pages to them, trusting in their kindness to overlook any errors in an extemporary discourse on a subject, in which we all feel the deepest interest, "the history of scientific medicine."

49 Colville Gardens, W.

Gentlemen,

I enter upon the task which has been allotted to me by my colleagues, with very mingled feelings of pleasure and diffidence. Pleasure, because I stand before you to-day somewhat in the position of a host who is greeting new faces. I am here to welcome those of you, who come to-day for the first time into the theatre of a medical school, and of course I cannot feel anything but pleasure in greeting you, because I know that to-day, at any rate, you are in earnest about what you are going to undertake. You are entering upon a profession, which we all of us feel to be a great and a noble one, and we cannot but greet you with the greatest pleasure. I have pleasure likewise in seeing around me the faces of those who have been in this theatre with me, during the last year or two, and with whom I have spent very many happy hours. On the other hand, as I have said, I come before you with diffidence, because I undertake a task which I know to be a difficult one.

Some of you have heard excellent introductory lectures before to-day, and I come before you to try and give a lecture that will satisfy you all, and I know it is an exceedingly difficult task, and therefore I undertake it with diffidence.

The theme which I have selected for this lecture, is one which I believe might be made most instructive: it is the history of scientific medicine. I met a friend the other day in the street, a man of some note in the medical world, and when I told him the subject I had chosen for this lecture, he looked at it in anything but a hopeful light. He said, "I do not know what scientific medicine is; I am afraid there is no such thing." Well, I am happy to say that I differ very much from my friend, and I believe all of you differ from him, at any rate those of you who have already undergone a course of study at this hospital. Really, the whole gist of the matter turns upon what you mean by "scientific." If you mean by a science a collection of immutable laws, or rather a knowledge of a collection of immutable laws, which may always be applied with certainty, then I am afraid

medicine is not a science. If, on the other hand, you mean by a science a knowledge of nature, then I think medicine is in itself a science and a great science; indeed it is a most ancient science, for its origin dates back, even to the origin of man himself. There is a very wide-spread opinion in the world, and always has been, that even the higher animals have some kind of knowledge of medicine. I may refer you to the old story of Polybius, the physician of Minos, who went to a snake, for the knowledge of a drug which should bring a human body to life. I may refer you to the prevalent opinion in India at the present day, that the mongoose, or ichneumon, knows a herb, which is an antidote to the deadly bite of the cobra. It is by no means an uncommon opinion amongst mankind, and I think with Herbert Spencer, that where an opinion is deeply rooted, and has long been deeply rooted in the mind of man, there is at least some little basis of truth in it. At least we must admit that some kind of knowledge of medicaments, is as ancient as man himself. Of course you can hardly call that a science. It is only an embryo science, but it is an embryo science: hence it is that the first traditions we have of medicine, are lost in the mists of antiquity, and we read of the mythic *Centaur, Chiron,* and his pupil *Æsculapius,* who was afterwards made a god of the Greeks, as the first medical benefactors of mankind. Countless ages must have passed, during which such knowledge existed in the world, but I am not aware that any man arose, who was capable of making a concrete science of our study, until about 450 years before the commencement of the christian era. When you remember that Babylon and Egypt had left almost indestructible monuments of greatness, when you remember that Greece had already given us models of philosophy, of poetry and of government, it is not a little surprising that we should come to such a recent date, before we find anything like a concrete science in medicine. But such is the case. Hippocrates was the first man who really understood how to get a mastery over nature, from a study of details. Before the time of Hippocrates, men had great theories about things; they had invented in their imagination, views to account for the phenomena of nature; but so far as I know, they did not seek

carefully for evidence; they did not really make a science of it. Hippocrates seems to have been the first man who was able, in any sense whatever, to throw off the imagination, to take facts for his basis, to work upon the facts, and so to gain a mastery over nature. Wonderful as this mastery was which he gained, it soon died out again, and for two thousand years no man arose, so far as I know, in the world, who was able to supersede Hippocrates or even to place science upon the same pedestal as that upon which he had placed it, certainly not medical science.

The medical profession may be justly proud of many of the men, that lived during that long two thousand years. Of these the most notable was Galen. Galen had great advantages, for he was the first whom the prejudices of mankind allowed to examine the internal anatomy of the human body. But Galen, although he was a man who sought for facts, did not put those facts together in the same scientific way that Hippocrates had done. His reasoning was not of the same grand nature, he was not such a close reasoner, and he did not arrive at such general truths, nevertheless what he did was much more palatable to mankind, so that he ruled the medical world with absolute tyranny for 1500 years. After the time of Galen, no one ventured to exert an influence of his own, at least no man who was well versed in medicine. Although universities were founded, although great changes took place in the world changes of a vast nature, still medicine retrograded. It never came again into the same position that Hippocrates had left it in. Indeed much that Hippocrates taught, much that was good and great in our profession was forgotten, and much that was empirical in the very worst sense of the word took its place. Alchemy was derived from the Arabs, that is to say, the very embryo germ of the science of chemistry. When men saw what could be done with the elements, what could be done with chemistry, they imagined that everything could be done, and that they should find something, which would enable mankind to live for ever—the "philosopher's stone" which would convert everything into gold. Medicine really degenerated with such men, into a magic black art, into an empiricism of the very worst kind, and not only into an em-

piricism but something worse than an empiricism. I do not say that all men were alike. There were some in those ages, who thought well and who worked well, but they followed the precepts of Galen. Whatever experience they gained they Galenised. Galen was the great master and Hippocrates was almost forgotten.

It was not until the 17th century, that another mind appeared, which was worthy (in my humble opinion) of being compared with the mind of Hippocrates. The man who possessed that mind, was a countryman of our own, and was none other than Sydenham,—Sydenham who again placed the medical profession upon a truly sound basis, a basis which we may well be proud of. But I must draw your attention to the fact, that great changes had taken place in the world, between the time of Hippocrates and the time of Sydenham, changes which had adapted men's minds to receive science in a different spirit from that in which they had received the teachings of Hippocrates. The first and foremost of those changes, was in the religious opinions of mankind. Luther had lived and had freed men, from the tyranny of a tyrannous priesthood. Not only had Luther lived, but the printing press had been invented, the greatest of all the discoveries of mankind, a discovery which enabled men to render their thoughts and their experience permanent even against the ravages of time. The printing press before the time of Sydenham was busily occupied in producing all the best and greatest thoughts of former ages, giving many the means of easily studying what had been done, and of making their own thoughts and their own words permanent. But not only had men's minds become free, not only had the printing press been invented, but Columbus and Galileo had lived—two men whose names should have perhaps, a higher place in science, than the names of any other two men. Columbus had demonstrated to mankind that the world was a globe. Long ages before his time, Pliny had come to the same conclusion, that the world must be a globe, because it was the only condition in which water could remain in equilibrium. He looked at the raindrops and the dew drops, and he said "these are globes and the world must be a globe, because the ocean is in equilibrium." But

Columbus demonstrated it to all mankind. His was a great demonstration that all could understand. Galileo had done the same with regard to the movements of the planets round the sun. Long long before Galileo, Copernicus had shewn by mathematical laws, that the planets must traverse round the sun; but even a thinker like Lord Bacon—a man who has had the credit of having produced the revival of science, or rather, having laid the foundations of all kinds of natural science—even Lord Bacon, who was a very great man indeed, a very great chancellor, a very great lawyer, and a very great philosopher, poet and companion—a man by no means to be looked upon as of mean acquirements, in those days and even of great acquirements had he lived now, could not see any reason why the laws of Copernicus, or the laws of Keppler, should be true, rather than any theory of vortices and spirals. But when Galileo turned his telescope to the heavens, and demonstrated the moons of Jupiter revolving round their planet and discovered the phases of Venus, although Lord Bacon did not accept it as a demonstration for once and for all, mankind generally did; and from that time to this, no question has been raised as to what the true disposition of the heavenly bodies is. It was by means of such great experimental verifications as those of Columbus and Galileo, that men learned to distinguish the true from the false philosophy. They saw the methods of reasoning, which had led Copernicus and Keppler to their views, and they saw that those views were true. They saw the methods of reasoning, which had led Pythagoras and Plato to their views. Great views truly; but they saw that those views were false; and I believe that from that time, men began to study philosophy by true methods.

There was a Dr. Gilbert in the time of Queen Elizabeth, a member—and a very successful member—of our profession. He turned his attention to the study of the magnet, and his work, which was published just twenty years before Bacon's *Novum Organum*, was the first really great scientific book on experimental science that was ever published in this country. It is my opinion that this book in itself, has had much to do with the success, which scientific men have had since the time of Gilbert. They took that as their model; and I think

that Bacon, when he laid down the best of the precepts contained in his *Novum Organum*, for the study of experimental science, took those precepts in the main, from the work of Gilbert. The effect which is often ascribed to Lord Bacon, I have no doubt should truly be ascribed to Gilbert. Certainly his was the first really great book on experimental science which was produced in England, and I believe the first which was produced on any subject like the magnet, anywhere in the world. It was after such men as these had lived, that Sydenham appeared, and he had the benefit of their experience.

But other men had lived in the time of Sydenham, who did great things in placing our profession upon a sound basis. Vesalius, the anatomist, had dared to question the authority of Galen, and although Fallopius was a powerful antagonist, and did all that he could to uphold the older author in spite of truth, Vesalius conquered and convinced men. Vesalius is, therefore, a name which we should deeply reverence, because he turned to truth in spite of authority. A man much better known in this country than Vesalius, a countryman of our own, had lived—the first experimental physiologist (Dr. Harvey) who, as you all know, discovered the circulation of the blood. Now, although it has been often doubted whether Harvey did discover the circulation of the blood, I think there is little doubt upon the point. Men might perhaps, before his day, have had some kind of imagination that the blood circulates; but he demonstrated it by experiment. He had seen the hearts of animals beat. He had made experiments upon their vessels, and had proved most undoubtedly that the blood circulates. He laid the foundations of physiology as an experimental science, just as Gilbert had laid the foundations of science altogether upon experiment. Boyle and Willis were living, in the time of Sydenham, and these two men, together with Beecher (whose name must not be omitted) rescued chemistry from alchemy. They had shewn that chemistry was a true science, that the study of chemistry was a study of the changes which take place in bodies. There was a new science then—anatomy; there was a new science—physiology; and there was a new science—chemistry, when Sydenham lived. The

world was ready to receive great light, and although Sydenham entered the medical profession late in life, he was hard upon forty when he became a physician, and lived only about thirty years afterwards, and *that* a life of pain and suffering; still, I think he did more for real science in medicine than any other man ever did by his own unaided efforts if we except Hippocrates alone, who lived so far back that it is extremely difficult for us to judge what the nature of his mind was. That Sydenham's mind was a very great one there cannot be the slightest doubt, such a mind as only appears once in many centuries. It was a long time, however, before Sydenham was understood in this country. The great Böerhäave, who really carried on the work of Sydenham and who took up our science where Sydenham had left it, must be thanked for having perpetuated that which Sydenham commenced, for having carried on much of the work which Sydenham only initiated. Böerhäave and his pupils did so much for medicine that we can never hold their memory in sufficient esteem. From that time to this I might give you a long list of the names of men who have worked hard and well; who have sought for truth and found it. They are the heroes of our profession. But if I were to enter upon that grand roll of great men I should keep you here long after the time which is allotted to me. I shall, therefore, merely touch upon the effect of their sciences upon our own. The medical profession owes very much to the collateral sciences, but the collateral sciences owe their existence to the medical profession. The first natural philosopher in any sense of the word as we now use it was Hippocrates, and from the time of Hippocrates to the present day the students of nature have most of them likewise been students of medicine. The first university founded was the university of Salerno, and that was merely a medical school in those days just as this is a medical school now. That was the first of all our great universities, they have all sprung out of the school at Salerno. But on the other hand we have much to thank the collateral sciences for, and of all the sciences, having thought the matter carefully over, I have come to the conclusion that we owe most to physics, and the reason of this is perhaps that the study of physics is far older than

the study of any other science; and it is to the study of physics we are most able to apply mathematical laws and mathematical formulæ. We are very much more advanced in the study of the physical sciences than in the study of what are called the "natural sciences"; and the reason is that the things which we have to work at are so much easier to study. The influence of the physical sciences has been both direct and indirect, and have already endeavoured to show you, very briefly I allow, that it has been by the study of physics that men's minds have been prepared for the study of the natural sciences. We owe the discovery of the telescope to physics, and what is much more to us, of the microscope. The discovery of the microscope has certainly made an epoch in the medical profession, and a very great epoch indeed. At first the microscope and telescope were confounded together, and it is very difficult to tell when the microscope was really first invented. It is only, however, within the last forty years that it has become the powerful instrument of research in our science that it is at present,—the means by which we shall yet work out, perhaps, some of the deepest secrets of vitality. I think that that last book by Charles Darwin, published only a few months ago, is a work which promises that we may still expect much from the microscope. The change which he has observed taking place through the functional activity of the protoplasm in plants is certainly a most marvellous phenomenon and one which perhaps, may throw more light than we can have the slightest idea of, upon the phenomena of life. Certainly it is to the microscope we owe a knowledge of the intimate structure of the animal frame; it is to the microscope that we owe a knowlege of the functional changes which take place in organs, and of their structure and development. The microscope is the basis of pathology, aud pathology is really the basis of modern medicine.

But we have to thank physics for another, and a more direct method of research, I allude to auscultation, a method which we owe to the brilliant genius of Laennec. When Laennec discovered auscultation he applied the laws of acoustics to the diagnosis of disease, and gave us one of the most accurate and useful methods of investigation. We owe

yet more to physics, in the discovery of the ophthalmoscope, and I think that a discovery which we should especially mark, for it was due to what is called "theory."

At the very outset of your career as medical men, you will be brought face to face with the rival claims of theory and practice: and you will be often told that practice is everything and theory is nothing. I tell you that for countless ages before the day of Hippocrates practice was everything and theory nothing, and medicine advanced not one jot. I tell you that from the time of Hippocrates to the time of Sydenham there were false hypotheses and practice; practice availed but little and the false theories did harm. If you could only separate the true theory from the false you would do right, but theory you must have, for it is the basis of all human knowledge. I believe myself, if you look a little closer into things, you will find that even those things which you believe to be the most certain facts, are nothing but your theories concerning something of which you know nothing. However, I do not enter upon that metaphysical enquiry, because it is one that would detain us too long, but certainly many of the things which you mistake for facts are really theories. I do not know that I can show you this more plainly than by relating to you something which Professor Huxley said in one of his lectures some years ago, on fact and hypothesis. He put it so very plainly that I do not know that I could say anything as well as he has said it, and therefore I may repeat it as nearly as I can in his own way. What Professor Huxley said was this:—"suppose that you go down to your breakfast room one morning, and you find your silver spoons and your tea-pot are gone; you find your window is open; you find the mark of a dirty hand upon the window frame, and you see the mark of a hob-nailed boot upon the gravel outside. You say at once 'I know my tea-spoons and silver have been stolen.'" Now you suppose that you know a fact, but you do not, you know a theory. You have found that entirely by theory; you do not know it, you only guess it; it is your hypothesis. It is true it is a very probable hypothesis, and that it is founded upon a number of correct inductions and deductions and upon a knowledge of the laws of human nature. Well, gentlemen, perhaps I

was a little hard on human nature, nevertheless, it is theory, so far as you know it. It is not fact, and nearly all your thoughts are theories. Facts are very dry things indeed. The only thing you have to do is to distinguish between the true theory and the false. The theory which has a foundation in fact, which is built up upon little fact and little fact, and which is really solid—you have to discover that theory, you must not take great imaginative speculations as your theories, you must not imagine that a thing is true because it might be true; you must consider what is, you must work from facts. But you cannot do without theory; without theory facts will be but a poor guide to you, you will always be mistaking your facts, and your experience will be worth nothing. I believe the experience of the human race was worth nothing as regards medicine for many thousand years; certainly the experience of the human race has been worth little without theory even up to the present day. But when you can once grasp the true theory, when you can once find the true causes of things, when you once have reasoning which is substantiated by facts, and which is built upon facts, then you can reason to the truth. Copernicus found the truth as clearly as Galileo found it; Copernicus found it in his mind, Galileo found it in his telescope.

Now let us return to Helmholtz with the ophthalmoscope. Helmholtz asked himself "why is the pupil of the human eye black? what is it that makes the interior of the human eye appear dark? why cannot I see beyond the fringe of the iris?" The answer to that question was purely a problem in physics, and the answer to that question enabled Helmholtz to see through the pupil, and to see the retina. It enabled him to present the world with the opthalmoscope, certainly a most marvellous instrument, an instrument which enables us to place ophthalmic surgery upon a true scientific basis, which enables us to work out the most difficult problems with regard to the eye with mathematical accuracy, it was the foundation of that great work of Donders, which has been published by our Sydenham Society, and which is a model of work, which is certainly one of the most marvellous books that the medical profession possesses. Therefore I say we have much to thank physics for.

Of course as surgeons we owe very much to anatomy, for unless we know our anatomy, unless we can picture to ourselves the interior of the human body we are unfit to exercise our profession. It is very obvious that anatomy is a most essential science.

With regard to physiology it is difficult to say what physiology has done for medicine at present and what it has not done. I have no doubt that it has done a very great deal. I cannot point to great epochs in the history of medicine due to physiological discoveries like those which I pointed out with regard to the discovery of auscultation, the discovery of the microscope and of the ophthalmoscope, unless I point to the discovery of the circulation of the blood by Harvey. But I have not the slightest doubt that physiology has done very much to advance our knowledge of medicine and that it will do very much more. We are only at the very outset of the science, we have only just begun to study it. Until the last twenty or thirty years physiology has been a science of the imagination. Men have given way to imagining what might be; they formed very pretty theories, they have introduced a number of unknown quantities as a mathematician introduces unknown quantities into his calculation, but they have not eliminated them. When Stahl invented his theory of a vital principle it was a very pretty theory, a beautiful unknown quantity and it served to work out certain equations in physiology; but it has not been eliminated. The time may come when it will be eliminated, it is gradually getting eliminated now, and we know perfectly well that the phenomena of the body are carried on under the same laws as the phenomena of the inorganic world.

It has only been within the last thirty years, even in Germany, that physiology has assumed the nature of an exact science. It has just begun to do so in this country, and at the very outset of our experimental work, a few very well-meaning people, people who mean well to their fellow creatures, and who mean well to the world in general, turn round upon us and say "you are doing too much, you must please to stop." It has always been the way of the world, they have always tried to stop the progress of science, but they have never succeeded yet in doing so. They may have bar-

red its progress, but it goes ever onward towards the goal which is before it and you cannot hold it back. It may be that these well-meaning people may prevent our studying physiology in this country, and will allow Germany to go on studying it to our great disgrace. The Germans will go on, the Germans will work at what they have begun, and they will have the credit for having done it.

I believe the reason why the Germans do so much scientific work, is very much to be looked for, in the preliminary education of the Germans, and I am afraid we are too conservative a country for many many years to come, to make much progress in preliminary education. I look forward to the day when every medical student, will come for the first time into the theatre of a medical school, conversant with the elementary laws of physiology, knowing his chemistry well, and knowing his botany well. I expect the time will come when no student will think of taking up medicine, without knowing well all these preliminary sciences as a boy, but that time has not come yet. And I am afraid, we are deluding ourselves in this country. We have our public schools and they profess to teach the Latin and the Greek languages. Well, there was a time when the Latin and Greek languages were the very basis of all science, because all the books were written in either the Latin or Greek languages, but that day has passed away, and the Latin and Greek languages have become scientifically useless. It may be a very nice thing for a man to know his classics. I have no doubt it is, but if a man is to lose the first third of his life in studying them, I believe it is a mistake. Under our present system I am afraid it is more than a mistake, I fear it is a sham, because men in the public schools of this day see the uselessness of the knowledge which they are expected to acquire, and they do not acquire it; they go away from these schools not with good scholarship, but able to translate a piece of Cæsar, or a piece of Cornelius Nepos, with what is called a "crib," they have wasted their time at their schools, they have got up their work badly by a "crib," they know just enough to shuffle through an examination, which is after all hardly worth passing, except for state purposes, when it is passed, and after that they have to begin life *de*

novo. It is a sad fact. I do not blame anyone for it, but it is a sad fact, and it is due to the opinions of many and great men who will not change, who cannot see that everything has changed in the last hundred years, and that whereas a classical education was very good, a hundred years ago, a classical education is worth very little now, I could not say a man who knows his classics, is not better than a man who does not know them, but I say for all the purposes of medical science, a man who knows his natural philosophy and his natural sciences, when he comes to a medical school, stands a much better chance of succeeding in his school and his profession, than a man who knows his classics, and above all things, he stands a much better chance of succeeding than a man who does not know his classics, which is the general state of things in public schools. It is a sad fact to contemplate, that we all of us without exception perhaps, lost one third of our life, studying a thing which is absolutely useless to us throughout our career. It is said by the advocates of this system, "yes, but boys get a memory by doing so, it improves their memory." Yes, it improves their memory I will admit, and so would learning German, so would learning chemistry, so would learning anything else improve the memory, and yet might be much more useful to them. "Oh, but it gives them general culture, they learn poetry, and get poetic feelings," well, they learn poetry perhaps, but then they are told at the outset that there is no truth in the poetry: they are told that they are learning myths and fables, and really as far as poetry is concerned, they can learn poetry in a living language. We have our classics, Germany has her classics, if poetry is a necessity in the education of man. We have our Maclises, our Millais, our Hooks and our Turners, let them learn poetry out of their works, and save their brains for better things than dead languages. Dead languages are well enough for those who have to study dead things, but for those who have to study living things, depend upon it, it would be much better to study living languages. However, that is not so yet, and therefore all you can do who come into a medical theatre for the first time, is to make yourselves acquainted as far as you can with the natural sciences put before you. You see

it has been by the study of physics and natural science that medicine has progressed in the aggregate; so in each of your minds it will be by the study of these sciences that medicine will derive benefit. You may go into the world, and you may practice your art as well as it is known at present, with very great credit, perhaps with a minimum of knowledge, but if you want any of you to do good to the future, if you want any of you to leave marks upon your profession, you can only do it by having great stores of knowledge. You start now perhaps somewhat late in life, to commence storing up that knowledge, but do not forget that the duty is before you, and you must do it if you would succeed. It is a pity that the years that are past, have not been turned to that purpose, but they have not been turned to that purpose, and therefore now you must take heart and succeed. Remember that Sydenham was nearly forty years old when he turned his attention to medicine, and yet he wrote so that he has left an impression on it, from that day to this, that he has done more than any other man ever did solely and unaided. Remember that you are much younger than he was, that you have your time before you, that you can learn now, and mind that you do make the best use of the opportunities which are thrown in your way, not only to learn the science of medicine, but to learn the collateral sciences, which are necessary for its practice as well as for its improvement. You all of you have a duty to do to yourselves, your fellow men, and likewise to your profession. You have to improve your profession, and any man who lives and dies in his profession without having done some little thing to improve it, has lost an opportunity which he might have used. Depend upon it, gentlemen, we must turn our attention stedfastly and earnestly to the study of nature wherever we find her. Thus we can conform to

> "One rule—our lives were destined to fulfil,
> "That he who tends truth's shrine and does the best,
> "Of science with a humble faithful will,
> The God of truth and knowledge serveth best."